DUKE ENERGY INDIANA

2021 DUKE ENERGY INTEGRATED RESOURCE PLAN

NON-TECHNICAL SUMMARY

VOLUME II 12.15.21

VOLUME II
SECTIONS

2021 DUKE ENERGY INDIANA
INTEGRATED RESOURCE PLAN

CONTENTS

SECTION I
DUKE ENERGY INDIANA: AN OVERVIEW ____ 5

SECTION II
WHAT IS AN IRP? ____ 7

SECTION III
OUR PUBLIC ADVISORY PROCESS ____ 8

SECTION IV
PLANNING FOR THE FUTURE ____ 9

VOLUME II

WORKSHOPS, SUMMARIES & RELATED MATERIALS

2021 DUKE ENERGY INDIANA INTEGRATED RESOURCE PLAN

CONTENTS

STAKEHOLDER WORKSHOP #1 - NOVEMBER 10, 2020 ____ 19

STAKEHOLDER PROCESS SUMMARIZED MEETING NOTES #1 - NOVEMBER 10, 2020 ____ 49

STAKEHOLDER WORKSHOP #2 - JANUARY 25, 2021 ____ 55

STAKEHOLDER PROCESS SUMMARIZED MEETING NOTES #2 - JANUARY 25, 2021 ____ 97

STAKEHOLDER WORKSHOP #3 - APRIL 21, 2021 ____ 105

STAKEHOLDER PROCESS SUMMARIZED MEETING NOTES #3 - APRIL 21, 2021 ____ 129

STAKEHOLDER WORKSHOP #4 - JUNE 21, 2021 ____ 138

STAKEHOLDER PROCESS SUMMARIZED MEETING NOTES #4 - JULY 13, 2021 ____ 176

QUESTION AND ANSWERS LOG MEETING #4 - JULY 13, 2021 ____ 177

STAKEHOLDER WORKSHOP #5a - AUGUST 4, 2021 ____ 199

STAKEHOLDER PROCESS SUMMARIZED MEETING NOTES #5a - AUGUST 4, 2021 ____ 232

STAKEHOLDER WORKSHOP #5b - SEPTEMBER 10, 2021 ____ 235

STAKEHOLDER PROCESS SUMMARIZED MEETING NOTES #5b - SEPTEMBER 10, 2021 ____ 268

STAKEHOLDER WORKSHOP #6 - OCTOBER 27, 2021 ____ 280

QUESTION AND ANSWERS LOG MEETING #6 - OCTOBER 27, 2021 ____ 334

STAKEHOLDER WORKSHOP #7 - NOVEMBER 16, 2021 ____ 348

QUESTION AND ANSWERS LOG MEETING #7 - DEC 7, 2021 ____ 402

VOLUME II
MISCELLANEOUS STAKEHOLDER COMMUNICATIONS

2021 DUKE ENERGY INDIANA INTEGRATED RESOURCE PLAN

CONTENTS

SIERRA CLUB PETITION 6-17-21 ____ 409

STATE AND COUNTY LEADERS 8-17-21 LETTER RE DEI IRP PROCESS ____ 441

SIERRA CLUB 8-26-21 LETTER RE IRP WORKSHOP ____ 443

REPLY TO SIERRA CLUB 8-26-21 LETTER ____ 450

SIERRA CLUB 9-8-21 LETTER RE IRP TRANSPARENCY ____ 453

REPLY TO SIERRA CLUB SEPT 9-8-21 LETTER ____ 455

HEC 10-6-21 LETTER RE COAL ASH IN THE IRP ____ 459

SIERRA CLUB 10-26-21 PETITION ____ 470

SECTION 1

DUKE ENERGY INDIANA: AN OVERVIEW

BRIEF SUMMARY OF THE DUKE ENERGY INDIANA 2021 INTEGRATED RESOURCE PLAN

As the state's largest electric utility, Duke Energy Indiana provides affordable, reliable, and clean energy to approximately 860,000 residential, commercial, and industrial electric customers.

SERVING

Customers in 69 of Indiana's 92 counties

GENERATING

Facilities capable of producing 6,429 megawatts of electricity

SUPPORTING

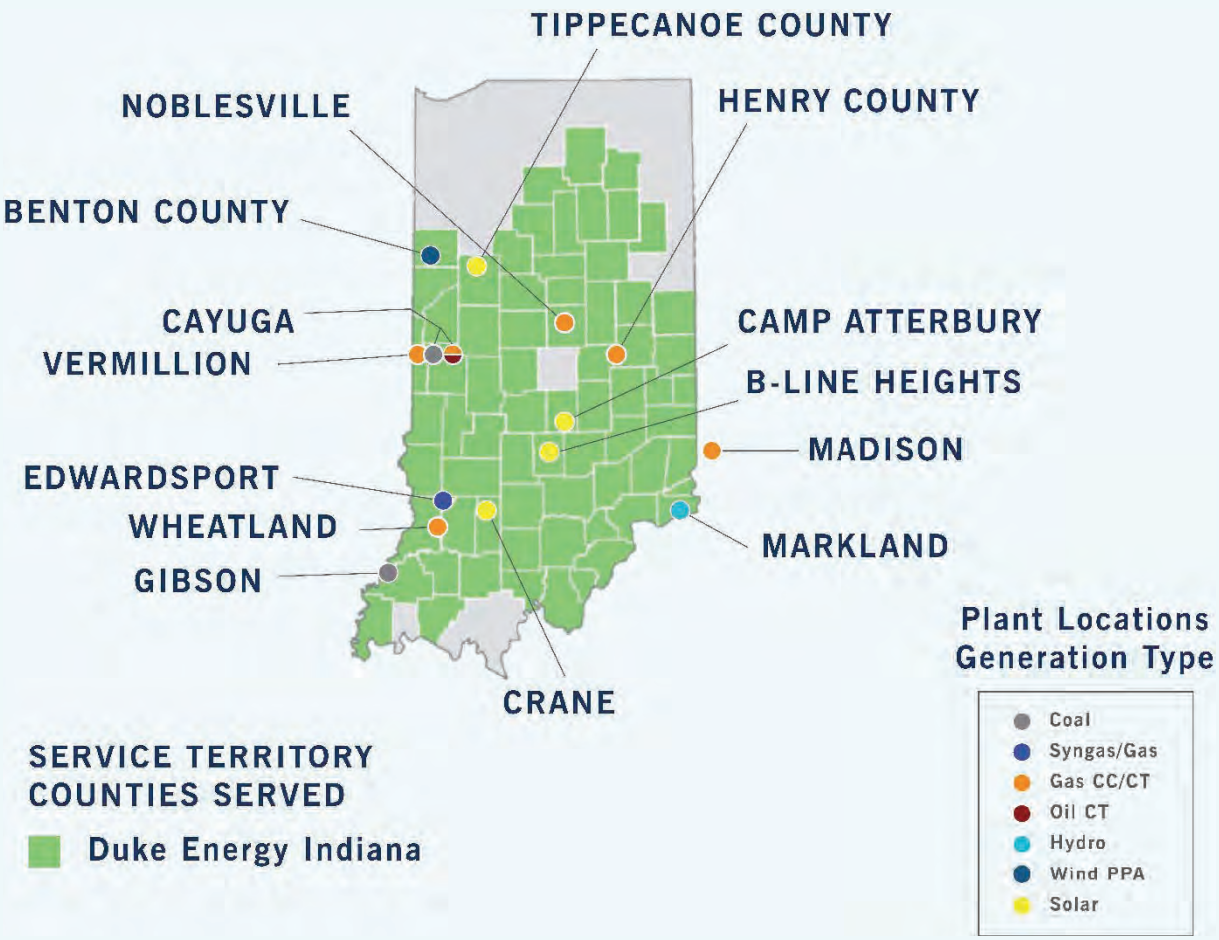
Suburban areas near Indianapolis, Ind., Louisville, Ky., and Cincinnati, Ohio, and in cities such as Bloomington, Terre Haute and Lafayette

DELIVERING

Power to our customers in a 23,000 square miles service territory

Duke Energy Indiana is dedicated to strengthening the communities we serve. We provide an essential service for a diverse customer base that relies on us to power their homes, assembly lines, pastimes and livelihoods. As such, we work hard to develop clean and efficient energy sources and to help create jobs that bolster the local economy – helping to make this state a great place to live and work.

Duke Energy has generating resources throughout its service territory to reliably serve customers in every hour of every day and is committed to transitoning the fleet in a responsible way towards a clean energy future.



SECTION II

WHAT IS AN IRP?

Duke Energy Indiana's Integrated Resource Plan is a comprehensive planning document used to forecast customer demand for electricity and our response to those needs. Our goal is to provide affordable, reliable and clean energy for our customers today and in the future. The IRP is updated and filed every three years with the Indiana Utility Regulatory Commission.

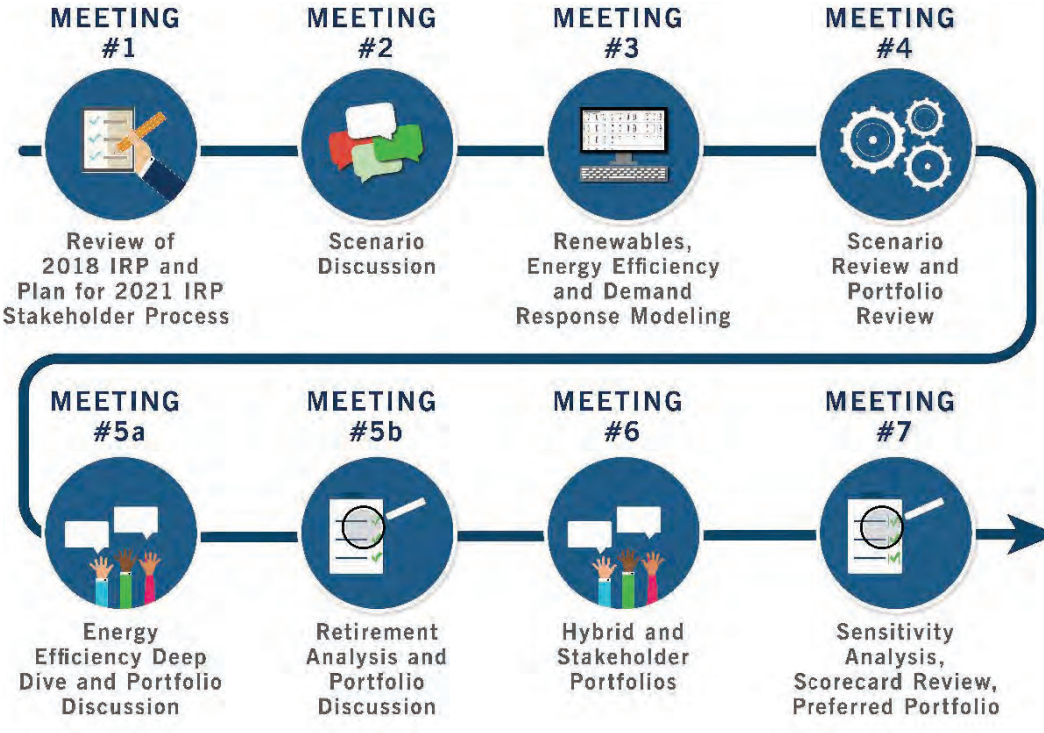
With each IRP, we use current information to keep our long-term plan updated. When it is time to make a near-term decision, we gather the best available information to analyze for that specific decision in detail at that time. This two-level approach enables us to make the best decisions today and prepare for meeting customers' needs in the future. An IRP summary document, such as this one, helps our customers understand how we supply and deliver energy today – and how we will continue to enhance our service in the future.

SECTION III

OUR PUBLIC ADVISORY PROCESS

As part of the public advisory process with our customers, Duke Energy Indiana conducted eight stakeholder meetings to gather feedback and discuss the IRP process with interested parties, as well as two customer-focused evening sessions. The eight meetings and related activities are summarized below:

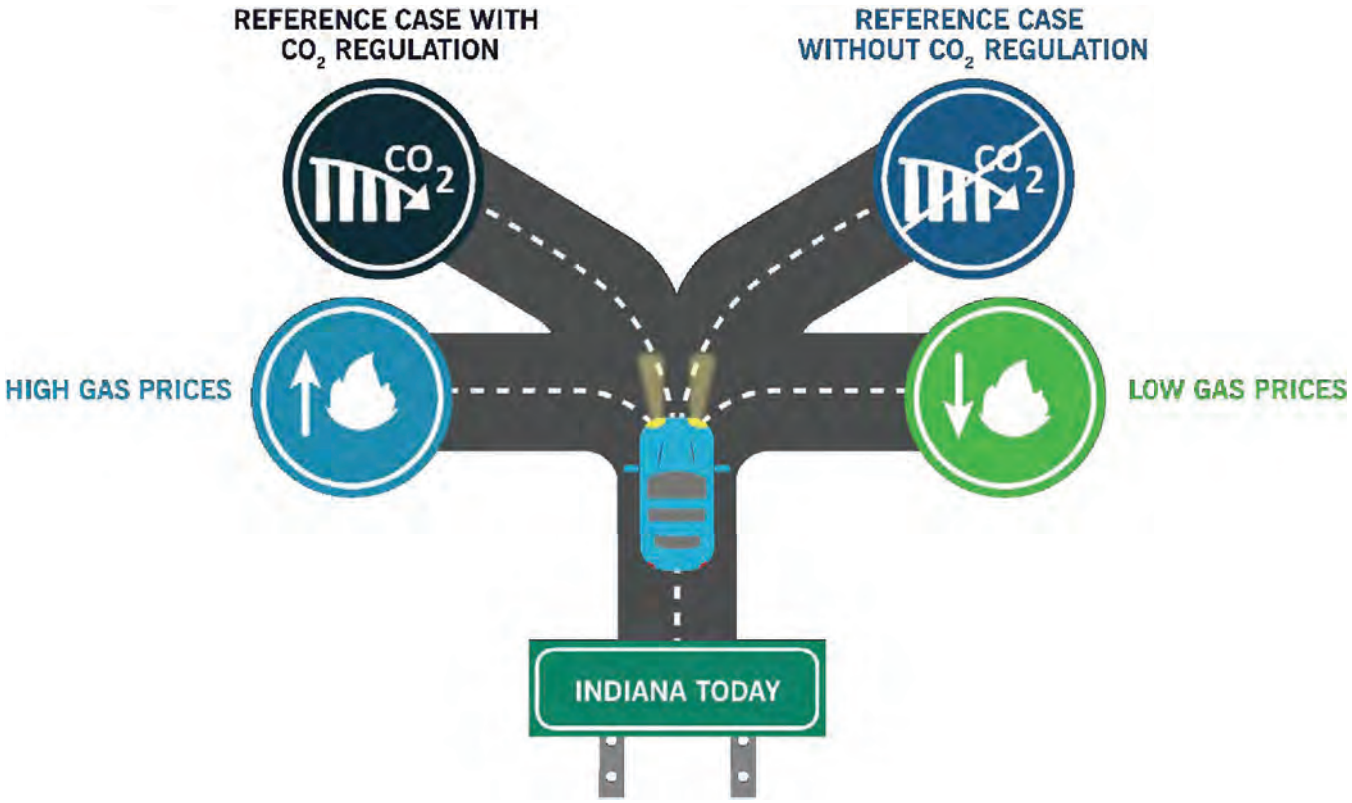
STAKEHOLDER MEETINGS



SECTION IV

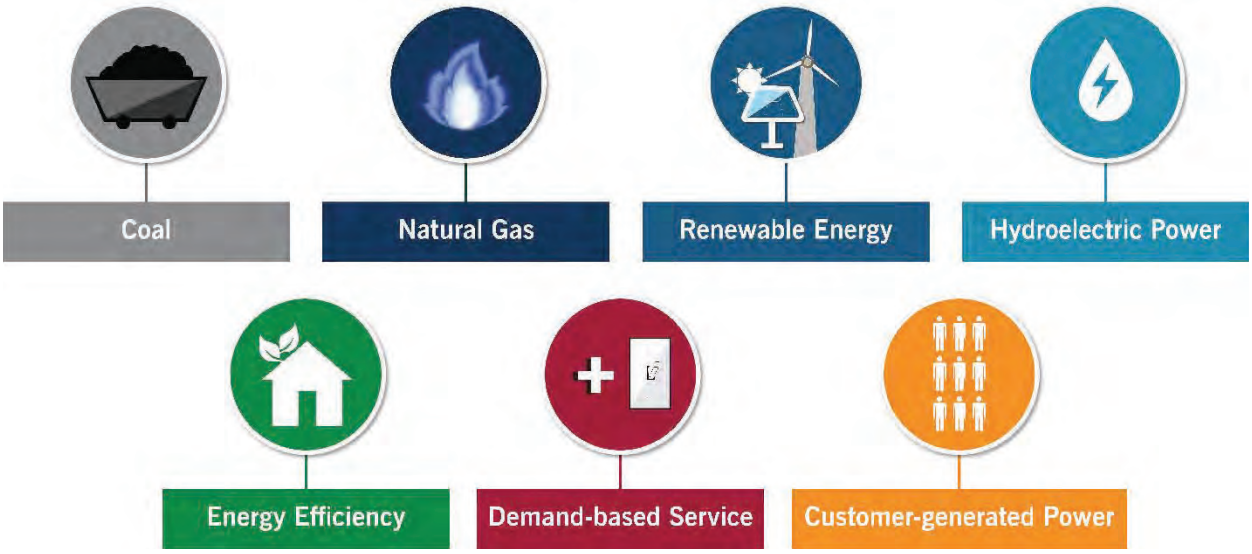
PLANNING FOR THE FUTURE

We used scenario analysis as part of this year's IRP planning process. Once we identified some key driving forces, including carbon pricing, environmental regulations, and fuel prices, we discussed those pressures in our stakeholder meetings. The feedback gathered helped us develop four separate scenarios.



RESOURCE PLANNING

We carefully consider which types of generating options we use because each source has its own set of advantages and disadvantages, ranging from costs and environmental attributes to reliability. Because customers demand different amounts of energy depending on time of day and season, our generation portfolio requires a mix of resources that provides the flexibility needed to meet varying loads.



A key part of the IRP process is to develop and evaluate different generating resource plan strategies. Once the specific modeling assumptions for each scenario were determined, a model was used to find the lowest cost portfolio of resources, or the optimized resource plans.

OPTIMIZED RESOURCE PLANS

1. Reference Case without Carbon Regulation Portfolio- most coal runs through IRP period; adds CC and almost 1,200 MW of renewables.

2. Reference Case with Carbon Regulation Portfolio- All coal retires by 2031; 2 Combined Cycles (CC) added in 2027; over 6,000 MW of renewables.
3. High Gas Prices- most coal runs until the end of the IRP period; 3,400 MW of renewables.
4. Low Gas Prices- all coal retires by 2029; 2 CCs added in 2027; 225 MW of renewable

HYBRID RESOURCE PLANS

The second group of portfolios was developed by evaluating the optimized portfolios for lessons learned as well as lessons learned from several key sensitivities. The portfolios coming out of that process are:

1. Balanced Hybrid- retires approx. half of coal fleet in 2020s; adds 2 CCs; 3,700 MW of renewables.
2. Renewables-CC Hybrid- most coal retires by 2030; adds 2 CCs; 5,500 MW of renewables.
3. Renewables CC/Combustion Turbine (CT) Hybrid (the preferred portfolio)- out of coal by 2035; adds one CC in 2027; 7,325 MW of renewables.
4. Renewables-CT Hybrid- most coal retires by 2030; adds 1,400 MW of CTs; 6,275 MW of renewables.

STAKEHOLDER INSPIRED RESOURCE PLANS

Duke Energy Indiana's stakeholders and their input were valuable elements in the development of this plan. The stakeholder collaboration and engagement process provided robust discussion and outputs – and resulted in five stakeholder derived portfolios, which

reflect the preferred resource mixes of various stakeholder groups.

1. Biden 100 - 100% CO_2 reduction by 2035.
2. Biden 90 - 90% CO_2 reduction by 2035.
3. Environmentally Focused - of out of coal by 2030; no new gas and adds renewables.
4. Reliable Energy- balanced transition of generation fleet; adds carbon capture sequestration to Edwardsport.
5. Deep Decarbonization / Rapid Electrification- significant CO_2 reduction by early 2030s and load growth due to increased electrification of the economy.[1]

2021 IRP PREFERRED RESOURCE PLAN

Based on its superior performance in scenario and sensitivity analyses, the Renewables/CC/CT Portfolio was selected by Duke Energy Indiana as the preferred resource plan. This portfolio stands out due its combination of relatively low cost, lower carbon emissions and greater resource diversity with lower exposure to energy market risk. The preferred portfolio also has the flexibility to adjust for different forms of carbon regulation, the changing economics of renewables, storage, and natural gas generating resources, and new technology like hydrogen capability or storage advancements.

As shown in the table below, the Preferred Portfolio features a measured approach with moderately accelerating coal retirements, adding of natural gas for continued reliability and progressively adding renewable generation, beginning with solar in the short term. The benefit of this Plan is the flexibility to adjust to changing market and regulatory conditions, as well as a smooth fleet transition to one that is more diverse and less carbon intensive. The

[1] The Company is still working with a stakeholder on this portfolio so the results are not included herein.

Company will issue a request for proposals (RFP) for the near-term resource needs included in the Plan – *i.e.*, solar and natural gas additions. More details on that process can be found in the short-term action plan section of the IRP.

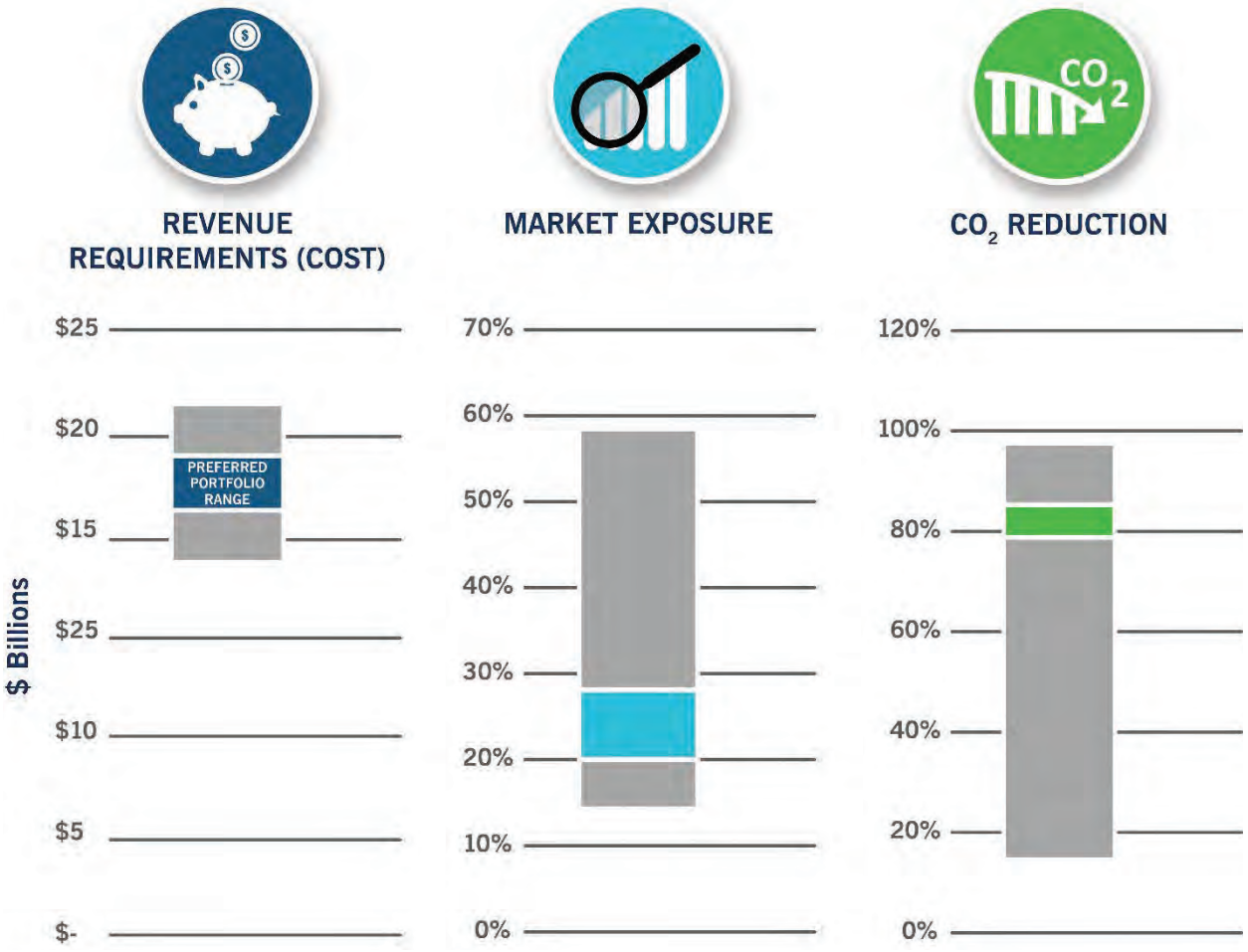
Duke Energy Indiana 2021 IRP Preferred Portfolio

	Coal Retirements	Gas Additions	Cumulative Renewables		
			Solar	Wind	Solar + Storage
2021	Gallagher 2&4 (280 MW)		47	100	
2022			47	100	
2023			197	100	
2024			447	100	
2025	Gibson 5 (313 MW)		647	100	
2026			847	100	
2027	Cayuga 1&2 (1005 MW)	CC (1221 MW)	1,047	100	75
2028			1,247	100	150
2029	Gibson 3&4 (1262 MW)		1,497	100	225
2030			1,547	200	300
2031			1,697	400	450
2032			1,847	600	525
2033			1,997	900	600
2034			2,147	1,200	675
2035	Gibson 1&2 (1270 MW) Edwardsport coal gasification (32 MW) [2]	CT (1160 MW)	2,297	1,500	900
2036			2,447	1,800	975
2037			2,575	2,100	1,125
2038			2,725	2,400	1,275
2039			2,875	2,600	1,425
2040			3,025	2,800	1,500

[2] Assumes retirement of coal gasification or implementation of carbon capture utilization and storage at Edwardsport in 2035.

In terms of performance across the four scenarios, the preferred portfolio competes well in terms of long-term revenue requirement, or cost, with lower than average energy market exposure and relatively high CO_2 reduction.

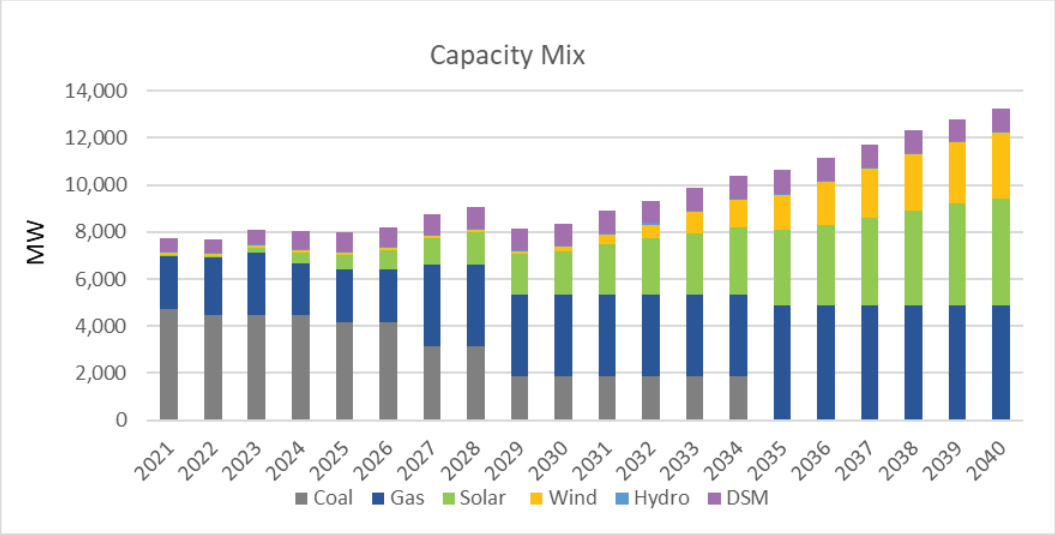
Preferred Portfolio Performance on Key Metrics



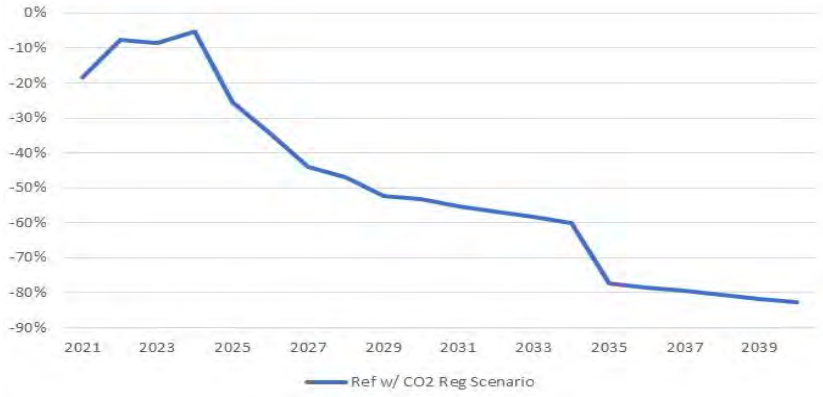
FLEET TRANSITIONS AND ACHIEVES SIGNIFICANT CARBON REDUCTION

As shown below, the Duke Energy Indiana resource plan transitions over time by retiring all coal fired generation by 2035, adding triple the amount of renewable energy from its last plan, adding moderate additions of natural gas to maintain reliability, and making significant reductions in carbon dioxide emissions.

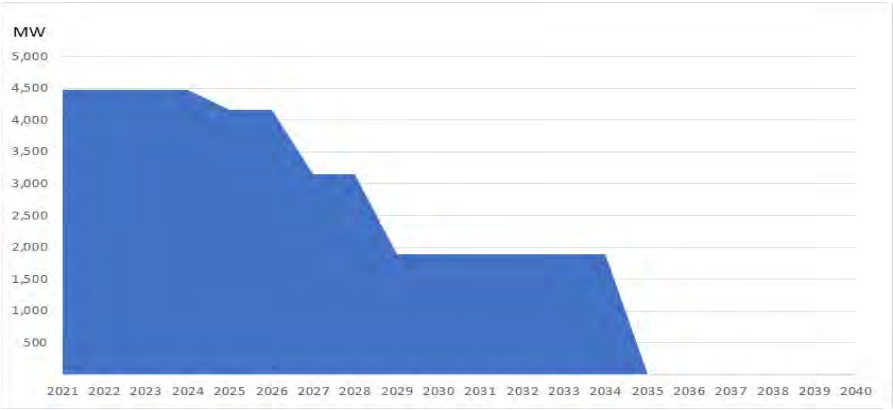
DUKE ENERGY INDIANA 2021 IRP



PREFERRED PORTFOLIO (CO_2 REDUCTIONS vs 2005 BASELINE)[3]



COAL MW IN PREFERRED PORTFOLIO



SHORT TERM ACTION PLAN

The Preferred Portfolio provides a measured and responsible approach with accelerated coal retirements, additions of natural gas for continued reliability and progressively adding renewable generation, beginning with solar in the short term. The benefit of this Plan is the flexibility to adjust to changing market and regulatory conditions, as well as a smooth fleet

[3] In the Reference with Carbon Regulation scenario, Duke Energy Indiana's Plan would reduce carbon emissions 63% by 2030 and 88% by 2040 from Duke Energy Indiana's owned generation, relative to 2005 levels.

transition to one that is more diverse and less carbon intensive.

In terms of execution, the IRP can be viewed as a foundational element that sets the strategic direction of the generating fleet. Early in 2022, the Company will be issuing a request for proposals (RFP) to gather bid information for the next phase of resources that will be added to the portfolio. The results of this process will likely be several generating projects that will be submitted to the Indiana Utility Regulatory Commission as part of the certificate of public convenience and necessity (CPCN) process. Afterwards, the Company will begin executing on approved projects.

CONCLUSION

Duke Energy Indiana's resource plan provides a path forward to an affordable, reliable, flexible and clean energy future. We're making an orderly and responsible transition to cleaner energy, while maintaining a focus on the reliability and affordability of our service for our customers.

WORKSHOPS

SUMMARIES & RELATED MATERIALS







2021 Integrated Resource Plan
Stakeholder Workshop #1

Nov 10, 2020

WELCOME

SAFETY MESSAGE

TECHNOLOGY

Microsoft-Teams check

OPENING COMMENTS

INTRODUCTIONS

Meeting Protocols

The value of this process is in participation … please jump in!

We set aside time at the end of each section for Questions, and if you need clarification at any time, feel free to ask!

”Raise your hand” for comments and questions, we will try to get to you ASAP - We will not actively be monitoring Chat

Please use your video! Not a requirement and it helps us to see who we are speaking with.

Mute mic when you don’t want to speak.

Why are we here today?

Kickoff 2021 IRP Process

- Recap 2018 IRP
- Discuss lessons learned from last cycle and improvement opportunities
- Discuss high level plan for 2021 stakeholder meetings and feedback
- Overview Load Forecasting
- Engage with Stakeholders

What are the Goals of the IRP Process

INTEGRATED RESOURCE PLAN (IRP):

DEI's plan to provide safe, reliable and sustainable energy solutions for our Customers in Indiana.

- IRPs are submitted every three years
- Plan is created with stakeholder input
- 20-year look at how DEI can cost-effectively serve our customers
- Modeling and analysis culminate in a utility preferred resource portfolio

What is a preferred resource portfolio?

> "'Preferred resource portfolio' means the utility's selected long term supply-side and demand-side resource mix that safely, reliably, efficiently, and cost-effectively meets the electric system demand, taking cost, risk, and uncertainty into consideration."

IURC RM #15-06, LSA Document #18-127
Link (PDF): https://www.in.gov/iurc/files/RM_ord_20181024141710007.pdf

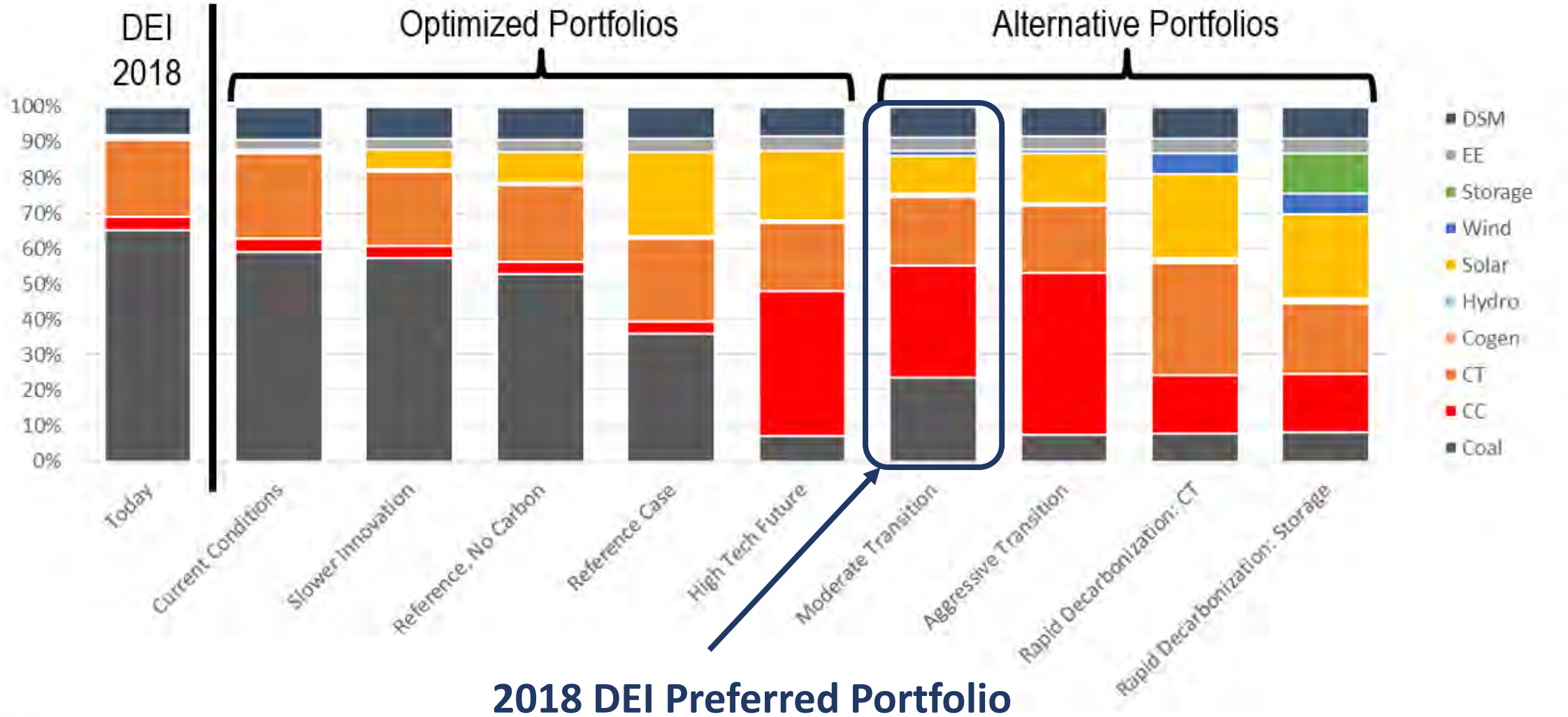
Agenda

10:00	Welcome & Introductions ✓
10:15	Review of the 2018 DEI IRP
10:45	Stakeholder feedback
11:15	Contemplated changes for 2021 IRP
11:45	Overview of future stakeholder meetings
12:00	Lunch Break
1:00	Load forecasting
2:00	Closing comments

DUKE ENERGY

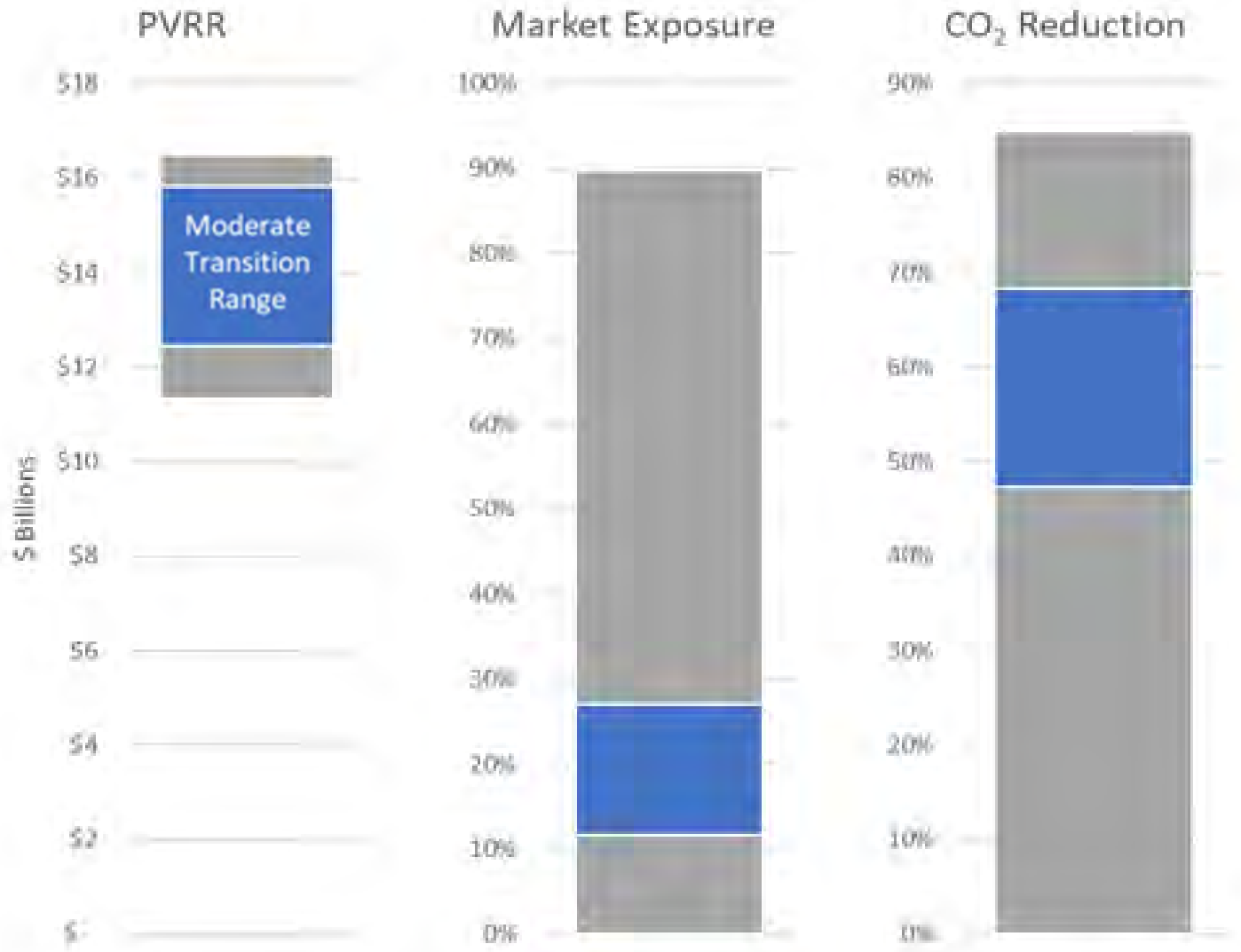
Review of 2018 IRP

Review of 2018 IRP (Capacity Mix in 2037)



2018 DEI Preferred Portfolio

Portfolio Selection Criteria



Stakeholder Feedback from 2018 IRP

Feedback	Proposal for 2021 IRP Process
More info on Load Forecast	Included in Stakeholder meeting #1 and in IRP
Source of resource information	Combination of consultant, public, RFI data
More IRP improvement discussion	Will add more description in IRP
Stakeholder meeting process	Interrupted due to modeling issue; bringing modeling capability in-house; using experienced third-party facilitator to improve process
Faster renewable deployment	Add renewables when it makes sense balancing economics, risk an reliability needs
Retirements	Model for economic retirements
Annual limits on additions	Practicality (labor, supply chain, etc.)
Reliability	Need to address since an increase in intermittent resources and a reduction in grid supporting resources will require appropriate mitigations
Level of detail in IRP & Stakeholder meetings	Higher level in meetings and body of IRP; more detail in side meetings and appendices
Increased Transparency	Priority and model change is expected to help considerably

Comparison of 2018 IRP and 2015 SH Portfolios

RETIREMENTS	TOTAL MW	2021-25	2026-30	2031-35
2015 Stakeholder Distributed Generation Portfolio	3449 MW	Gall 2&4; Cay 1&2; Gib 1&5		Gib 2&3
2018 Preferred Portfolio	3191 MW	Gall 2&4	Gib 4; Cay 1-4	Gib 3&5; Noble CC
2015 Stakeholder Green Utility Portfolio	2189 MW	Gall 2&4; Cay 1&2; Gib 5		Gib 1

SOLAR & WIND ADDITIONS	TOTAL MW	2021-25	2026-30	2031-35
2015 Stakeholder Distributed Generation Portfolio	3410 MW	970 MW Solar; 800 MW Wind	420 MW Solar; 550 MW Wind	420 MW Solar; 250 MW Wind
2018 Preferred Portfolio	2050 MW	400 MW Solar; 100 MW Wind	550 MW Solar; 250 MW Wind	500 MW Solar; 250 MW Wind
2015 Stakeholder Green Utility Portfolio	1690 MW	380 MW Solar; 250 MW Wind	300 MW Solar; 300 MW Wind	210 MW Solar; 250 MW Wind

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Contemplated changes for 2021 IRP

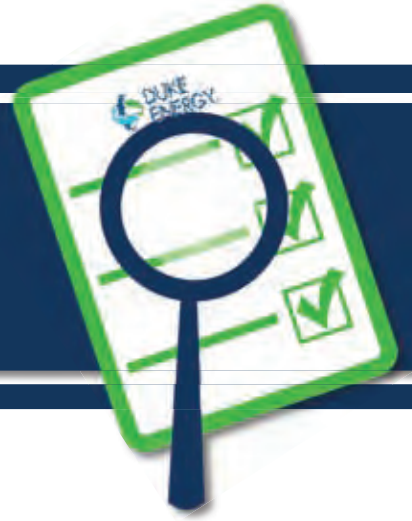
Topic	Constraints and Approaches
Change to Encompass Model	Parallel testing in 2020
Eastern Interconnect Modeling	Feedback of evolving resources impact on power prices will be modeled
Risk Driven Scenarios	Stakeholder suggestion
Source data/Confidentiality	Publicly available data / Proprietary data / NDAs / RFI
UCAP Modeling	Stakeholder suggestion
Portfolio Tool	Allows stakeholders to adjust portfolio and assess possible resource mixes to serve actual system load for historical seasonal weeks
Edwardsport Retirement Analysis	Evaluate retirement/lay-up of power plant and/or gasifier
Issue RFI	Use as alternate data source
Modeling EE & DR as sub-portfolios	Stakeholder suggestion; new MPS being prepared
DERs	Define and discuss in meeting #2
T&D Impacts	Working on scenario specific T&D impacts

Tentative timeline/topics for 2021 IRP

Meeting #/Date*	Topics
1) November 10	Introduction; Lessons learned/improvement opportunities; Load forecasting
2) Late January	Scenarios, AMI data & customer programs, DERs
3) March/April	Optimized portfolios & misc. topics
4) June/July	Modeling results; hybrid and stakeholder portfolios
5) August/September	Modeling results and sensitivities
6) October	Preferred portfolio

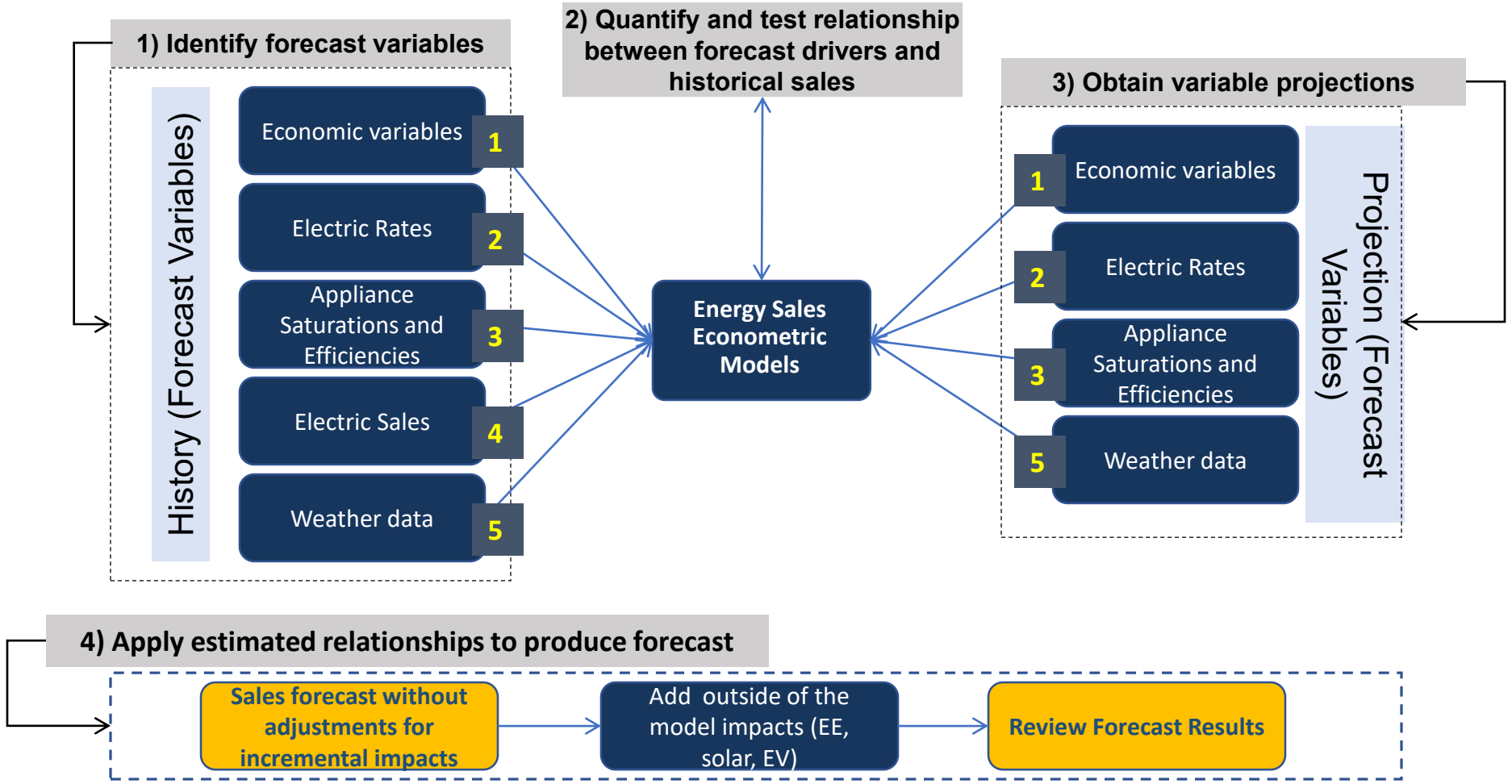
**Survey will be sent to stakeholders to provide suggestions and preferences*

Lunch



Overview of Load Forecasting

Energy Sales Forecast Methodology: High Level Process



Forecast Methodology: Energy Sales Forecast Drivers

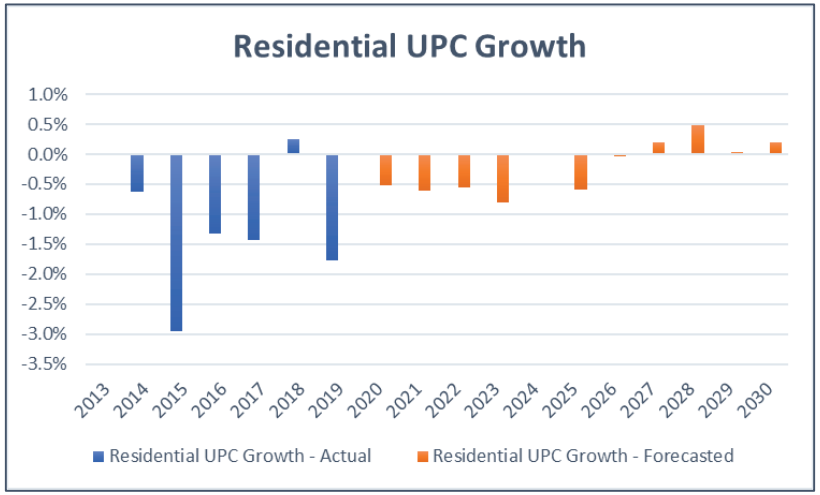
Retail Load

System Load

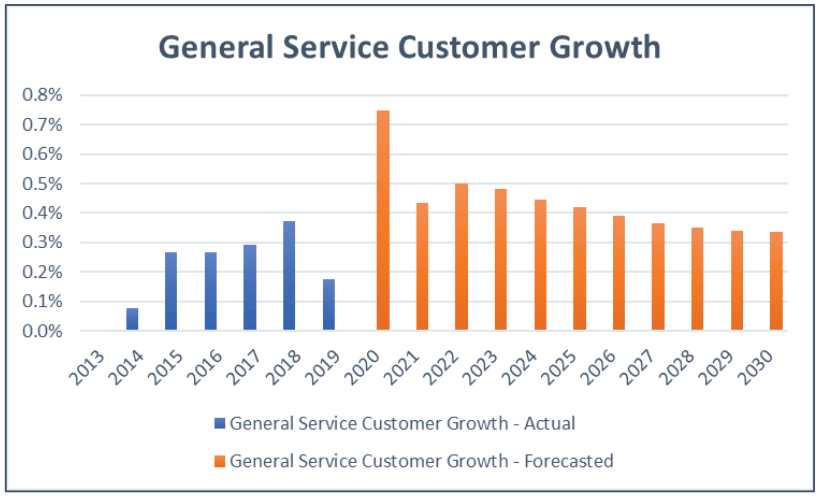
Residential	Commercial	Industrial	Government	Wholesale
• Population • Income • Rates • Appliance Saturations & Efficiencies • Weather	• Gross Domestic Product • Retail Sales • Income • Rates • Weather	• Manufacturing Employment • Industrial Production Indices	• Employment • Rates • Weather	• Contract by Contract • Retail Growth

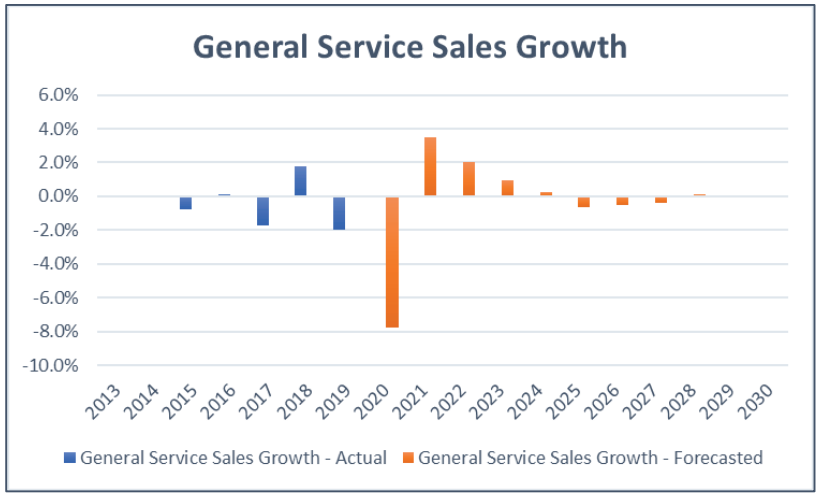
- Duke Indiana load forecast is based on a bottom-up approach (projections by customer class)
- Duke Energy uses economic, price, weather and efficiency variables to project energy sales
- The relationship between the sales drivers and energy sales is constantly evaluated

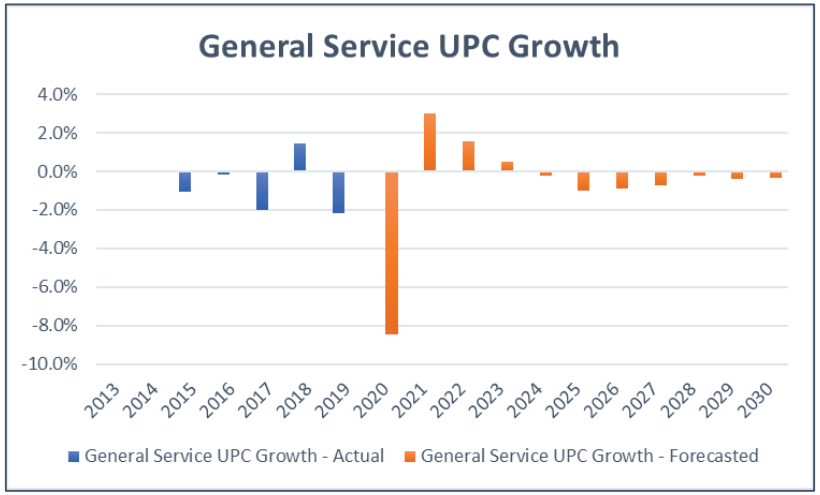
Residential



General Service

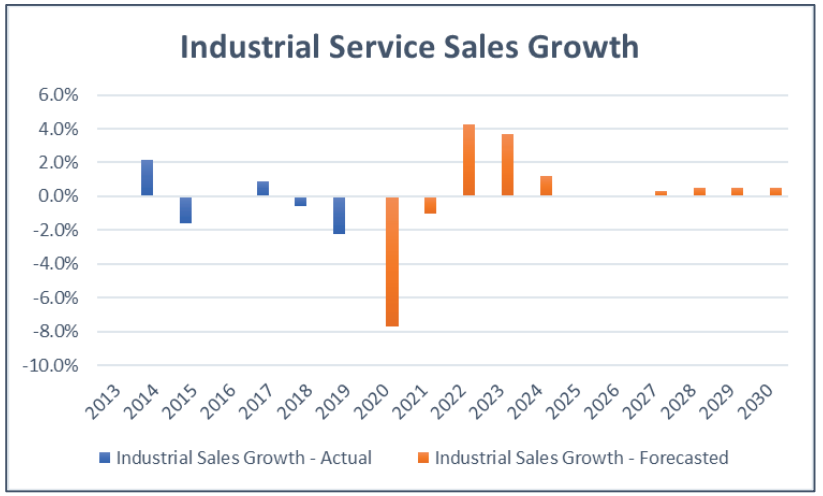


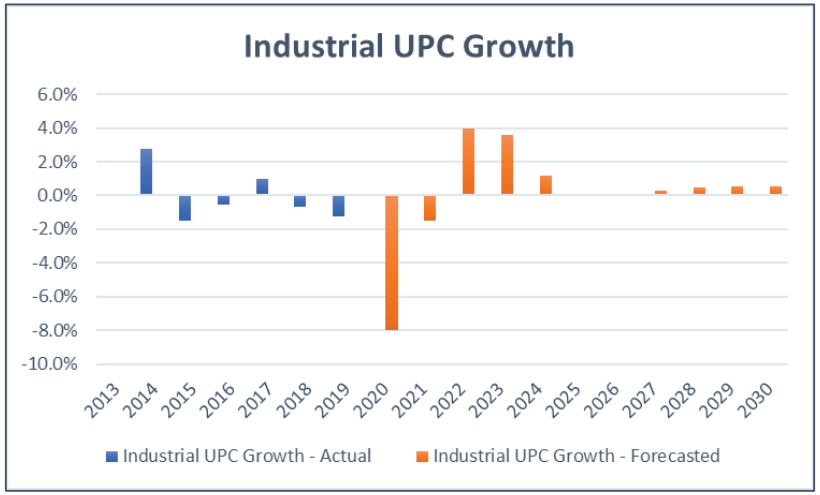




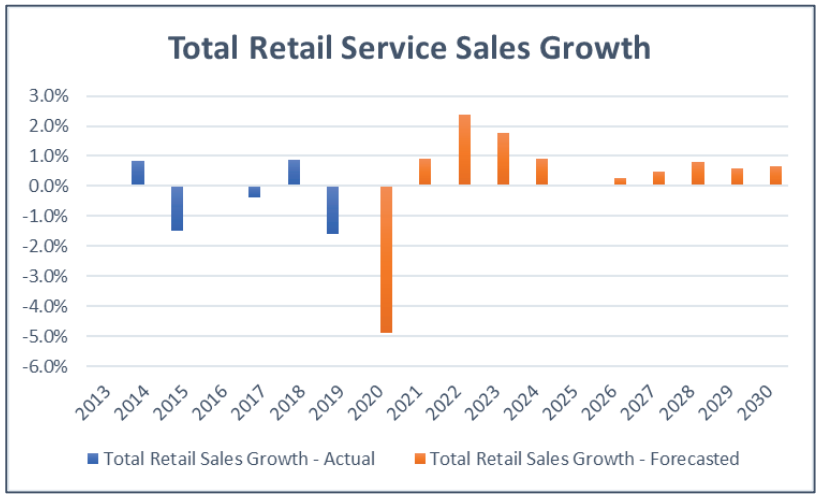
Industrial

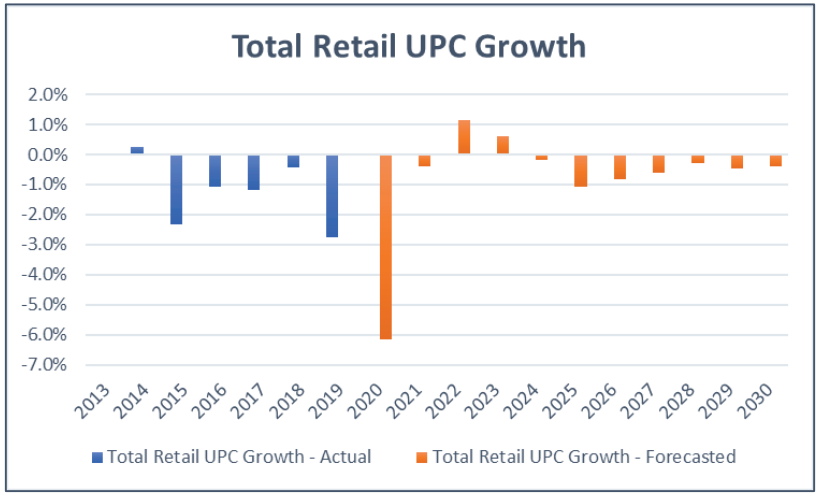

Industrial Customer Growth
0.6%
0.4%
0.2%
0.0%
-0.2%
-0.4%
-0.6%
-0.8%
-1.0%
-1.2%
2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030
Industrial Customer Growth - Actual
Industrial Customer Growth - Forecasted


Industrial Service Sales Growth
6.0%
4.0%
2.0%
0.0%
-2.0%
-4.0%
-6.0%
-8.0%
-10.0%
2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030
Industrial Sales Growth - Actual
Industrial Sales Growth - Forecasted


Industrial UPC Growth
6.0%
4.0%
2.0%
0.0%
-2.0%
-4.0%
-6.0%
-8.0%
-10.0%
2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030
Industrial UPC Growth - Actual
Industrial UPC Growth - Forecasted

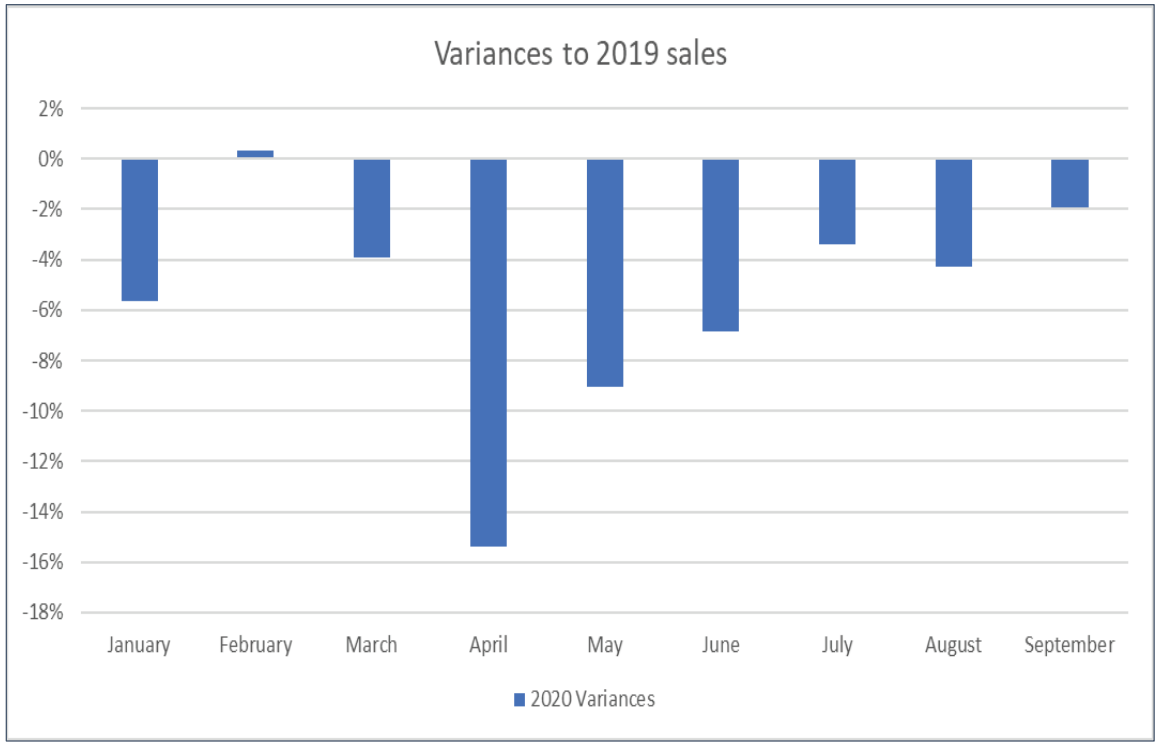
Total Retail



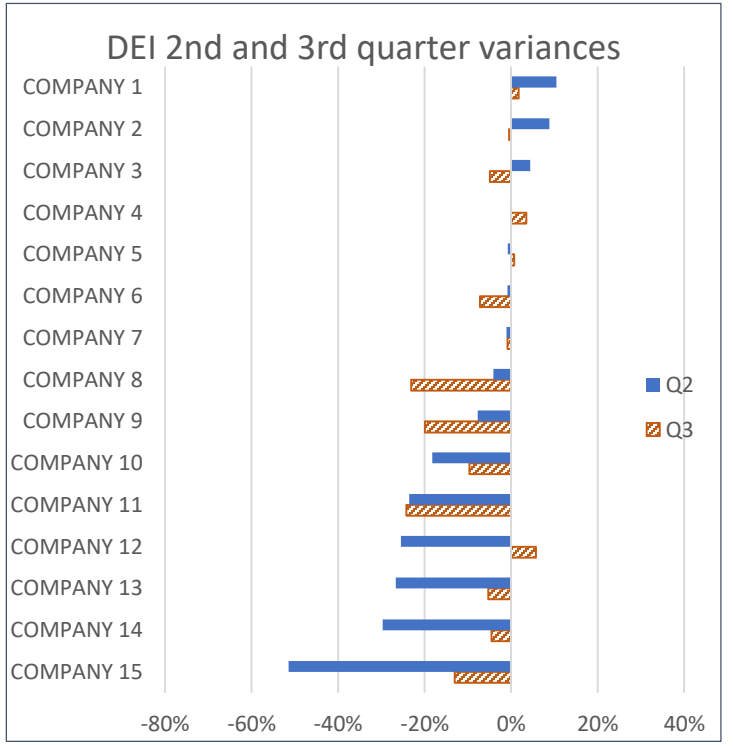


2020 Monthly Sale Variances Compared to 2019 / Covid Impacts on Large Customer Load

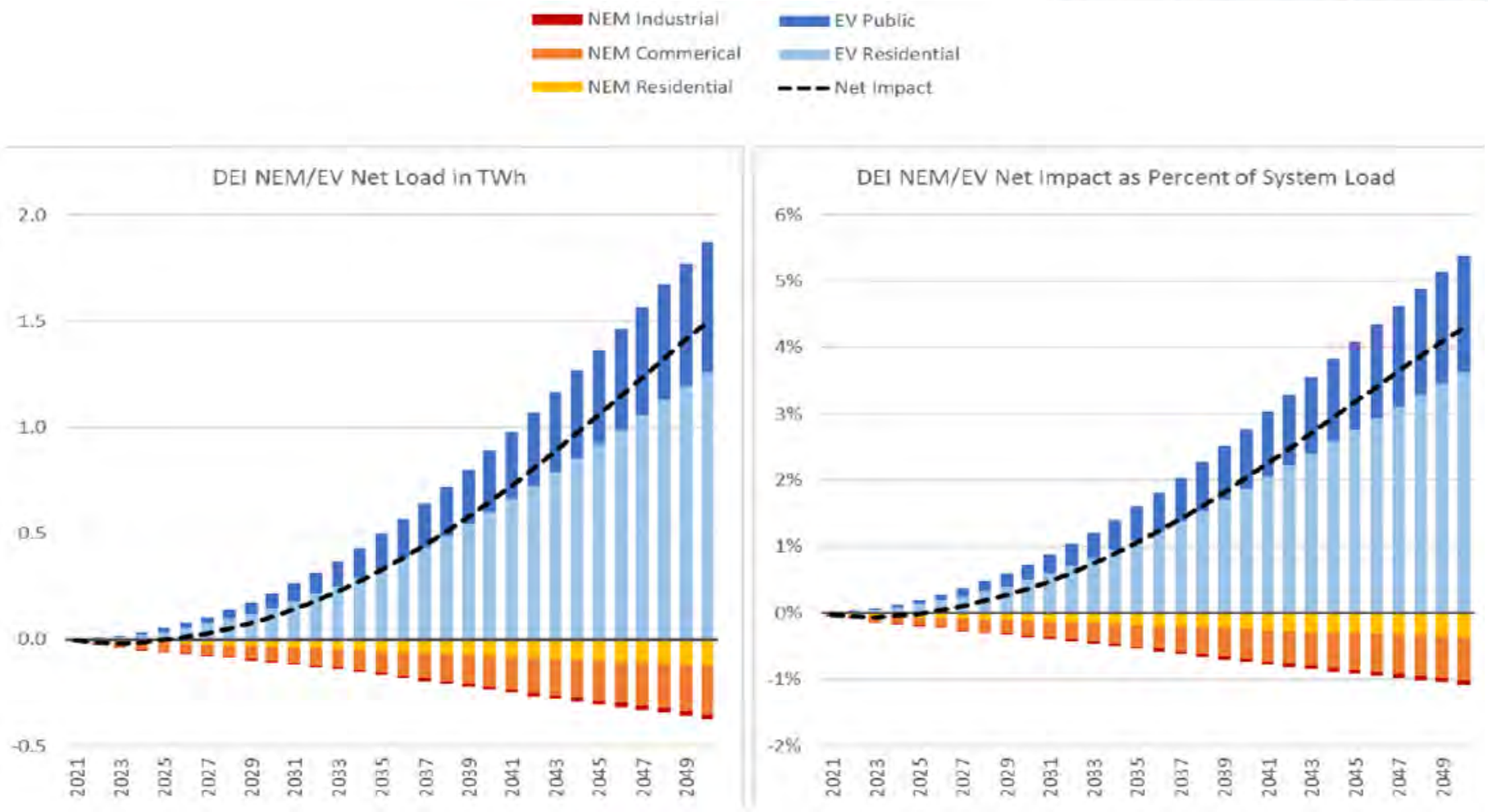
2020 MONTHLY SALE VARIANCES COMPARED TO 2019



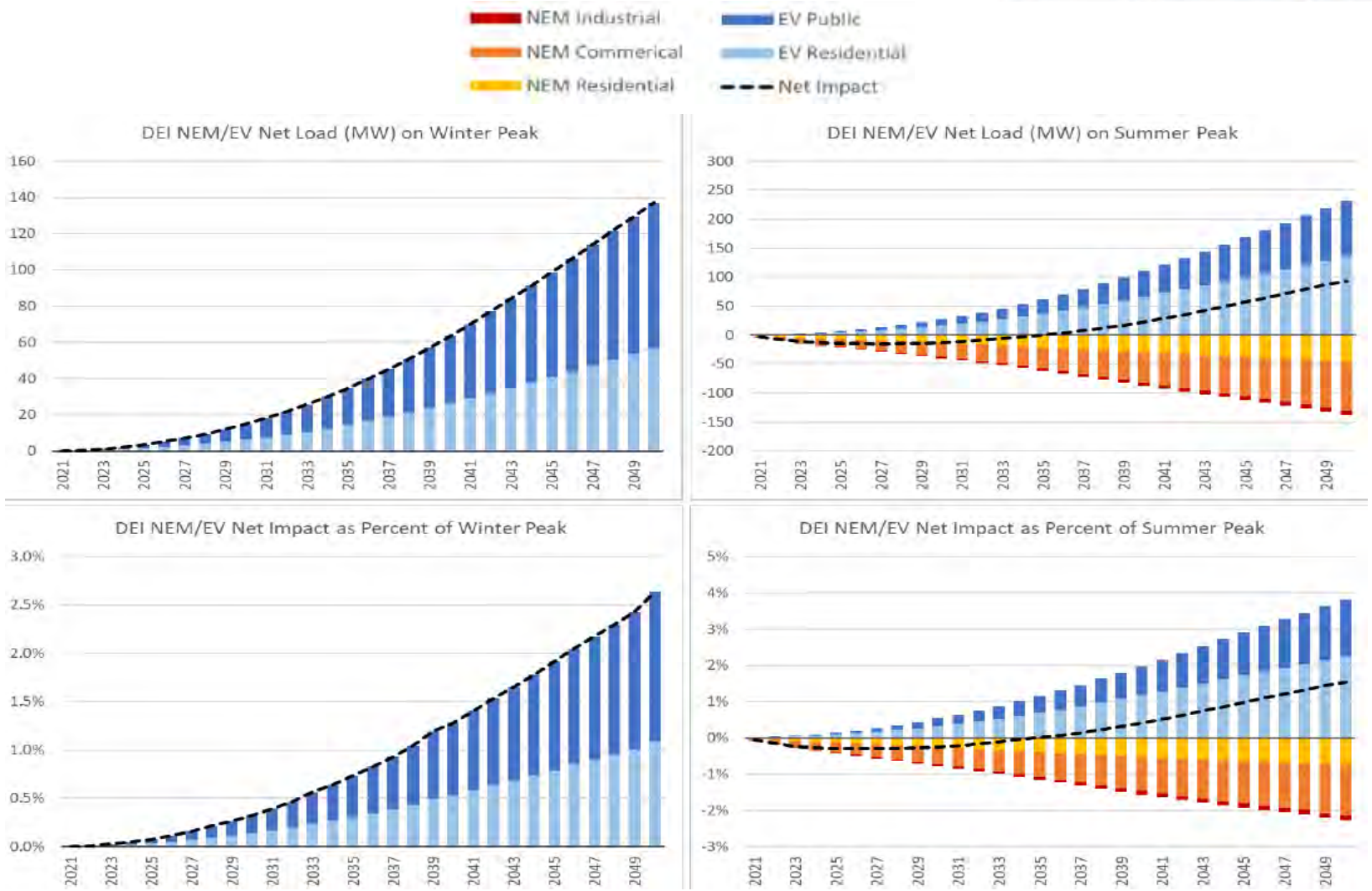
COVID IMPACTS ON LARGE CUSTOMER LOAD



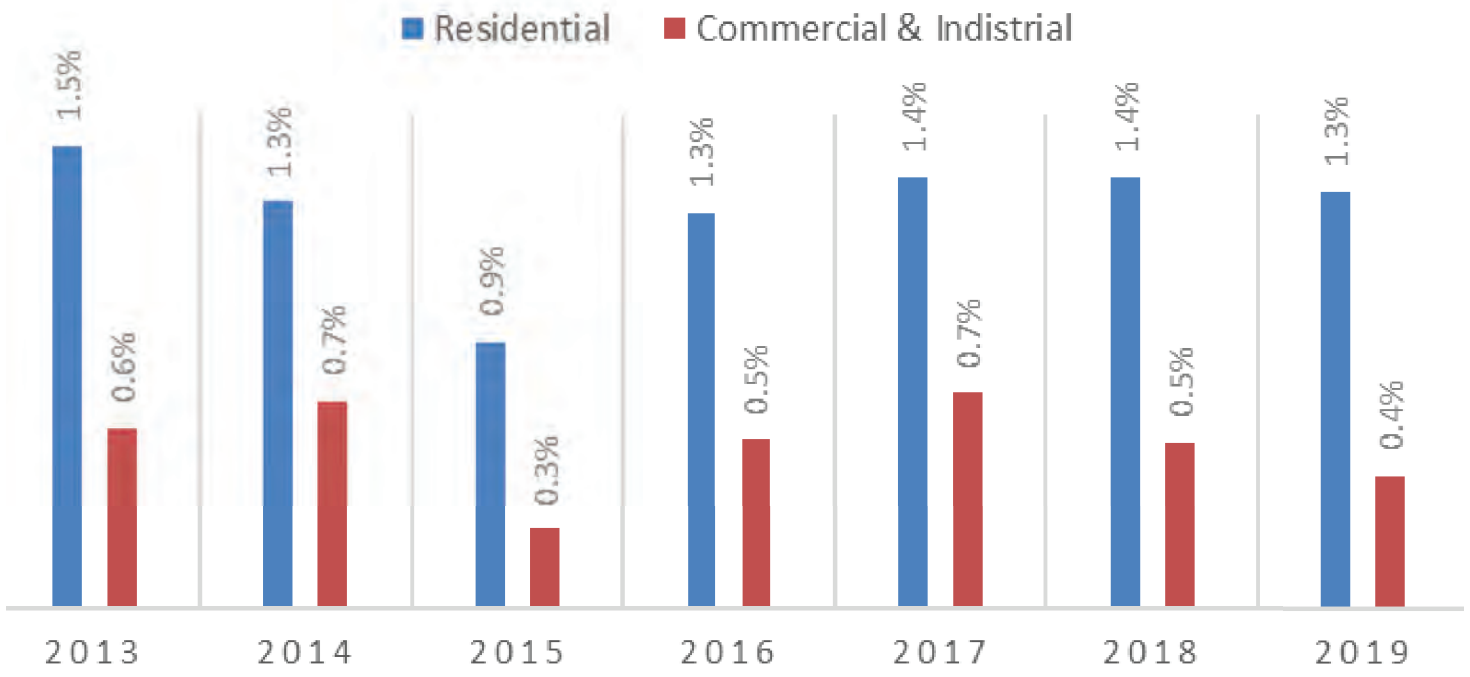
Net Impact to System Load – EV & NEM



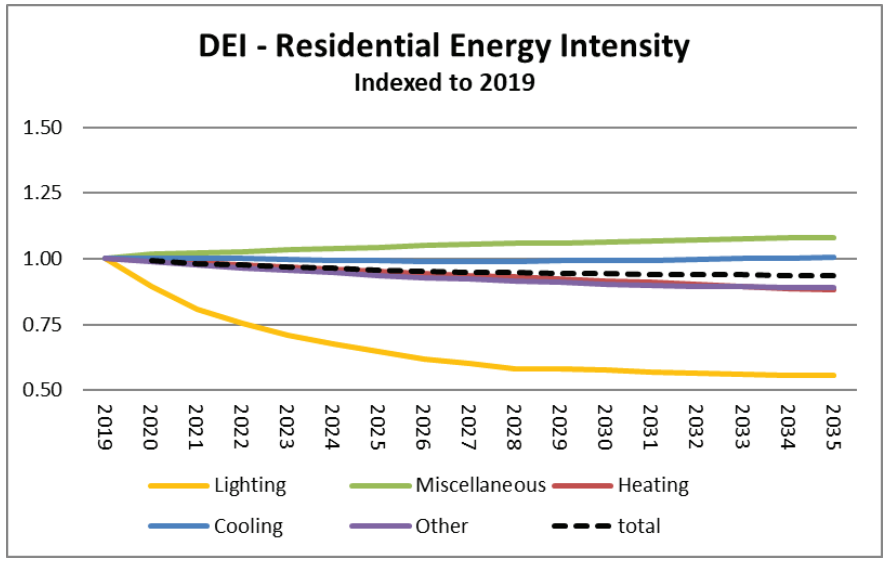
Net Impact to Peak – EV & NEM

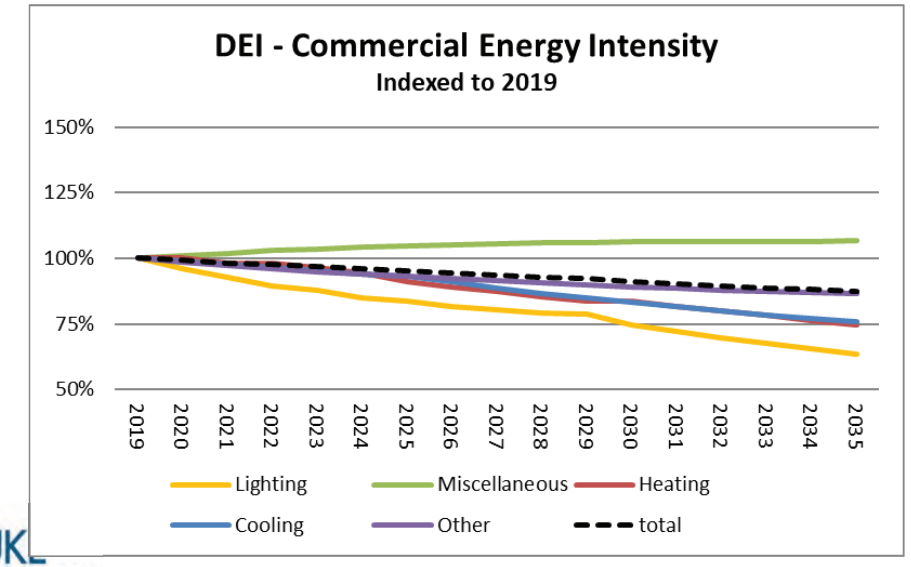


EIA Form 861 – Annual Incremental EE Savings



DEI – Residential and Commercial Energy Intensity





Heating

- Furnaces
- Heat Pumps
- Furnace Fans
- Sectional Heat

Cooling

- Central Air
- Heat Pumps
- Room Air

Other

- Water Heaters
- Kitchen Appliances
- Microwave Ovens
- Washer / Dryer
- Security Systems
- Hair dryers

Miscellaneous

- TV's, DVR's, & related equip.
- PC's & related equipment
- miscellaneous electronics
- humidifiers
- plug-ins
- digital pic frames
- pool pumps
- etc.

Moody's Forecast Assumptions

Key Assumptions:

- We assume 16.2 million COVID-19 cases and the seven-day moving average of new confirmed cases peaks at 65,363 on August 14.
- The Fed keeps the target range for the fed funds rate at 0% to 0.25% into 2023. The Fed's emergency lending facilities remain operational through the end of this year, and tapering of quantitative easing does not begin until 2021.
- The U.S. trade-weighted dollar remains strong while WTI crude oil prices remain low, hovering between $35 and $40 per barrel.
- The baseline assumes $1.4 trillion in additional stimulus, with it almost evenly split between aid for state and local governments and for unemployment insurance benefits.

Key Risks:

- A second wave of COVID-19 impacts a large portion of the U.S., causing people to self-quarantine or states to shut down nonessential businesses again.
- The next round of fiscal stimulus is delayed and/or does not include aid to state and local governments.
- Lawmakers fail to extend the expansion of unemployment insurance benefits that is currently scheduled to end July 21.
- A larger than expected wave in small-business bankruptcies prevents the unemployment rate from falling as quickly as expected.
- Financial market conditions tighten significantly.
- Political and economic tensions between the U.S. and China intensify.

Closing Comments, Stakeholder Comments

Wrap Up

- Interest level in an evening Q&A
- Meeting survey to be sent out in the next week to attendees
- Comments can also be sent to:
  - Scott at: scott.park@duke-energy.com
  - Stewart at: stewart@vanry.com
- Meeting summary and other materials will be posted on website by Nov 17th
  - https://www.duke-energy.com/home/products/in-2021-irp-stakeholder
- Next workshop expected in late January

Acronyms

AMI	Advanced Metering Infrastructure
DR	Demand Response
DER	Distributed Energy Resource
DEI	Duke Energy Indiana
EV	Electric Vehicles
EE	Energy Efficiency
EIA	Energy Information Administration
IURC	Indiana Utility Regulatory Commission
IRP	Integrated Resource Plan
MW	Megawatt
NEM	Net Energy Metering
NDA	Non-disclosure agreement
PVRR	Present Value of Revenue Requirements
RFI	Request for Information
T&D	Transmission and Distribution
UCAP	Unforced Capacity
UPC	Usage per Customer

Duke Energy Indiana
IRP Stakeholder Process
Summarized Meeting Notes
Meeting – November 10, 2020

Welcome and Introductions

DEI– welcomed the stakeholders
Review of agenda
Review of approach to virtual meeting
Introduction of attendees – Name, Organization and what their desired outcome for today is

- Facilitators
- DEI
- Stakeholders

Today is to walk through the process that will be used for the 2021 IRP

- Presenting previous IRP results, lessons learned and how we propose to work with the stakeholders for the 2021 IRP process
- Overview of Load Forecasting
- Engage with stakeholders

Goals of the IRP Process

- IRP Submitted every three years
- 20 Year look ahead
- Plan is created with stakeholder input culminating in a preferred resource plan
- Definition of Preferred Resource Portfolio per IURC Rules

Review of 2018 IRP

Scott discussed the process used in 2018 and reviewed the 2018 results
Review of what optimized portfolio means

Stakeholder question - Which of these scenarios meet corporate scenario goals?
Scott – this is a review of the results from 2018, not what we are proposing going forward
Susan Schechter -

- I suggest we use fewer acronyms and make it more accessible.
- I am alarmed that there is not enough wind in the picture.

Scott- the cost of wind is low, but the cost of transmission is higher – when we look at wind within the state transmission issues are increasing – we think a balance of wind and solar is ideal

Portfolio Selection

Scott reviewed the process used for selecting portfolios including the many factors that go into the decision. Reviewed portfolio selection criteria of PVRR, Market Exposure and CO_2 reduction

- PVRR – Low cost
- How we are different than most utilities
- We looked at MISO market and calculated the carbon based upon with market purchases
- We selected moderate for cost and risk
- These are the three criteria we will be looking at for this

Mike Mullett - How do you reconcile Duke Energy versus Duke Indiana?
Scott - Even though we are coal heavy state and utility – we are intending to get to net 0 by 2050

Tony Mendoza - is Market exposure an appropriate measure of risk? Do you have data to support?
Scott - Agreed there are a lot of reasons to discuss, market exposure certainly is one measure of risk and one that the IURC is interested in seeing

Anna Sommer - I don't want to quibble with data – but this is a moment in time analysis – but we need to see the intervening years – There is a reason to really vet the results

Jeff Haverley – what are the cumulative health effects over time? What is the corporate commitment?
Answer - We don't show health impacts – but we show emissions - we are committed to the health of the service territory

Samira Fatemi - clarify answer to Anna – is Duke agnostic to climate predictions?

Clarification - We don't know what the future holds – but we do consider the carbon tax

Anna Sommer - will climate goals be modeled?
Answer – we will work on this with you to find a way to reflect these in the analyses

Mike Mullett

- there is a distinction between modeling climate change and modeling carbon reduction
- importance of modeling emission constraints
- There should be ONE scenario that is aligned with Duke Corporate goals

Stakeholder Feedback - section

Scott discussed the specific stakeholder feedback from the 2018 IRP process and how DEI is proposing to address the feedback in the 2021 process. (see table in presentation).
Scott discussed the 2018 preferred portfolios with the results of the portfolios proposed by stakeholders in the 2015 process.

Lesley Webb – why use 2015 scenarios in 2018
Answer- We asked stakeholders to participate in putting scenarios together but were not successful

Jennifer Washburn – we did not have access to the data in the past and we are looking forward to an opportunity to collaborate

Contemplated changes section
Scott discussed additional changes that DEI is contemplating beyond those that stem from the feedback from stakeholders in the 2018 process. These include:

- Changes to the Encompass Model
- Eastern interconnect modeling to better evaluate resource impacts on power prices
- Risk driven scenarios

- UCAP modeling
- The use of a portfolio tool that will allow stakeholders to identify resource plans that they would like to see modeled
- Edwardsport retirement analysis
- The use of an RFI as input into the process
- Modeling EE and DR as sub-portfolios per earlier stakeholder requests
- Incorporation of DERs and assumptions about DER penetration
- Incorporating impacts on T&D in the analysis.

Susan Schechter –

- does rooftop energy apply as DER? Yes
- How many MW of rooftop are in production?
- The wellbeing of communities is important to Duke – I am pleased to see this – I have been distrustful of Duke
- Methane's increased potency should be considered in each of these reductions

Lesley Webb

- Carmel has just completed greenhouse gas inventory and Duke is the highest contributor – Would an all source RFI be a possibility?
  Scott - once a need is identified and RFP is used to acquire a need

- UCAP modeling?
  Scott – UCAP is a modeling approach – its aligned with MISO

Schedule section

Scott provided a proposal of meeting time frames and topics for each of the meetings. DEI is proposing a total of six meetings

- November 10 – this meeting is the only meeting in 2020. All other meetings would take place in 2021 and would be in person when that becomes possible
- Late January to discuss scenarios, AMI data usage, customer programs and DERs
- March/April to discuss optimized portfolios and other related topics
- June/July to discuss modeling results, and hybrids and stakeholder suggested portfolios
- October to discuss the final results and the Preferred Resource Portfolio

Susan Schechter – if we are able to meet in person will we still have the web functionality for people who cannot travel?
Scott – yes, we will have some form of remote participation available

Jennifer Washburn – for those of us with NDA's how soon will we see the files?
Will we get stuff in advance of the meetings?

Answer: Data will become come available at different times and will be provided as available.

John Dennis (Carmel) – we request you include the results of an all source RFP – We ask that you get rid of coal by 2030

Meghan Anderson – Its unreasonable to ask stakeholders to model their own portfolios

Scott – we would supply a dashboard tool that would allow stakeholders to identify the types of portfolio mixes that they would like to see by certain time frames. Using that input DEI would do the modeling that would produce that type of portfolio and analyze the results.

Anna Sommer- We have gone through stakeholder portfolios – We have had arguments with Duke whether things were modeled faithfully – in the most recent IRP we tried to engage – the results were unrealistic – you need to discuss this more
Scott – we understand and will work with you on these stakeholder scenarios so that you are confident that the output reflects the inputs that you wanted

Load Forecasting

DEI provided an overview model of how load forecasting is used across the industry and within DEI.

Tim Devitt – 30 years of background Predicting future customer, peaks, weather is difficult. Why not use the last ten years instead of the last 30 years?

Anna Sommer – you gave an excellent presentation of how things have emerged

- What about climate change? If we have data that indicates rapid change, is this fully factored into the forecasts

Answer - The answer is no – What we use is meteorology – there are only reliable weather - Climatology does not have the degree of accuracy.

Anna Sommer - there is the data to do it, I know it's a data issue, but I wonder
If we take as given that there will be change – can we not use that?
Factoring in ZERO impacts is a also a prediction and we know that it is wrong.

Samira Fatemi - If weather is difficult to predict – why rely on meteorological data? Why not climate? If statistical significance is important there is an argument of robustness. Statistical significance can be gamed. Why not use the Purdue research and capabilities to support your analysis?

DEI – Shortening the historical view to the last ten years may bring about an answer that is not consistent with the objectives of the stakeholders. What we have seen is that climate impacts are affecting the shoulder months and not the peaks. We are also seeing more extreme weather days in the winter. A shorter historical weather pattern that focusses on the last ten years may produce results that favor conventional generation as a response to the more extreme winters.

Scott – we will look at ways to take into consideration predictions of changes brought about by climate changes

Dr Peter Boerger Are you using load and demand the same way?

Answer – Sales and peaks are forecasted; Load factor is what we use which does not jump around

Lesley Webb - I want to echo Samara's comments to opening your mind to climate data. Basing models on old data is a fundamental flaw – I would urge you to look beyond this we are going – **please work with Purdue climate change**

Joseph Bocanegra? - Why use 30 year weather – if we use a shorter window to weight for more climate impacts

Answer – This would produce too much volatility in the forecast -

Forecast Methodologies - Michael

DEI provided a more detailed explanation of the methodology that it uses and noted that this is standard in the industry and what is expected by the IURC.

- We do bottom up and that makes us consistent with other utilities
- Every forecast is revised twice a year
- Percentage of volume – wholesale – 10 to 15 percent

Chelsea Hotaling - are you making adjustments based on COVID impacts on the upcoming IRP

Answer – we will use a revised Moody's forecast, Moody's has a COVID impact built in and I did not feel that there was a need to adjust it further

Susan Schechter – I noticed that local companies have made promises to make reductions in carbon footprint – this will impact how customers procure energy.
I don't have a good feeling about the past practices of Duke

Tony Mendoza – other utilities have committed to reduce purchase power, will you account for these in the forecast?

Answer to the extent that we know – we have accounted for these

Net Impact to System Load - Matt Kalemba

The presentation identified the expected load and energy growth by customer class over the 20 year study horizon.

Anna Sommer - are you using ITRON as your source?
Answer – ITRON is one of the sources of data

Lauren Aguilar – "This would Indicate that you are not taking managed charging into account yet?
Answer - We agree

Mike Mullett – Can we look forward rather than backward?

- FERC 2222 – Load forecasting is not a looking back
- Load forecasters are the last ones to get the word because they are not connecting with reality
- We need to look at this more organically and start to look at the revolution of IOC
- How do you look at REVOLUTION as load forecasters?

- Duke has a lot of smart people, and I am sure Duke people are thinking about this, and we are not getting
- You need to look at things differently

Answer – we are starting to look more organically at DER's and will continue to do so

Susan Schechter - Would you be interested in promoting community solar?
Answer – yes and that could be included in the results

Annual Incremental EE Savings

DEI reviewed the annual expected impacts from Energy Efficiency

Anna Sommer - This is notoriously unreliable data
We should be using ITRON

Jennifer Washburn - Energy efficiency is competing against sun and wind
The cheapest energy is the energy we save

Wrap Up

DEI asked for any additional thoughts or input

Wendy Bredhold - had requested an evening Q&A on the IRP Process –

Leslie Webb– this sounds like a good idea – most customers are not aware. Is there a way to include really reach out direct to customers?

Scott – We will look into this and see if we can set one up and if there would be interest from customers

Julie? – Surveys by email might be a good way to go

How was the meeting?

Vanry asked the participants for feedback on the meeting and if it was a useful investment in time
Leslie Webb – you did a great job – Carbon – We appreciate Duke's efforts in moving forward

Explicit Commitments from DEI to Stakeholders

DEI made several explicit commitments to stakeholders during the meeting. These are:

- We are open to discussing the market exposure
- We will show the year by year impacts – not simply the end state
- Transparency is important and an overall commitment
- We will endeavour to get information in advance – Jennifer is asking for a couple of weeks)
- Commitment to get back to Susan on whether there are plans to promote community solar
- Commitment to connect with Susan and get an audit team to her house







2021 Integrated Resource Plan
Stakeholder Workshop #2

Jan 25, 2021

WELCOME

SAFETY MESSAGE

TECHNOLOGY

Microsoft-Teams check

OPENING COMMENTS

INTRODUCTIONS

Meeting Protocols

- The value of this process is in participation … please jump in!
- We set aside time at the end of each section for Questions, and if you need clarification at any time, feel free to ask!
- ”Raise your hand” for comments and questions, we will try to get to you ASAP - We will not actively be monitoring Chat
- Video use throughout is welcome and please use your video when talking
  - Although, it’s not a requirement, it helps us to see who we are speaking with.
- Mute mic when you are not speaking.

What are the Goals of the IRP Process

INTEGRATED RESOURCE PLAN (IRP):

DEI's plan to provide safe, reliable and sustainable energy solutions for our Customers in Indiana.

- IRPs are submitted every three years
- Plan is created with stakeholder input
- 20-year look at how DEI can cost-effectively serve our customers
- Modeling and analysis culminate in a utility preferred resource portfolio

What is a preferred resource portfolio?

"'Preferred resource portfolio' means the utility's selected long term supply-side and demand-side resource mix that safely, reliably, efficiently, and cost-effectively meets the electric system demand, taking cost, risk, and uncertainty into consideration."

IURC RM #15-06, LSA Document #18-127
Link (PDF): https://www.in.gov/iurc/files/RM_ord_20181024141710007.pdf

Agenda

10:00 Welcome & Introductions ✓
10:30 Recap of first meeting
10:40 Follow-ups from first meeting
- -IRP 101 & Evening Q&As
- -Load Forecasting considering climate change
- -RFI

11:15 Scenario discussion
12:00 Lunch break
1:00 AMI, Customer Programs & DERs
2:30 Wrap up

Recap of first meeting (Nov 10)

- Review of the 2018 DEI IRP
- Stakeholder feedback
- Contemplated changes for 2021 IRP
- Overview of future stakeholder meetings
- Load forecasting

Follow ups from first meeting (Nov 10)

IRP 101 & Evening Q&As

- Due to the increase in number of new participants, an updated IRP 101 document has been added to the webpage
- Additionally, we held an evening Q&A meeting on Jan 20th

Load Forecasting considering climate change

- Based on feedback from stakeholders, we have been in contact and are working with the Purdue Climate Change Center to develop a load forecast that considers climate change

Request for Information (RFI)

- Also based on feedback from stakeholders, we will be issuing an RFI to gather information from the market. This will also act a foundation for an RFP that could be issued in early 2022
- Expect to issue around Feb 1
- Responses due around March 15

DUKE ENERGY

Scenario Development Discussion

What is a scenario?

- A scenario is a set of internally consistent assumptions that are external to the utility and beyond its control
  - Needs to include specific assumptions that can be entered into models
  - For example, carbon regulation, fuel prices, cost of new generation
- A portfolio is a set of resource additions
  - For example, build a solar or combined cycle project; retire a unit; add more Energy Efficiency
- A sensitivity is an analysis where a key variable is changed
  - Provides insight on the risks with changes in that variable

- The analysis will combine both of these efforts where we will test the portfolios across the range of scenarios which will measure the robustness and expose risks of the portfolios
- Each scenario needs to stand on its own, but a diverse group of scenarios is also important

DUKE ENERGY

Scenarios from past IRPs

ENVIRONMENTAL REGULATION

2013	2015	2018
Environmental Focus	Climate Change	High Tech Future
	Increased Customer Choice	
Reference (w/ Carbon Regulation)	Reference (w/ Carbon Regulation)	Reference (w/ Carbon Regulation)
	Clean Power Plan	
	Delayed Carbon Regulation	Reference (No Carbon Regulation)
	Repealed Carbon Regulation	Slow Innovation
Low Regulation	No Carbon Regulation	Current Conditions

Key Scenario Variables

- Carbon regulation
- Fuel prices
- Load
- Cost of resources
  - traditional
  - renewables/EE

DUKE ENERGY

Scenarios for 2021 IRP

What other scenarios/variables/risk do we want to consider/test?

DEI Scenarios

- Reference with carbon regulation
- Reference without carbon regulation

Stakeholder Scenarios

- Rapid Decarbonization & Electrification
- Current Conditions
- RFI data
- Others?

Lunch

Innovation Through AMI Data & Rate Design

Lon Huber – VP Rate Design & Strategic Solutions

Targeting System Challenges with Advance Metering Infrastructure (AMI) Insights and Rate Design

RECENT ADVANCES WITH AMI DATA

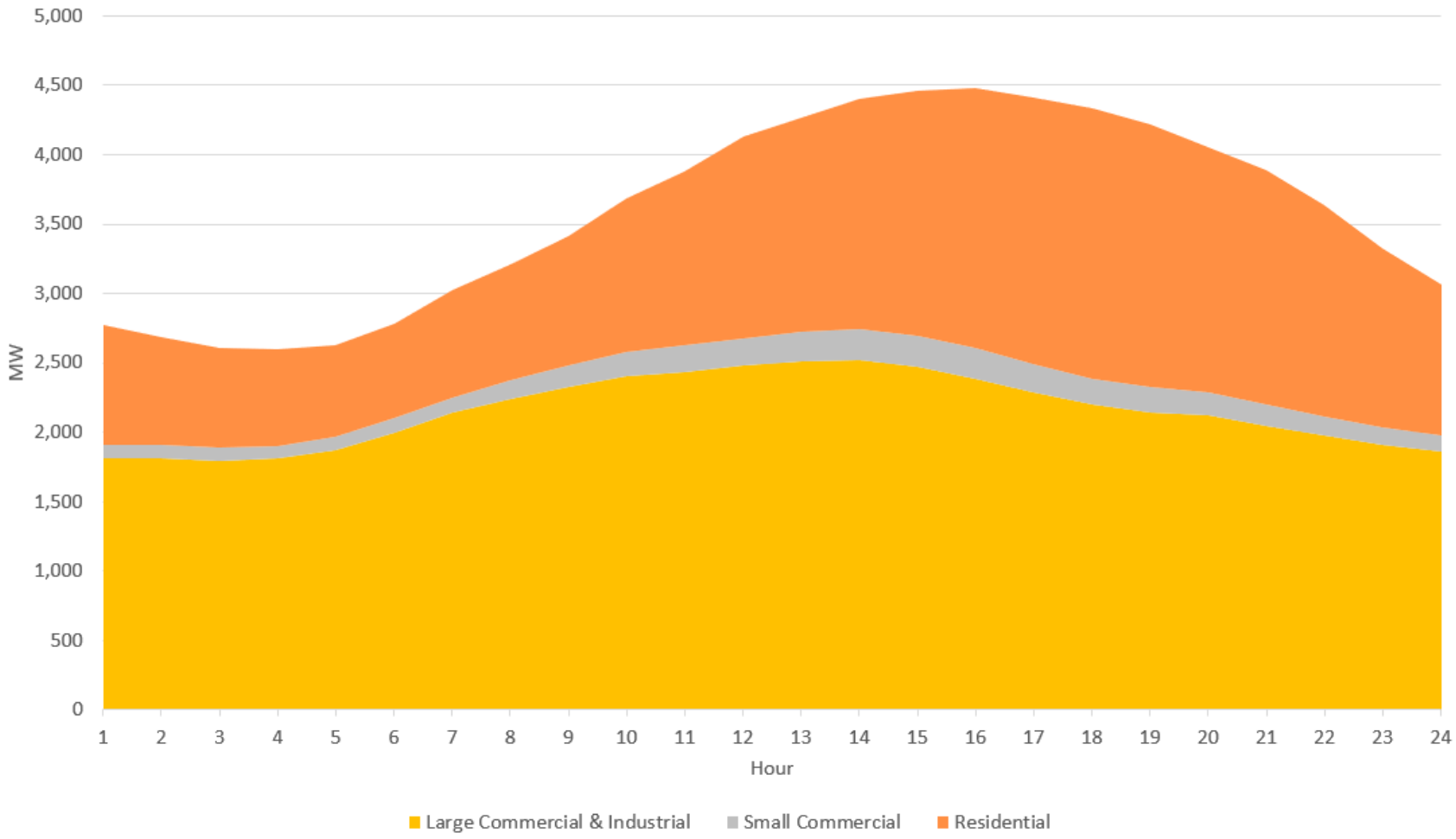
- Interval usage data available for most customers due to AMI rollout progress
- Cleaned & validated AMI data
- Reduced processing time to analyze AMI data through big data platform and data architecture

CREATING

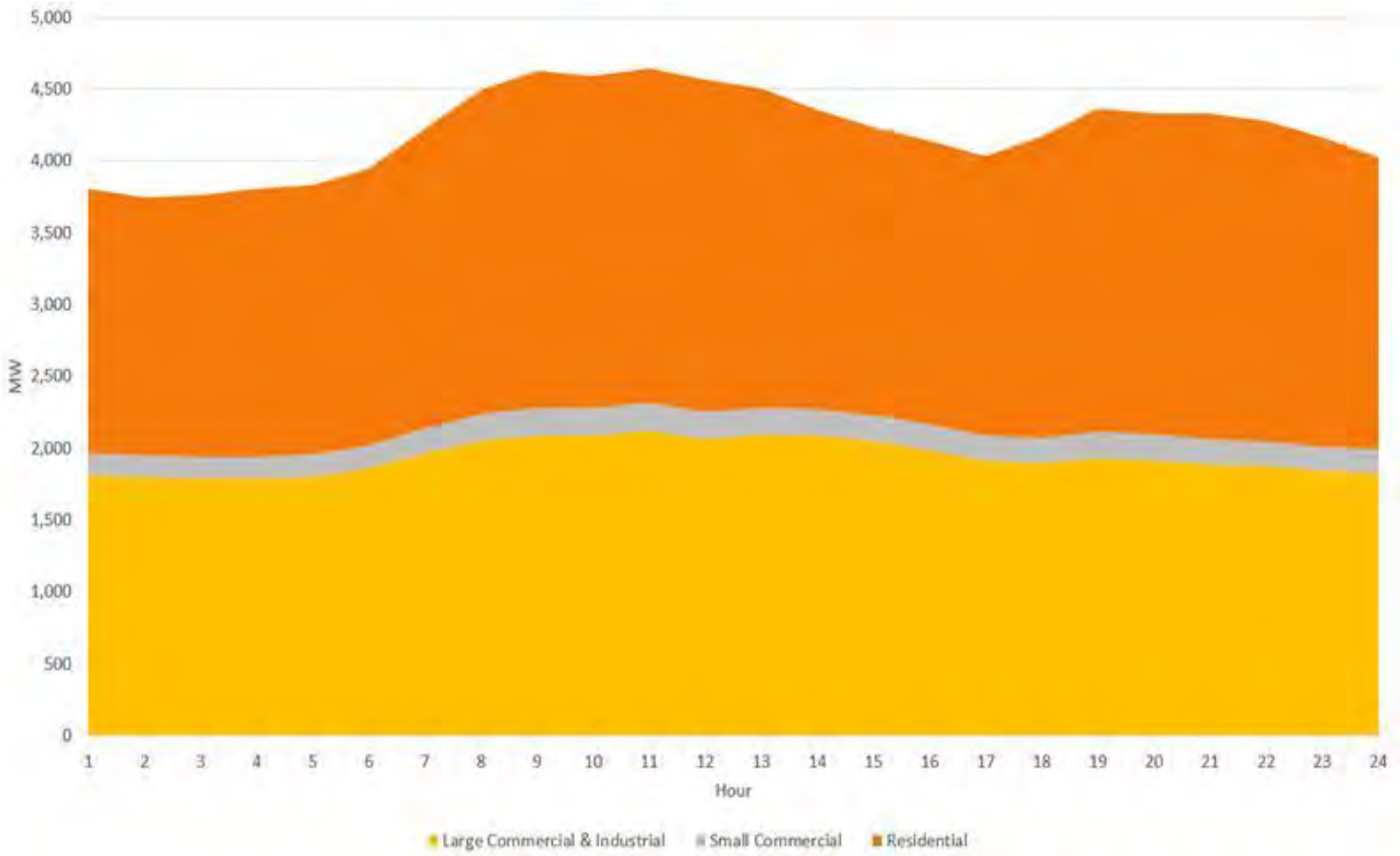
OPPORTUNITIES FOR NEW RATE DESIGNS

- Deeper insights around electricity usage by customer segments
- Enhance the way customers are segmented through the ability to combine customer AMI data with residential demographics, housing characteristics, and business characteristics
- Highlight usage patterns through user friendly interfaces and informative data visualizations

Using AMI to Target Summer Peak Loads



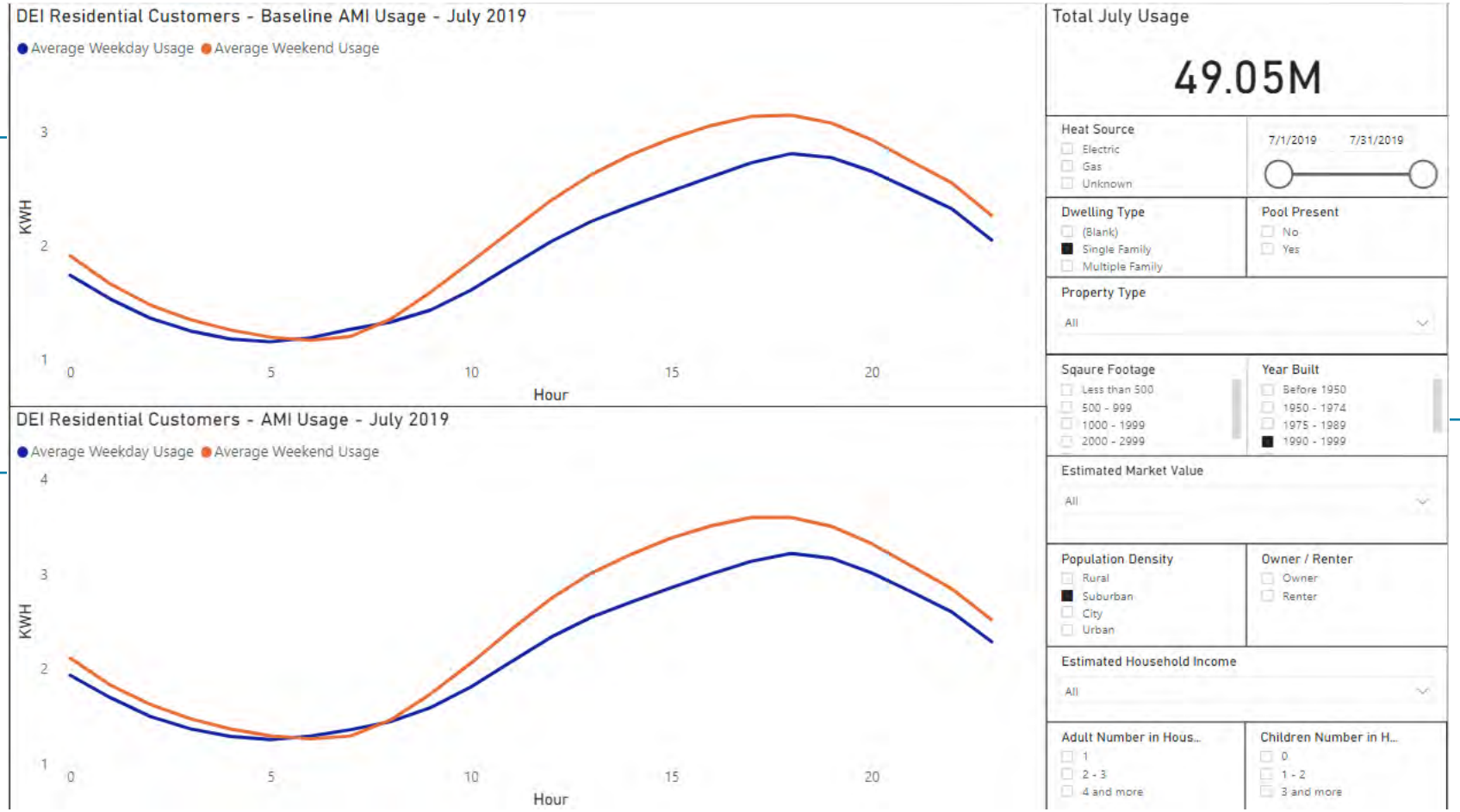
Using AMI to Target Winter Peak Loads



Pricing Team Vision - Enterprise Data Analytics Built

Hourly weekend/weekday load shapes from AMI usage data

Compare different customer segmentations

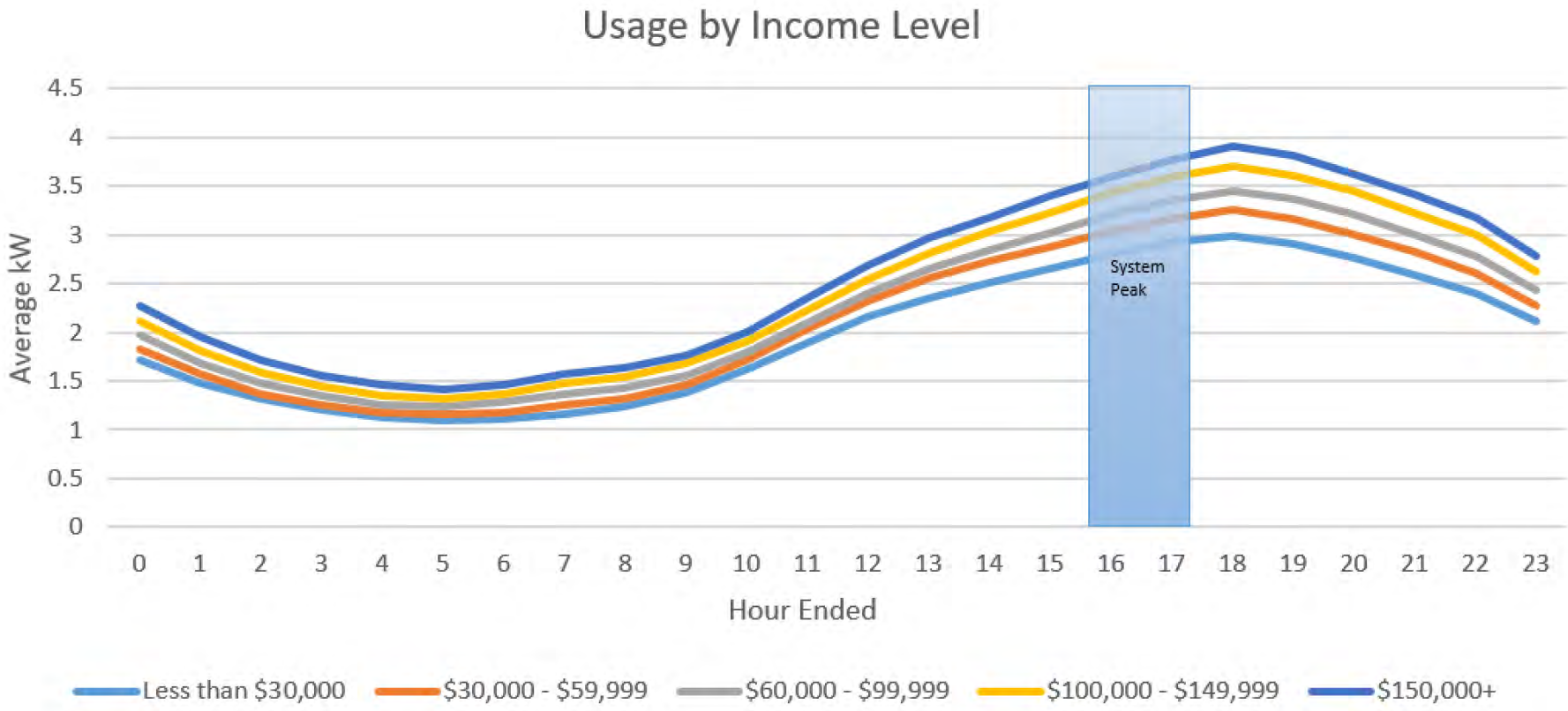


EARLY RESULTS ON THE SLIDES AHEAD

Select combinations of different customer demographics and housing characteristics

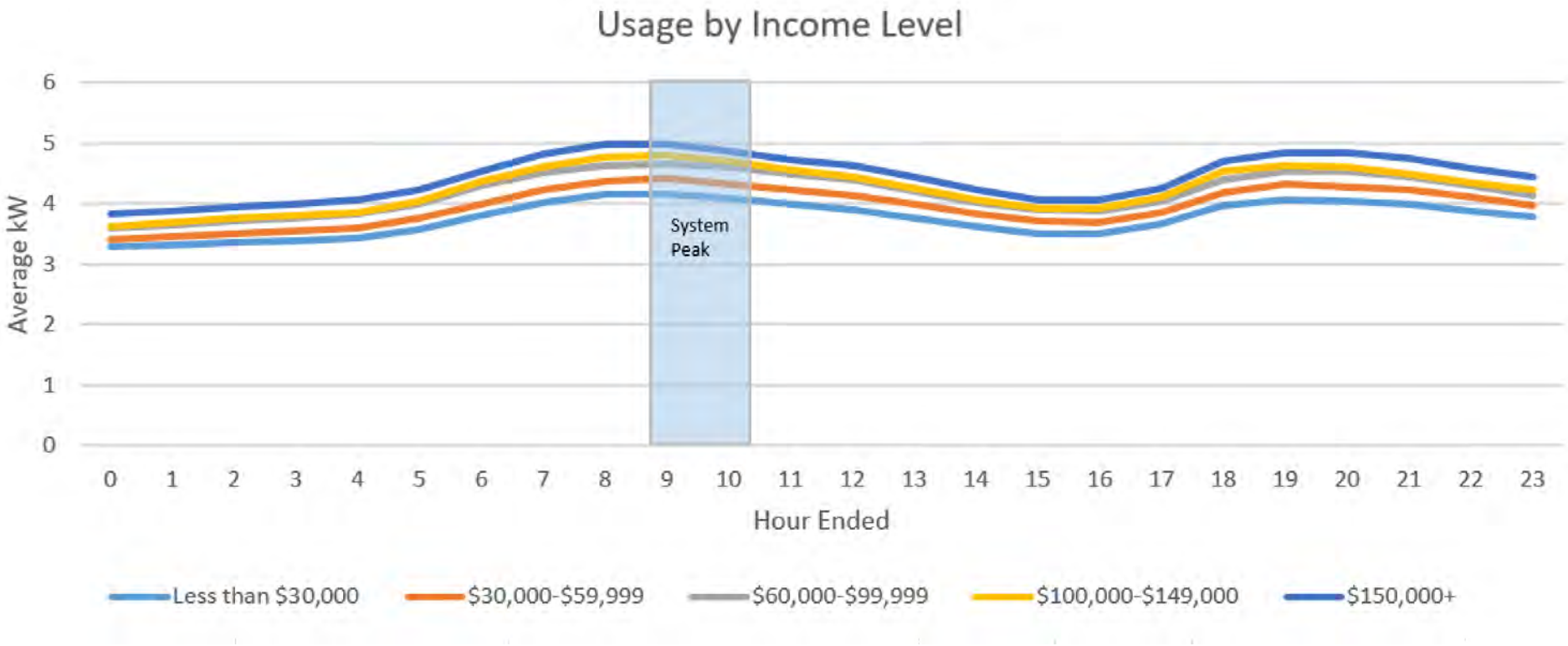
Contributions Factors to Summer peak: Income Level

- Residential energy usage during the day of Duke Energy Indiana's summer peak was analyzed



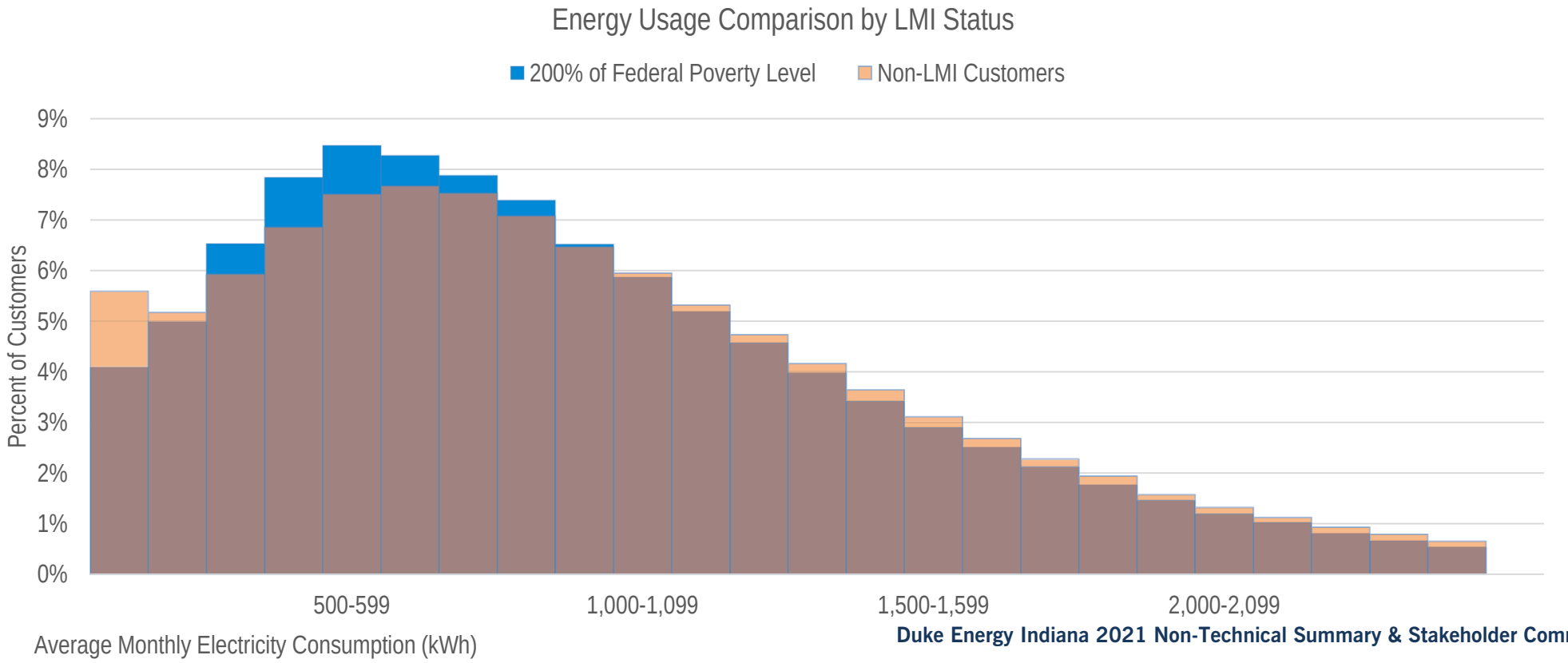
Contributions Factors to Winter peak: Income Level

- Residential energy usage during the day of Duke Energy Indiana's 2019 system peak was analyzed
- Income level, by itself, was not a driver of usage throughout the day or at the peak



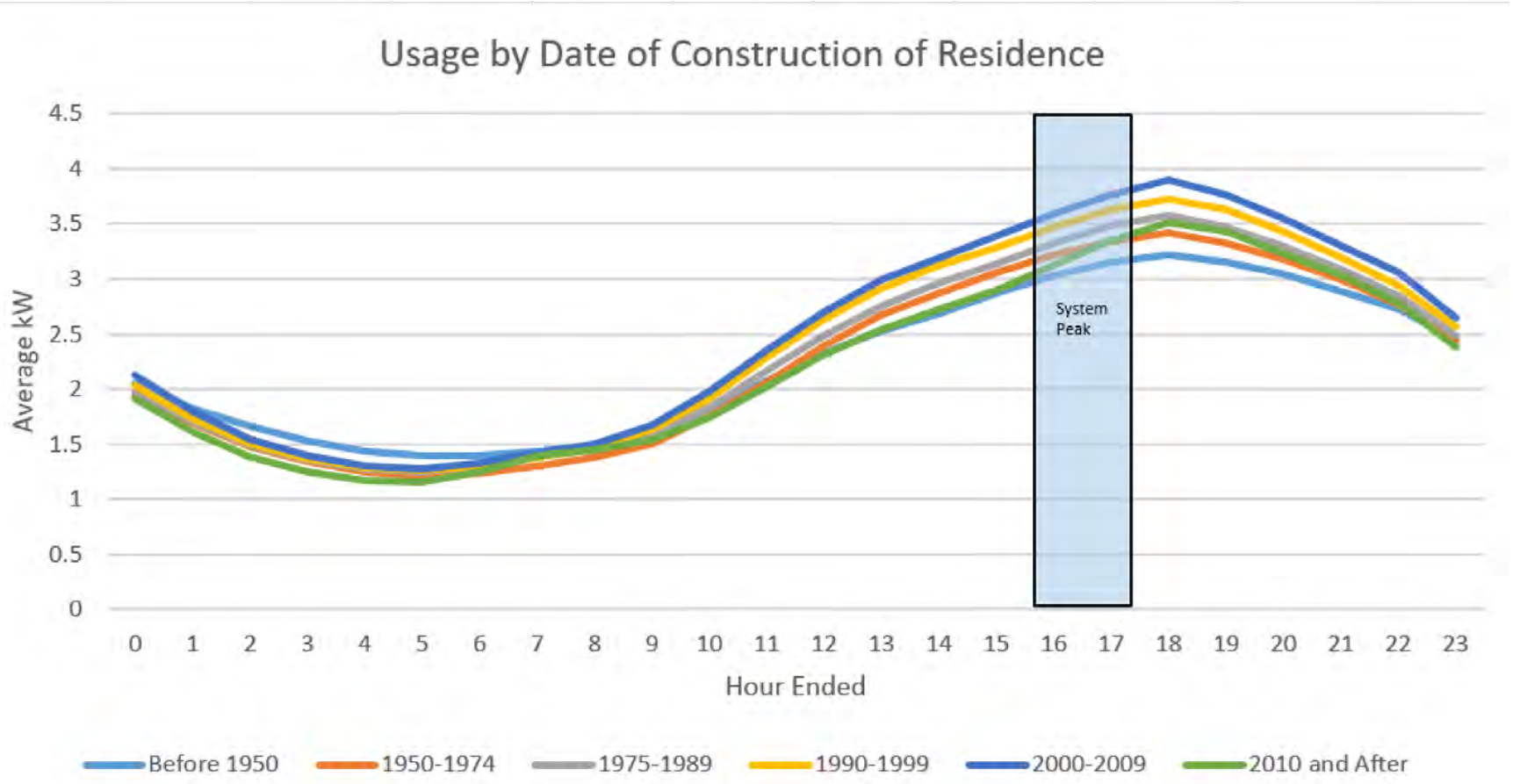
Low & Moderate Income (LMI) Customers are Nearly As Likely to Have Above-Average Usage

- Examining residential accounts in Duke Energy Indiana:
  - Small difference between LMI customers compared to non-LMI customers
    - 969 kWh monthly average for LMI vs 1,012 kWh for non-LMI
  - ~38% of LMI (less than 200% of federal poverty level) customers consume more than 1,000 kWh per month



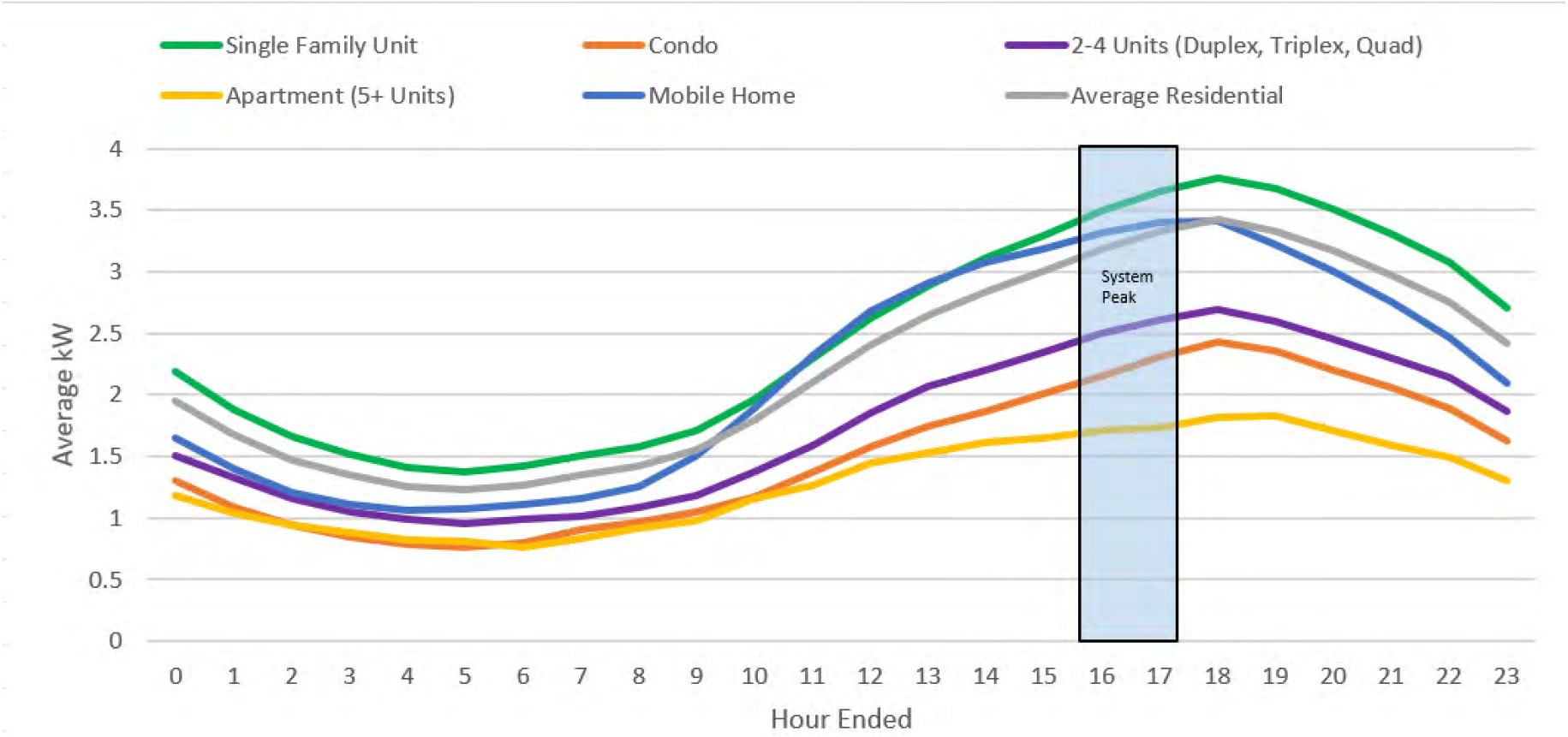
Contributions factors to Summer peak: Age of Residence

- The age of a home has as a more significant effect on contributions to summer system peak
- Homes built from 2000-2009 have the most usage and contributions to summer system peak



Contributions factors to Summer peak: Property Type

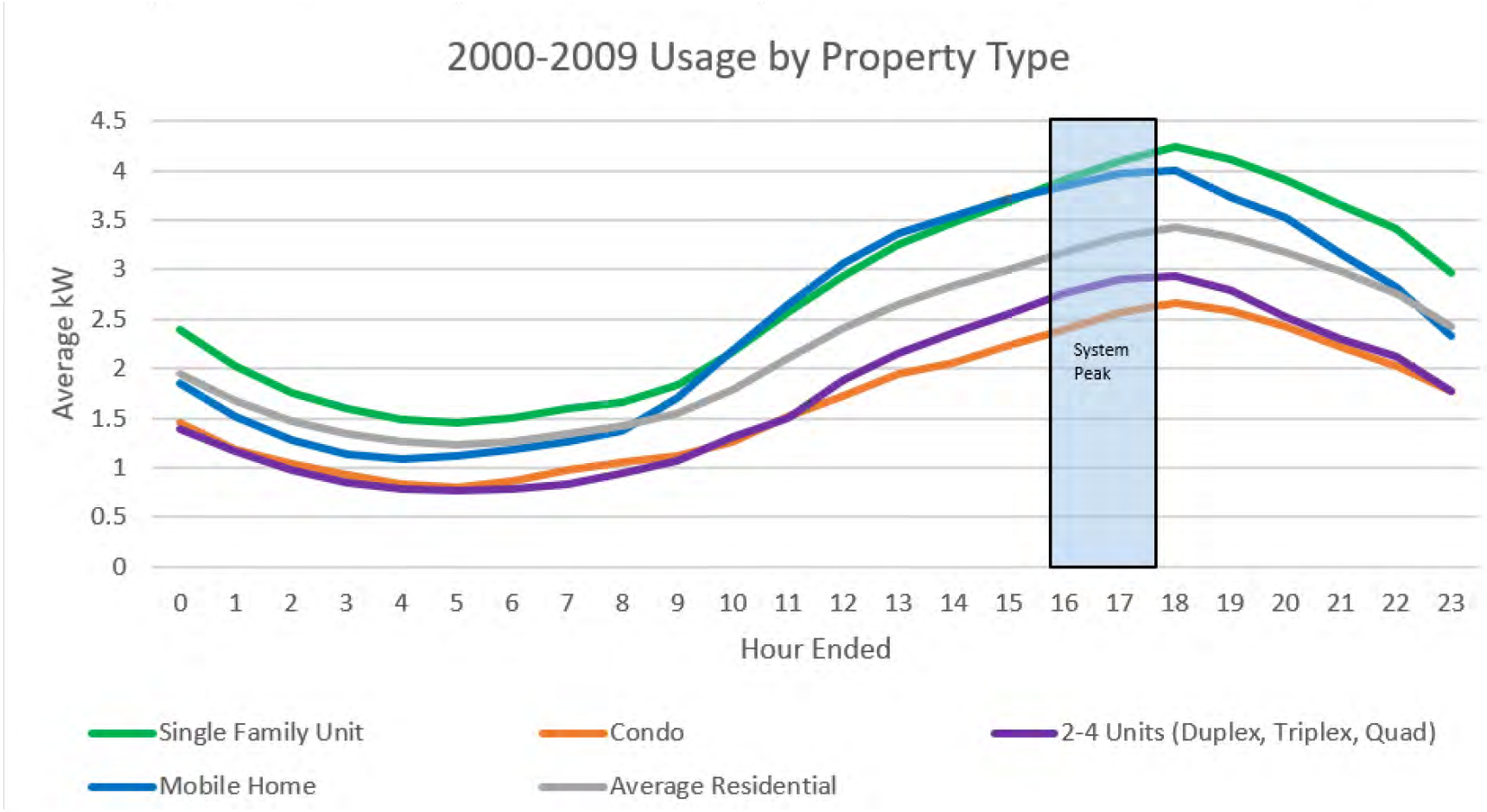
- Single Family Homes were a particularly large contributor to the summer system peak



*Excluded miscellaneous residences

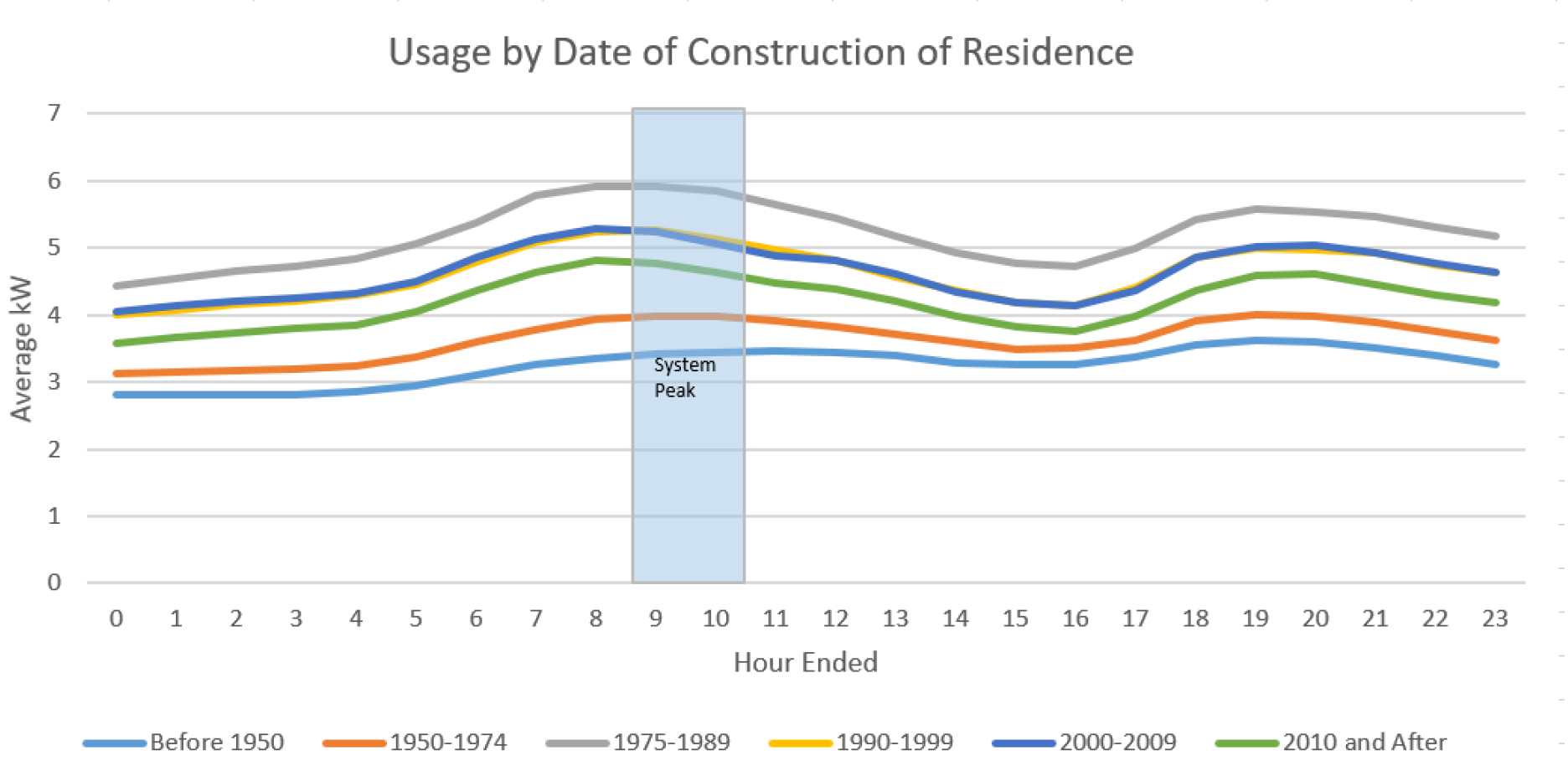
Contributions factors to Summer peak: Age of Residence 2000-2009

- From 2000-2009, Single Family Units have the most usage and contributions to summer system peak, with Mobile Homes contributing the second most



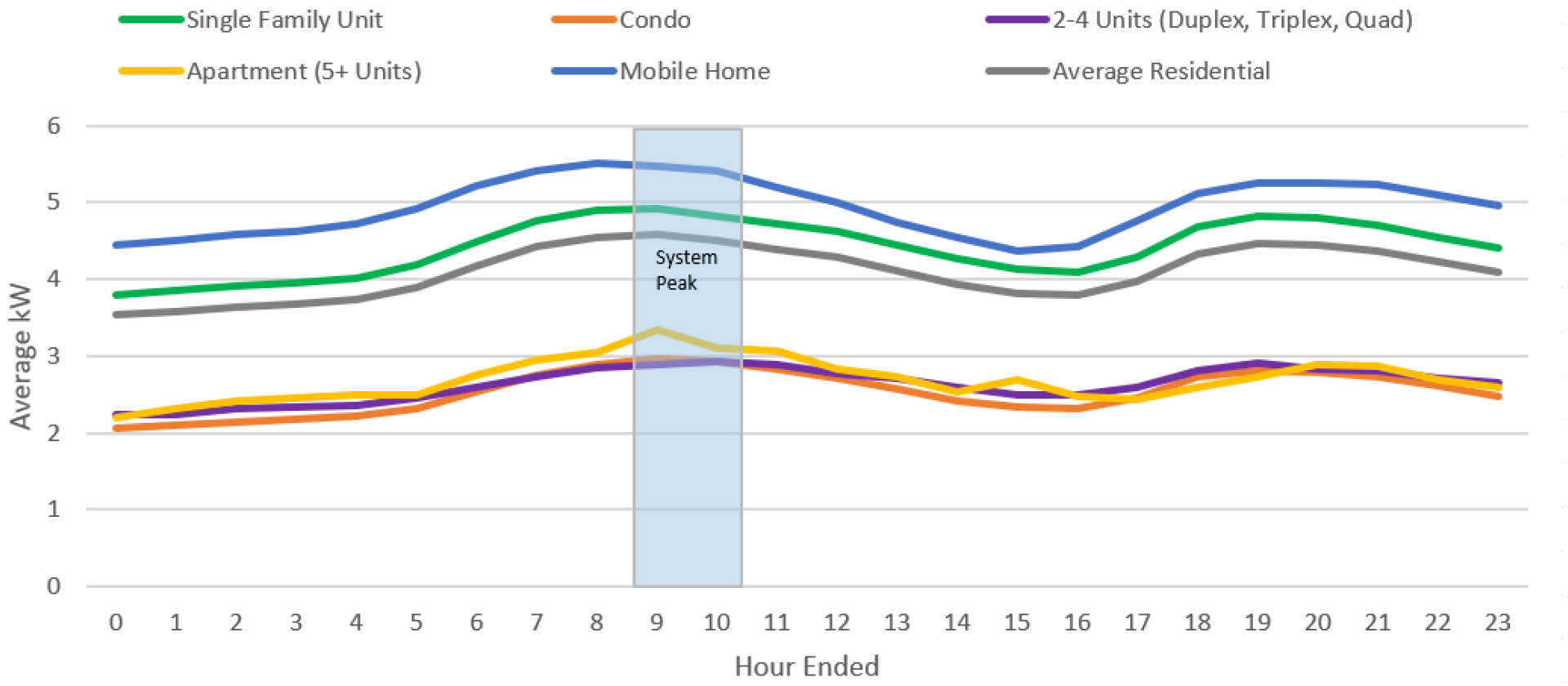
Contributions factors to Winter peak: Age of Residence

- The age of a home has as a more significant effect on contributions to winter system peak
- Homes built from 1975-1989 have the most usage and contributions to winter system peak



Contributions factors to Winter peak: Property Type

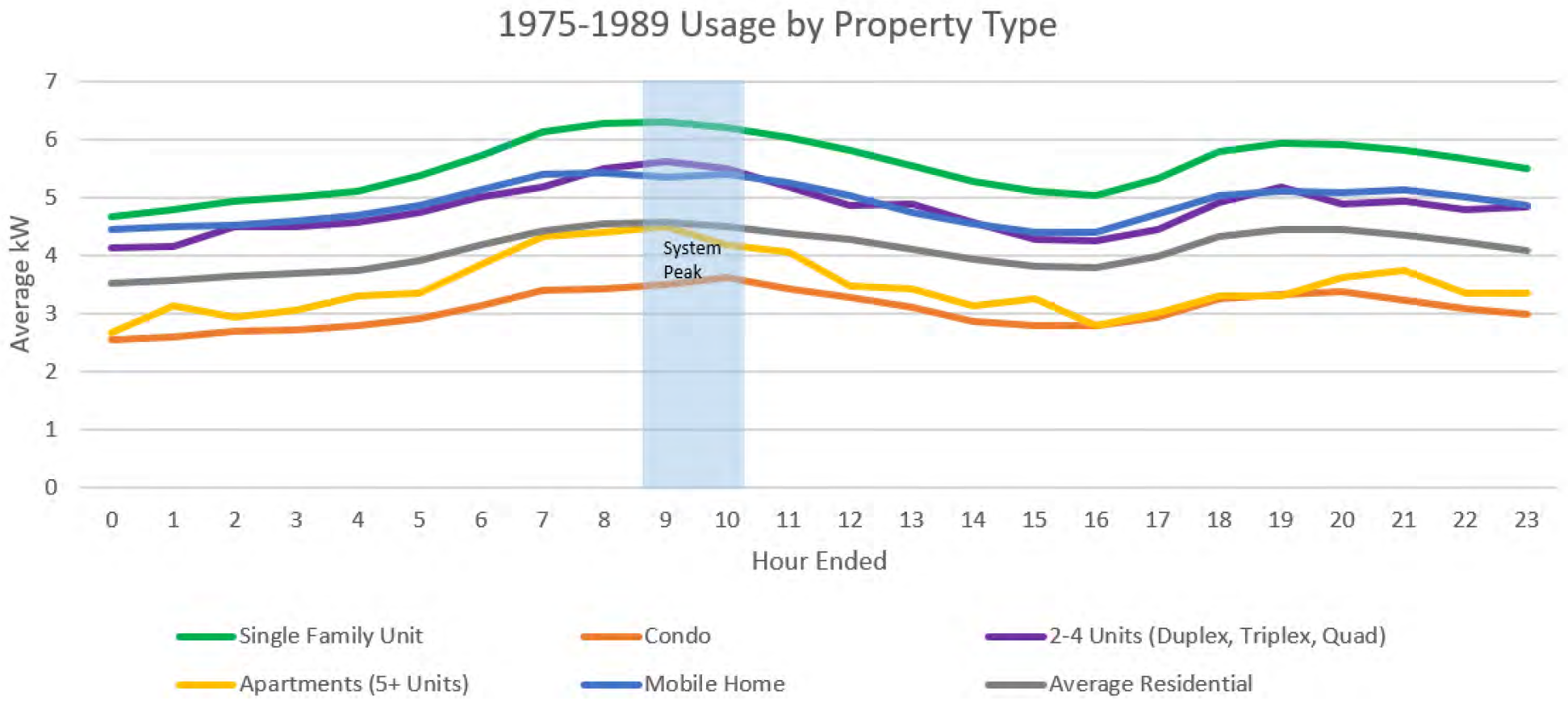
- Mobile homes were a particularly large contributor to the winter system peak
- Single family homes consumed significantly more energy than apartments or condos



*Excluded miscellaneous residences

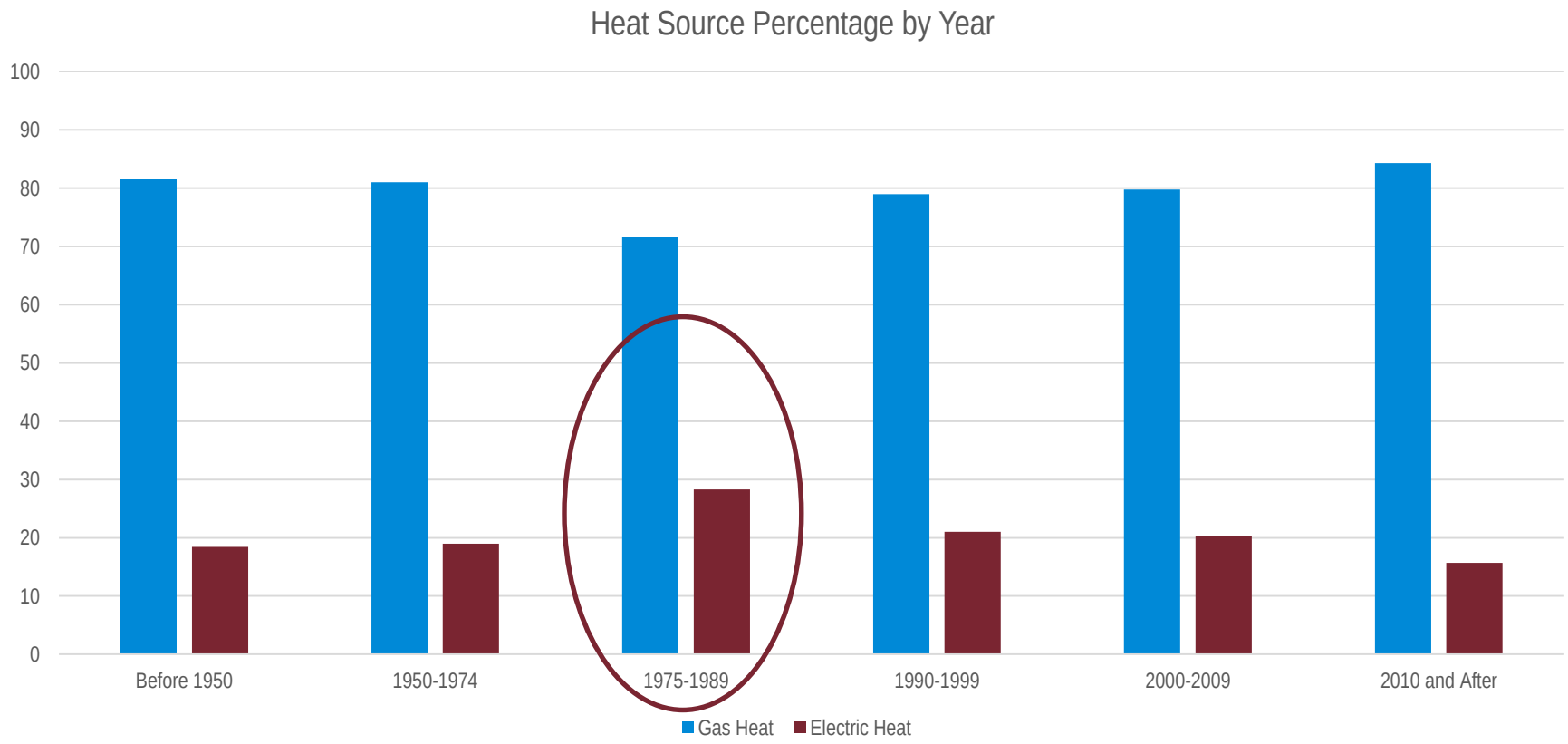
Contributions factors to Winter peak: Age of Residence 1975-1989

- From 1975-1989, Single Family Units have the most usage and contributions to winter system peak, with Mobile Homes and 2-4 Units contributing the second most



Contributions factors to Winter peak: Age of Residence

- Gas Heat is more prevalent in homes every year
- Electric Heat has the highest penetration from 1975-1989



Approach for Peak Reduction Opportunities

Target Peak Loads Identify DSM opportunities that best align with Duke's peak resource needs

Target Technologies Customers are Adopting Create customer value by taking advantage of market trends in Distributed Energy Resources.

Quick Start Opportunities
Plans to acquire resources identified in the MPS.

Interaction Between Technologies and Rate Designs
Combine smart programs and rate designs that provide ongoing savings for participants

Leverage Current Duke Programs
Look for ways to improve programs, delivery channels, and platforms in partnership with trade allies.

Incremental and Emerging Opportunities
Identify innovative program designs working in other areas

Stakeholder Input
Carefully consider diverse stakeholder input in developing plans.

Can Rate Design Help Reduce Peak?

DEC Pilot Load Impacts

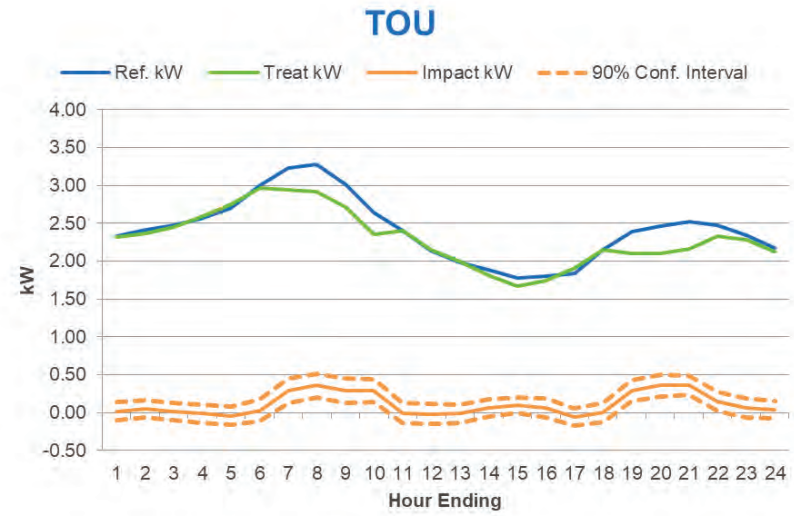
- Residential customers showed statistically significant load impacts during the event hours on all three rates Critical Peak Pricing (CPP), Time of Use (TOU), and Time of Use – Demand (TOUD) for critical and high event days
  - Event based impacts ranged from 7.1% (Residential Standard (RS) TOU, morning) to 19.3% (Residential Electric (RE) CPP, evening)

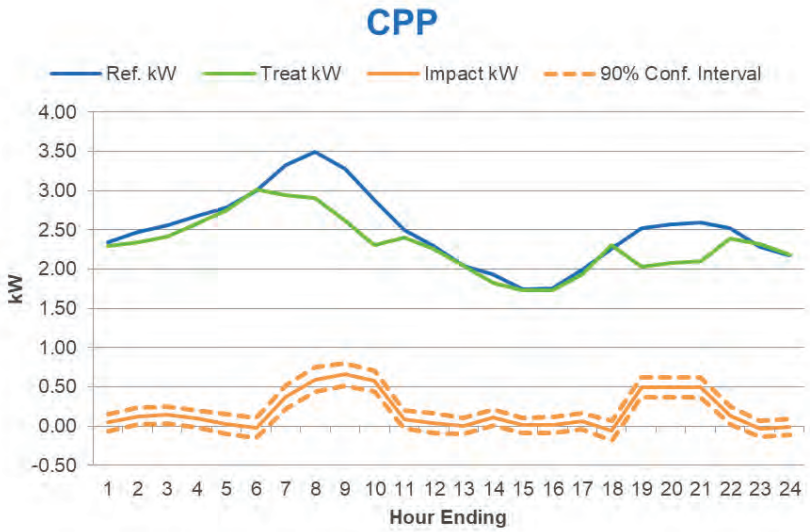
- Residential customers showed statistically significant load impacts across event hours on all rates (TOU and TOUD) for the average non-summer weekday
  - Average non-summer weekday impacts ranged from 4.2% (RS TOU, evening) to 8.5% (RE TOU, evening)
  - Event day impacts were greater than average weekday impacts

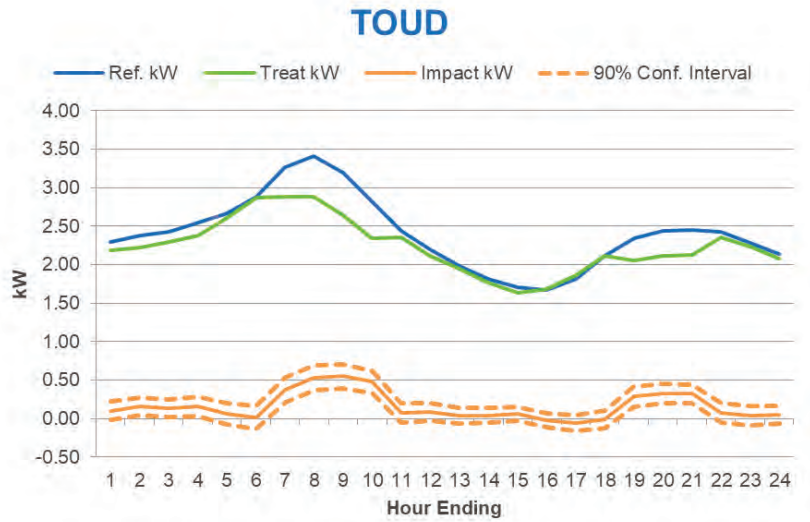
- Smart thermostats can lead to higher impacts among RE customers on all rates, especially especially during winter events

Event Day Load Impacts (RE)

- All events were called from 6 to 10 AM and 6 to 9 PM
- RE customers on all three rates showed statistically significant load reductions during the morning and evening event hours on the average event day
- It is important to note that TOUD customers experienced twelve events (9 high and 3 critical), while CPP and TOU customers experienced seven events (all critical) during the non-summer period







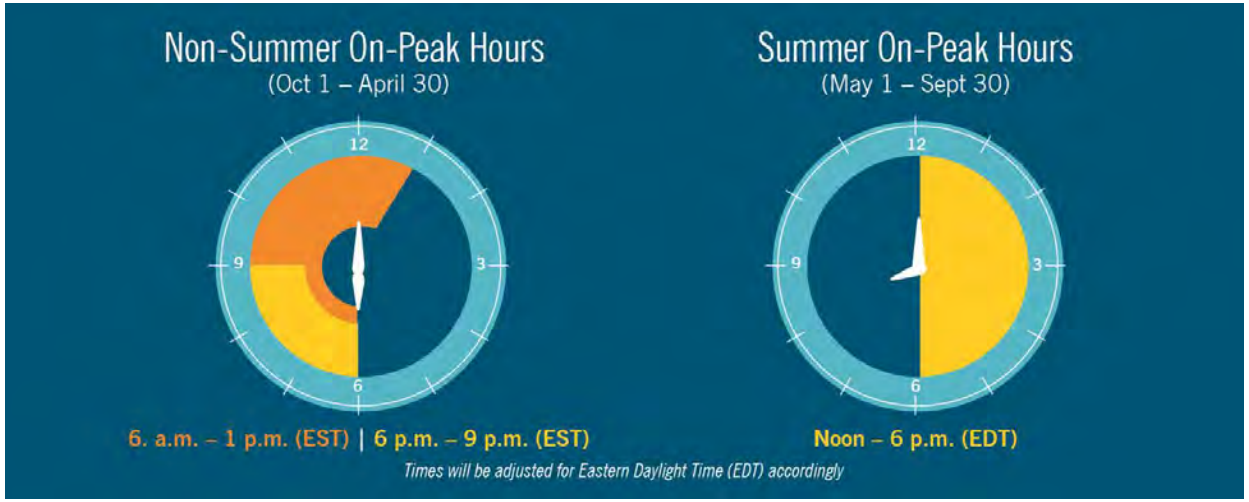
DEI Dynamic Rate Pilots

Inspired by our DEC-NC experience and the rollout of smart meters in DEI, dynamic pricing rate pilots were proposed in Cause No. 45253 (DEI Rate Case).

- The IURC approved all *6 pilot rates* proposed effective on July 30, 2020.
- Pilot marketing began on September 30, 2020 with the brand name Flex Savings Option.
  - Currently 69 CS customers and 906 RS customers
- There are *3 pilot rates* for both residential *(Rate RS) and* small commercial *(Rate CS)*
  - Each class of customers has 3 rate designs but only 1 design was offered to any individual customer.
- The *rate designs represent increasing levels of price signal complexity and customer engagement*. The rate designs are:
  - CPP – Critical Peak Pricing (20 Pricing Days)
  - VPP – Variable Peak Pricing (40 Pricing Days)
  - VPPD – Variable Peak Pricing with Demand (40 Pricing Days + kW Charge)

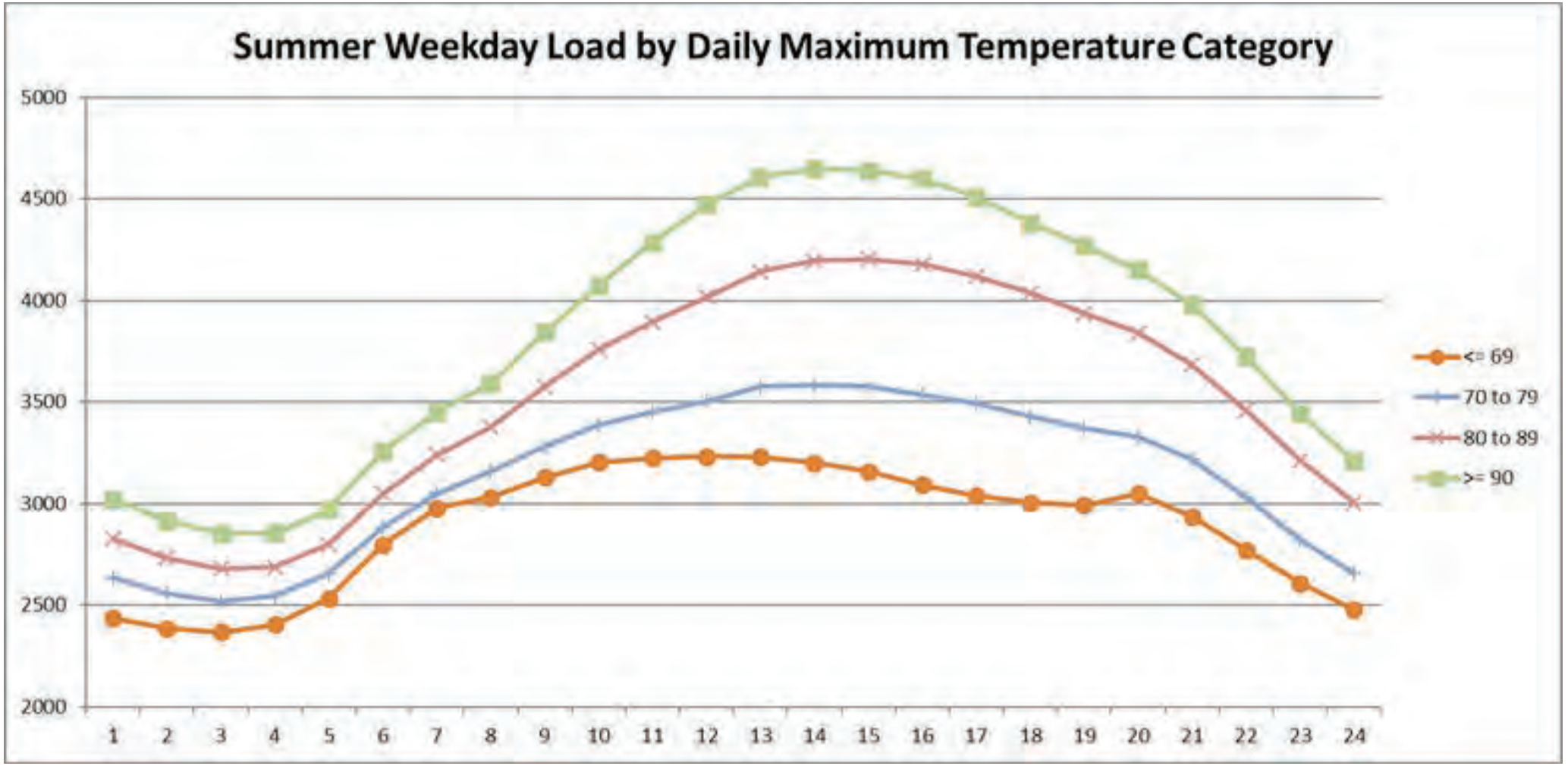
DEI Dynamic Rate Pilots

- Similar to traditional TOU rates, our pilot dynamic rates have a *defined On-peak and Off-peak period* for the summer and non-summer months.

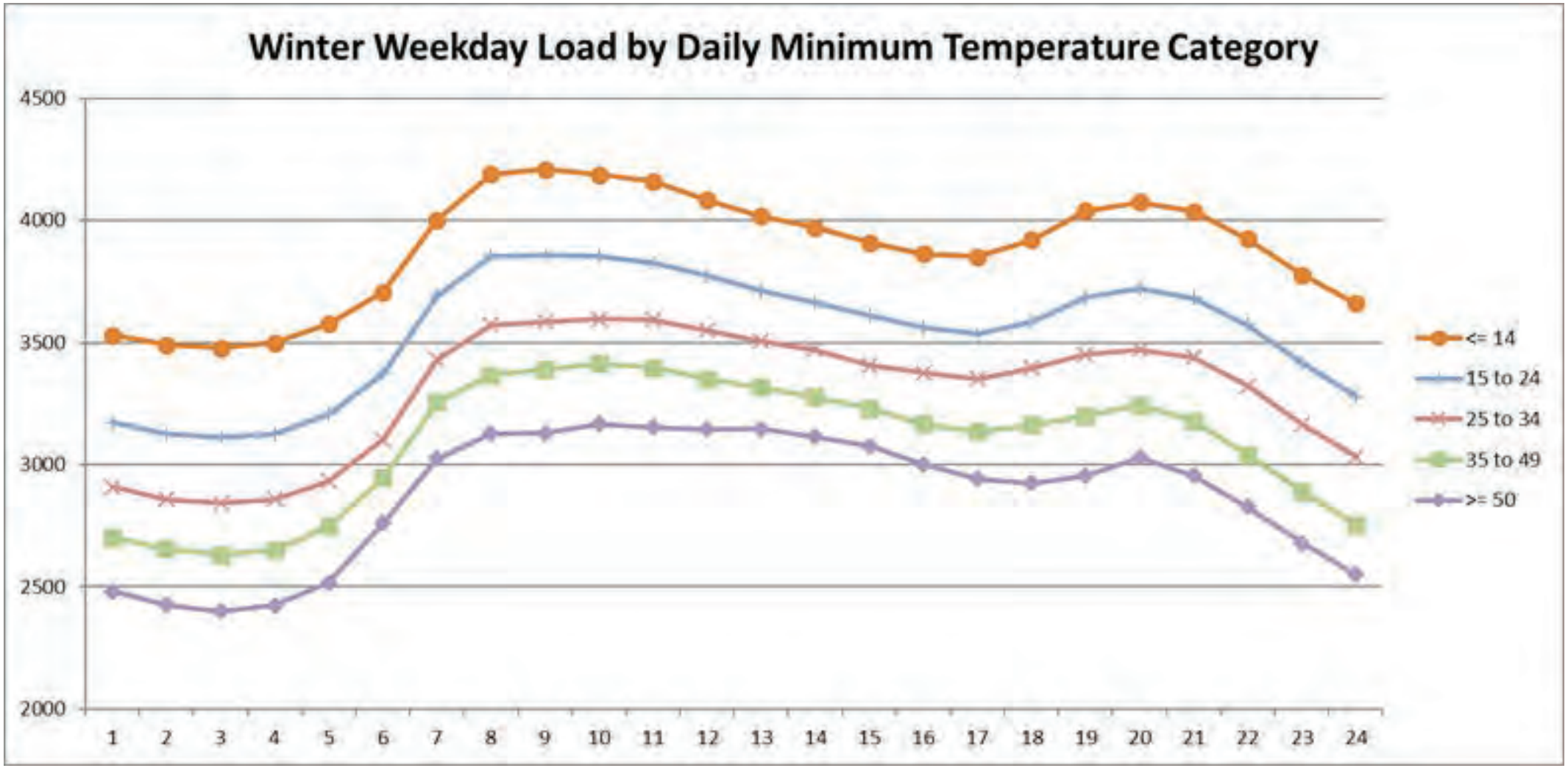


- Unlike traditional TOU rates, *higher prices are not in effect every day during the On-peak period*. Higher prices are only effective on hot/cold days when customer consumption (i.e., system load) is high. Therefore, the higher price On-peak days are determined dynamically and must be communicated to customers.
  - Results will be developed internally and reported to the IURC after the first year of the pilots. Year 1 results should be available in early 2022.

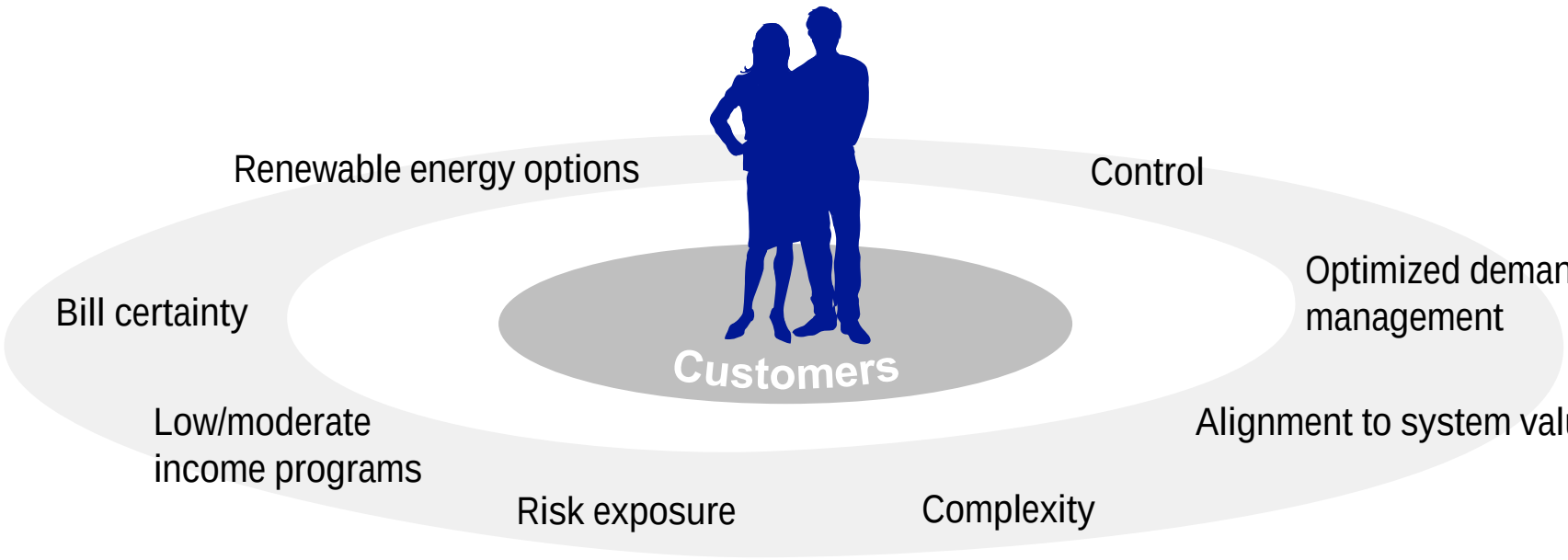
Summer Load Shapes by Temperature



inter` Load Shapes by Temperature



Pricing Options That Appeal To All Customer Segments



How Can Rate Design and Rooftop Solar Help with Winter Peak?

“First of a Kind” Rooftop Solar Settlement

Distributed Energy Resources

DERs

What do we mean by Distributed Energy Resources?

- Lawrence Berkley National Lab report to 21th Century Task Force looks at 5 different adoption levels of:
  - Rooftop solar
  - EV Charging
  - Battery Storage
- Others such as Hybrid systems, Combined Heat & Power (CHP), Fuel Cells, Small Engines

How will DERs be included in the IRP?

- Load modifier
- Generating resource

Closing Comments, Stakeholder Comments

Wrap Up

- Meeting survey to be sent out in the next week to attendees
- Comments can also be sent to:
  - Scott at: scott.park@duke-energy.com
  - Stewart at: stewart@vanry.com
- Meeting summary and other materials will be posted on website by Feb 3rd
  - https://www.duke-energy.com/home/products/in-2021-irp-stakeholder
- Next workshop expected to be in March/April

Acronyms

AMI	Advanced Metering Infrastructure
CHP	Combined Heat & Power
CPP	Critical Peak Pricing
CS	Small Commercial
DR	Demand Response
DER	Distributed Energy Resource
DEI	Duke Energy Indiana
DSM	Demand Side Mgt (EE + DR)
EV	Electric Vehicles
EE	Energy Efficiency
EIA	Energy Information Administration
IURC	Indiana Utility Regulatory Commission
IRP	Integrated Resource Plan
LBL	Lawrence Berkeley Lab
LBL	Lawrence Berkeley Lab
LMI	Low-Medium Income
MW	Megawatt
NEM	Net Energy Metering
NDA	Non-disclosure agreement
PVRR	Present Value of Revenue Requirements
RFI	Request for Information
RS	Residential Standard
RE	Residential Electric
TOU	Time of Use
TOUD	Time of Use with Demand
T&D	Transmission and Distribution
UCAP	Unforced Capacity
UPC	Usage per Customer
VPP	Variable Peak Pricing
VPPD	Variable Peak Pricing with Demand

Duke Energy Indiana
IRP Stakeholder Process
Summarized Meeting Notes
Meeting – January 25, 2021

Integrated Resource Plan

Stan Pinegar - Opens with an appreciation for the collaboration -

Safety -

Barry Blackwell - Level one check
Workplace Safety Quotes

Meeting Protocols

Introduction of Groups and Individuals

What are the Goals of the IRP Process?

Agenda

Recap of first meeting (Nov 10)

Review - 2018 - DEI IRP
Stakeholder Feedback
Contemplated changes of 2021 IRP
Overview of future stakeholder meetings
Load Forecasting

Follow ups from first meeting (Nov 10)

1. IRP 101
    - In light of the fact that there are many stakeholders new to Integrated Resource Planning, DEI has uploaded and updated version of the IRP 101 document that the utilities in the State developed to help familiarize people with the process and the terms that are used. This document is on the DEI IRP webpage.
    - Scott Park says that a second evening Q/A session in the June time frame would be appropriate

2. Load Forecasting - Considering Climate Change
    - Scott provided an overview of his discussions to date, and intended continued engagement with the Purdue Climate Change Research Center
    - Scott indicated that some new insights emerged from those discussions, including that there will be an increase in humidity that will accompany climate change - humidity will likely have impacts on load
    - Scott indicated that DEI will create a number of load forecasts which include a climate change forecast
3. Request for Information
    - We are heading to the market with an all source RFI
    - Scott – Timing: the RFI will be issued on or around the first of Feb and have it processed in time for modeling

Scenario Discussion

What is a scenario

Scott Park - I expect we will be in the 4 or 5 scenario range
Portfolios are the actual resources mix

Ray Wilson - Are the Biden decarbonization plans to be considered a scenario or portfolio?

- Stewart illustrates that multiple different portfolios can meet the Scenario

Ray Wilson requests that we have a Biden energy policy portfolio

Leslie Webb - Do we have a portfolio scenario that meets Dukes own goals - I would like to see a portfolio that meets corporates own goals -

- Scott Park - yes - but the timing is slightly different - there will be many of the portfolios that will be on track to achieve this

Simon Lomax - Follow up question - Where does the retirement of the Edwardsport plant?

- Scott Park - yes this will be part of the portfolio definition process

Simon Lomax -Follow-up - Will there be an Edwardsport analysis?

- Scott Park - yes

Simon Lomax – Follow-up - What do we mean by "laying up the plant"

- Scott Park explains the development of Syngas - there are many aspects to this technologically, so there are many options to be analyzed

Anna Sommer - Duke studied and discovered that sequestration was not feasible - what has changed? And are you proposing that for this IRP?

- Scott Park- this will require more study and monitoring of the evolution of technology

Mark Baird - Does Duke have any must run plants?

- Scott Park - some of the coal plants may be considered in that kind of way, because their dispatch needs to be made over a longer time frame. We have to make decisions for our customers - sometimes it's better to suffer a short term loss – to avoid longer term and larger losses

Mark Baird - Have any plants been worked to increase efficiencies

- Scott Park - Coal plants and all plants have potential projects over time to increase performance

Devi Glick - Will you be testing the possibility to switch back to gas from coal?

- Scott Park - this is something we will be looking into

Jeff Haverly - we are all becoming more and more aware of CO_2 and pollutants - how does Duke consider these - is there a weighting that the environment gets?

- Scott Park - We don't have a formal weighting for Environment - it creates the illusion of greater objectivity. We consider the requirement for compliance to be a kind of proxy. Duke is invested in the health and welfare of our communities.

Anna Sommer - Going back to self-commitment of Duke's MISO requirement that there be a certain reserve - they are looking at seasonal reserves - that would give us the ability to withhold certain units during some seasons. I would encourage seasonal reserves

- Scott Park - thanks that is a perfect example of a sensitivity analysis - We are increasingly focused on serving peak and we will need to make sure we are considering shoulders as well

Scenarios from Past IRPs

Scott Park reinforces the need for diversity in these scenarios

Scenarios for 2021 IPR

(DEI Scenarios)

Reference with carbon regulation

Reference without carbon regulation

(Stakeholder)

Rapid decarbonization and electrification

Current conditions

RFI Data

Michael Mullet - I like these - what will be the ongoing communication process to keep the scenario development synced up - We have engaged Synapse to assist. (Jason) we will be happy to coordinate with Duke to help people

- Scott Park agrees that the scenarios need to be internally consistent

David Ober - has any thought been given combining DERs and the impact on this IRP? (FERC 2222?)

- Scott Park- Yes, that will be considered

Mark Baird - do any scenarios envision retail competition coming into Indiana marketplace - Is this something that would be modelled?

- Scott Park - I am not sure it is within the scope of the IRP - Customer choice leaves us the question who will build generation and we need to check with regulatory group and get input from the regulator

Simon Lomax - Raises questions of EV - are you assuming that EV will increase load by 1, 3 and 5% over time? What does that mean? Does the actual increase of EV's?

- Scott Park - we use load forecast for 20 years. EVs will clearly have an impact on energy served in addition to impact on the peak. Many EVs charge off peak so their impact on the peak is not as large as their impact on energy used.

Simon Lomax - What will be the share of EV's in the 2030's of load?

- Scott Park - I will get our assumptions on EVs and share at a later time

Anna Sommer - It will be important to think of resource accreditation - Also - Consideration of scheduled outages during winter is also very important.

- Scott Park says we need to manage an increasingly complex set of conditions in the resource mix.

Mike Rogers - I feel like you all are speaking Latin - please let us know about the acronyms - How does RFI impact all of this?

- Scott Park we are trying to make better assumptions about costs and the RFI's help us get more narrowly focused.

Devi Glick- I would like to see a scenario that removes the hard-coded retirement dates -

- Scott Park - that is something we will do - we will relax our assumptions

Jeff Haverly - I would hope that as your load goes up - that you would try - It does not make sense to support citizens efforts to buy an electric car, and then power it up by dirty coal.

Dory Chandler - Is customer generation included in this analysis

Scott Park yes

Anna Sommer - It's really important to be logically consistent

Anna Sommer - I am in favor of a MassCap

Scott Park – We can discuss this further

Ray Wilson - we want Duke to be on track for carbon neutral - we don't want to be focused on regulation - cost is not as important

Scott Park - it's a balancing act and we need cover the concerns and interests of all of our customers

Leslie Webb - I want to try to understand the 20-year plan - do you incorporate short term milestones. What mechanisms do you have to show you are being successful?

(Lunch)

Innovation through AMI Data and Rate Design

Lon - introduces himself

Targeting System Challenges

AMI to Target Summer Peak loads

Lon Huber - Peak days are a barrier to optimizing the grid

AMI to Target Winter Peak Loads

From Vision to Product

Introduces the dashboard

Contributions Factors to Summer Peak - Income Level

Contributions Factors to Winter peak: Income Level

Low and Moderate Income (LMI)

Ben and Jeremy - How does Duke know what the income levels are?

- We use third party sources - we do not track individual customers' incomes

JW - could you please send source data for slide 20 and slide 19
Lon - yes

Alex Jorck - is this mean or median? Important

Contributing factors to Summer peak: Age of Residence

Contributing factors to Summer peak: Property Type

Contributions factors to Summer peak: Age of Residence 2000-2009

It would be interesting to see gas versus electric heating

Contributing factors to Winter peak: Age of Residence

Contributing factors to Winter peak: Property Type

Contributing factors to Winter peak: Age of Residence 1975-1989

Contributing factors to Winter peak: Age of Residence

Approach for Peak Reduction Opportunities

Can Rate Design Help Reduce Peak?

Duke Energy Carolinas (DEC) Pilot Load Impacts

Event Day Load Impacts (RE)

Duke Energy Indiana (DEI) Dynamic Rate Pilots

Lon Huber – Revenue neutral is often confusing - for average users its revenue neutral – meaning if they take no actions then they should not see an impact in their bill.

- Stewart Ramsay- if I were a critical peak customer - If I know the times of the peak pricing then I can reduce my usage during those time periods and as a result the cost of my electricity would be lower. Is that correct?

  Lon – yes. Exactly

Mike Rogers - I was offered the flex savings and I was told I was not eligible - is this an incentive and disincentive

- Lon Huber - it discourages above average usage and encourages less

Nathan Rues - I am on the plan, but I have not had an event yet. My feedback is to see another rate but its real time pricing - I am willing to do what it takes

Lon - I encourage you to think about how this would affect mass market customers - It's not the easiest to administer. We have not declared an event because there has not been cold snap yet. (I guarantee there will be an event coming for you)

Kristy Bryan - I am an enthusiast - and have done a lot that are the obvious fixes, but air sealing is a big issue in my old house and Duke is not saying much about it.
Amy Dean provided update in chat on Duke energy efficiency programs that include air sealing

Mike Mullet - In terms of who is being offered how do you determine that this is a representative group and what are the levers you use to help people make changes?

- Lon Huber - We apply statistical methodologies.

Mike Mullet - what is the interval you are using

- Lon Huber - 1 hour

Jeff Haverly - I have a system called Sense on my house and it helped me immensely to understand my own load. Is this technology that could be put into your meters

- Lon Huber - It's called consumption modelling and I am looking for vendors to get it cost effective - it will give us minute by minute reporting - you would not even need to go out to the meter anymore. That technology is right around the corner.

Mark Baird -What do you need to do in order to offer these rates on a non-discriminatory basis?

- Lon Huber - we will be able to identify structural winners and losers.

Leslie Webb - how does this relate to IRP proposal?

- Lon Huber – We will cover on last slide

Anna Summer - I have been thinking about the users - is this information being used to inform energy efficient programs?

- Lon Huber - it's too early to say, but there is some - it's a really good point

Mike Mullet - my feedback is we need feedback loops - smart thermostats and customer portal - to what extent is Duke looking at installing feedback loops

- Lon Huber - We are going through a huge customer transformation that will allow us to much better get targeted feedback to our customers. This is the future, and this is where we

Denise Abdul-Rahman - How will your pilots ensure inclusion - are you marketing to vulnerable communities. Can you share the census tract?

Lon Huber - For these initial pilots the marketing was randomized and not targeted towards any certain populations.

Brian Bak - I want to point out that we are working with CAC - and Anna - for each piece of the market potential study for energy efficiency.

Pete Lenzen - what about solar on all kinds of areas that we do not have them now?

Barry Kastner - I have done studies on time of use and solar - people can really reduce rates when they combine the two

Leslie Webb - I am still confused about how this fit with portfolios - Does AMI fall into the same category as EE and DSM in that it will have only a small impact?

- Lon Huber - we don't know yet whether it will have a big impact - maybe is will or not but we want to look at it.
- Scott Park indicates this (AMI) is still a very new to us to know how it can help

Matthew Kovach - Is there a pilot program that could be implemented to encourage solar production - has this been considered?

- Lon Huber - The issues is that whenever you install you are committed to whatever the outcomes are - it's a passive technology - It depends on the market prices - it depends on the location

Will Kenworthy - I appreciate the presentation - Treating DER as a part of load rather than an offset –

- Lon Huber - there is a lot of potential -

Nathan Rues - I like the optimism but I think we should go faster. Rate design is a knob you can turn at any time - much faster than building a plant - customer behaviour is key

- Lon Huber - We are trying to get ahead - our billing / CRM is a key to the success of this.

- Denise Abdul-Rahman - Can local solar positively impact vulnerable communities?

Lon Huber - Public is best, and a community solar pilot is the best way, but we are just getting into the pilots on this. [Duke will address this issue offline]

DEI Dynamic Rate Pilots

Summer Load Shapes by Temperature

Winter Load Shapes by Temperature

Pricing Options That Appeal to All Customer Segments

How Can Rate Design and Rooftop Solar Help with Winter Peak?

Distributed Energy Resources

DERs

Leslie Webb- When you talk about rooftop - is this owned and is it capped at 1.5%?

- Kelley Karn - there is a cap and we are in the planning stages of our new distributed generation rider

Leslie Webb - are you looking at increasing the cap for DERS in the IRP?

- Scott Park - We will be addressing it in our load forecast

Leslie Webb - Do you foresee Utility owned rooftop solar in the future?

- Scott Park - Rooftop is likely too small a footprint from a utility point of view.

Mike Mullet - We see DER's exploding over the course of the 20 years of the IRP - We understand that this is disruptive to the monopoly - but you can't stay in one place. We see DER's as being fundamental to the IRP - Distributed are fundamental to the energy marketplace. The possibilities are limited only - you cannot put on blinders as a corporation. I know you have the smarts - do you have the corporate OK do actually do it?

- Scott Park- we see a couple of opportunities to make this happen going forward.

Leslie Webb - Will we take climate change seriously? We are looking at almost reaching tipping points.

Laura Arnold - what is the distribution plan for the RFI?

- Scott Park - commits to circulating the RFI to Stakeholders upon request -

Wendy Bredhold - It would help to have all dates in the process ahead of time.

- Scott Park commits to providing dates for next two meetings

Wrap Up







2021 Integrated Resource Plan
Stakeholder Workshop #3

April 21, 2021

WELCOME

SAFETY MESSAGE

TECHNOLOGY

Microsoft-Teams check

OPENING COMMENTS

INTRODUCTIONS

Meeting Protocols

- The value of this process is in participation … please jump in!
- We set aside time at the end of each section for Questions, and if you need clarification at any time, feel free to ask!
- ”Raise your hand” for comments and questions, we will try to get to you ASAP - We will not actively be monitoring Chat
- Video use throughout is welcome and please use your video when talking
  - Although, it’s not a requirement, it helps us to see who we are speaking with.
- Mute mic when you are not speaking.

What are the Goals of the IRP Process

INTEGRATED RESOURCE PLAN (IRP):

DEI's plan to provide safe, reliable and sustainable energy solutions for our Customers in Indiana.

- IRPs are submitted every three years
- Plan is created with stakeholder input
- 20-year look at how DEI can cost-effectively serve our customers
- Modeling and analysis culminate in a utility preferred resource portfolio

What is a preferred resource portfolio?

"'Preferred resource portfolio' means the utility's selected long term supply-side and demand-side resource mix that safely, reliably, efficiently, and cost-effectively meets the electric system demand, taking cost, risk, and uncertainty into consideration."

IURC RM #15-06, LSA Document #18-127
Link (PDF): https://www.in.gov/iurc/files/RM_ord_20181024141710007.pdf

Agenda

10:00	Welcome & Introductions ✓
10:30	Recap of second meeting
10:40	Follow-ups from previous meetings
	-Request for Information (RFI)
	-Climate Change Load Forecast
11:20	Modeling Energy Efficiency (EE) & Demand Response (DR)
12:00	Lunch break
1:00	Modeling Distributed Energy Resources (DERs)
1:20	Scenarios
2:20	Portfolio Tool demo
2:50	Wrap up

DUKE ENERGY

Recap of second meeting (Jan 25th)

- Recap of Nov 10th meeting
- Follow ups from first meeting
  - IRP 101 & Evening Q&A
  - Load Forecasting considering climate change
  - RFI
- Scenario discussion
- Advanced Metering Infrastructure (AMI), Customer Programs & DERs

Request for Information (RFI)

- Also based on feedback from stakeholders, we issued an RFI to gather information from the market. This will also act a foundation for an Request for Proposal (RFP) that could be issued in early 2022
  - Issued on Feb 8
  - Responses due by March 22

Summary of RFI data

Solar Only PPAs

	Term	DEI ($/MWh)	MISO Z6 ($/MWh)	OOS ($/MWh)
Solar Only	15	$ 34.45	$ 46.25	N/A
Solar Only	20	$ 39.35	$ 41.89	N/A
Solar Only	25	$ 36.57	$ 38.38	N/A
Solar Only	30	$ 36.02	$ 37.65	N/A

Wind Only PPAs

	Term	DEI ($/MWh)	MISO Z6 ($/MWh)	OOS ($/MWh)
Wind	20	N/A	N/A	[redacted]

Gas Only PPAs

	Term	DEI ($/MWh)	MISO Z6 ($/MWh)	OOS ($/MWh)
Combustion Turbine	20	[redacted]	N/A	N/A

Storage Only Add On to Solar PPAs

	Term	DEI ($/Kw-mo)	MISO Z6 ($/Kw-mo)	OOS ($/Kw-mo)
Storage Add On	15	$ 12.10	$ 11.58	N/A
Storage Add On	20	$ 7.98	$ 5.50	N/A
Storage Add On	25	N/A	$ 7.86	N/A

Build Own Transfer Options

	Term	DEI ($/KW)	MISO Z6 ($/KW)	OOS ($/KW)
Solar Only	35	$ 1,257	$ 1,421	N/A
Solar + Battery	35	$ 1,563	$ 1,522	N/A
Wind	30	N/A	N/A	[redacted]

Category	Percentage of MWs
PPA - Solar Only	47%
PPA - Wind Only	2%
PPA - CT Only	5%
PPA - Storage Add On	4%
BOT - Solar Only	30%
BOT - Solar & Batt	11%
BOT - Wind Only	2%

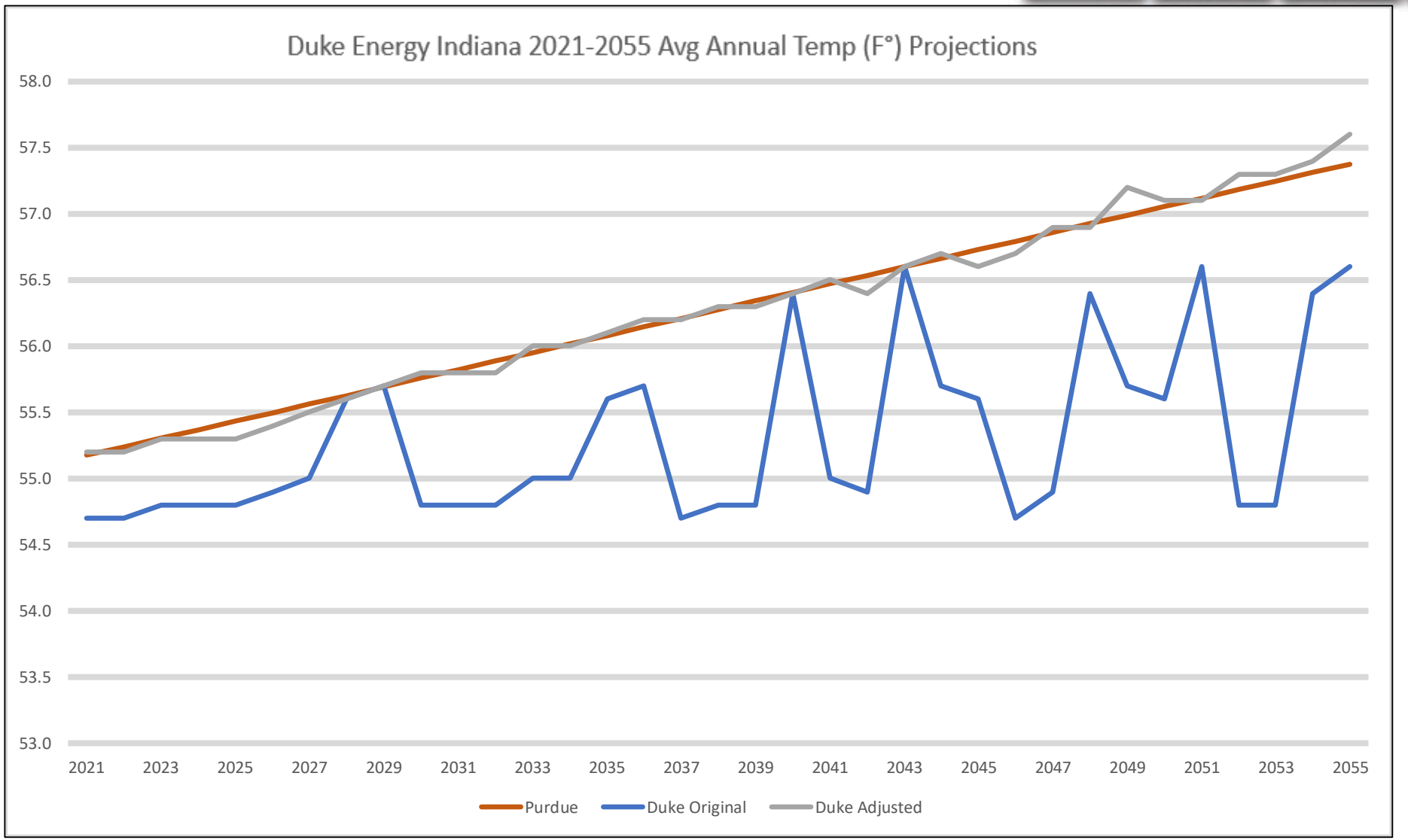
Notes:
-Costs represent an average cost of all bids in the category
-Costs were not adjusted into a common year
-Location defined by point of interconnection
-Bids Received March 22, 2021
-OOS – Out of State

Climate Change Load Forecast

Load Forecasting considering climate change

- Based on feedback from stakeholders, we have been in contact and are working with the Purdue Climate Change Center to develop a load forecast that considers climate change
- This was developed by
  - Creating a new weather forecast that includes temperature and dew point
  - Historical weather and load data correlations were maintained
- Climate Change Load Forecast may be used in a Stakeholder Scenario or in a Sensitivity

Climate Change Load Forecast



Modeling EE & DR

Energy Efficiency

- What is Energy Efficiency (EE)?
  - EE is a device or program that results in a reduction of electricity consumption
  - EE is cost effective when the value of the energy saved exceeds the cost of the device or program
  - LED lighting, weather insulation, air conditioner incentives

- Energy Efficiency will be modeled:
  - Approved programs will be included into all portfolios through 2022
  - Subsequent years will make use of the data from the Market Potential Study
- Rather than creating upwards of 100 EE bundles, we are evaluating an approach that aggregates EE into groups/bundles that reflect plausible savings in future DSM programs

DUKE ENERGY

Demand Response

- What is Demand Response (DR)?
  - DR is a program that results in a reduction of electricity consumption at the time of peak demand
  - DR is cost effective when the value of the energy saved exceeds the cost of the program
  - Thermostat controls, swimming pool control, industrial load control
- Similar to EE, Demand Response will be modeled as
  - Approved programs will be included in the model
  - Subsequent years will make use of the data from the Market Potential Study
- Due to the method that MISO accredits DR resources that understates the true DR value we will be evaluating DR based on it contracted levels

Lunch

Modeling DERs

Distributed Energy Resources

- We will model DERs in a way that leverages the study of the LBNL report which grouped DERs in 3 main groups
  - Electric Vehicles
  - Net Energy Metered Solar
  - Storage
- The different levels of DER in the LBNL report will be primarily modeled as load sensitivities
- Economic examples and conditions

Scenarios

What is a scenario?

- A scenario is a set of internally consistent assumptions that are external to the utility and beyond its control
  - Needs to include specific assumptions that can be entered into models
  - For example, carbon regulation, fuel prices, cost of new generation
- A portfolio is a set of resource additions
  - For example, build a solar or combined cycle project; retire a unit; add more Energy Efficiency
- A sensitivity is an analysis where a key variable is changed
  - Provides insight on the risks with changes in that variable

- The analysis will combine both of these efforts where we will test the portfolios across the range of scenarios which will measure the robustness and expose risks of the portfolios
- Each scenario needs to stand on its own, but a diverse group of scenarios is also important

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Scenarios for 2021 IRP

SCENARIOS	ENVIROMENTAL REGULATIONS	LOAD	GAS PRICES	COAL PRICES	FUEL SOURCES	COST OF NEW GEN SOURCES	TAX INCENTIVES
Reference w/CO2 Reg	CO2 tax starting in 2025	Base	Base	Base	IHS-Markit	Burns & McDonnell; Guidehouse	Yes
Reference w/o CO2 Reg	No Co2 tax	Base	Base	Base	IHS-Markit	Burns & McDonnell; Guidehouse	Yes
Current Conditions Continue (Low Gas)	No CO2 tax	Base	Low	Low	*AEO High Gas & Oil Supply	Burns & McDonnell; Guidehouse	Yes
Current Conditions Continue (High Gas)	No CO2 tax	Base	High	High	*AEO Low Gas & Oil Supply	Burns & McDonnell; Guidehouse	Yes
Deep Decarbonization & Rapid Electrification	Mass Cap	Higher	TBD	TBD	*AEO High Gas & Oil Supply	TBD	Yes
Biden Climate Plan	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Other Stakeholder Scenario							

SENSITIVITIES

RFI Cost information
DSM Escalation
Climate Change Load Forecast
Gas Prices
Others?

NOTES & STAKEHOLDER FEEDBACK

*Scalars based on the AEO Scenario

Higher CO2 tax
Consider different capacity accredition methodologies
In Biden Climate plan, include interemediate CO2 reduction target
Interested in DDRE scenario without electrification for comparison purposes

Portfolio Tool

Portfolio Tool

- The Portfolio tool allows the user to:
  - Create different portfolios and how load would be served over a week's time
  - Uses historical load, wind and irradiance data
  - User can evaluate portfolio using weeks from spring, summer and fall

- Link: https://deiscreeningtool.duke-energy.com/
- The link to the tool will be turned on later this week

Closing Comments, Stakeholder Comments

Wrap Up

- Meeting survey to be sent out in the next week to attendees
- Comments can also be sent to:
  - Scott at: scott.park@duke-energy.com
  - Stewart at: stewart@vanry.com
- Meeting summary and other materials will be posted on website by April 30
  - https://www.duke-energy.com/home/products/in-2021-irp-stakeholder
- Next workshop expected to be in June

Acronyms

AMI	Advanced Metering Infrastructure
CHP	Combined Heat & Power
CPP	Critical Peak Pricing
CS	Small Commercial
DR	Demand Response
DER	Distributed Energy Resource
DEI	Duke Energy Indiana
DSM	Demand Side Mgt (EE + DR)
EV	Electric Vehicles
EE	Energy Efficiency
EIA	Energy Information Administration
IURC	Indiana Utility Regulatory Commission
IRP	Integrated Resource Plan
LBNL	Lawrence Berkeley National Lab
LMI	Low-Medium Income
MW	Megawatt
NEM	Net Energy Metering
NDA	Non-disclosure agreement
PPA	Purchase Power Agreement
PVRR	Present Value of Revenue Requirements
RFI	Request for Information
RS	Residential Standard
RE	Residential Electric
TOU	Time of Use
TOUD	Time of Use with Demand
T&D	Transmission and Distribution
UCAP	Unforced Capacity
UPC	Usage per Customer
VPP	Variable Peak Pricing
VPPD	Variable Peak Pricing with Demand

Duke Energy Indiana
IRP – Meeting 3 Draft Notes
April 21, 2021

Slides 1-6: Introduction - Safety, Introductions and Overview of Agenda – Stewart and Scott

1. Leslie Webb - Is there a short-term action plan in this long-term IRP?
   - Yes, there is a five year action plan that will be developed as well.

2. Ray Wilson - Our definition of 'PREFERRED RESOURCE DEFINITION' is out of date. Can you please change?
   - This is a regulatory rule which Duke Energy cannot change on its own, however the definition is broad enough to consider climate and CO_2 issues, which are discussed extensively in this process.

3. Ray Wilson asks for Duke to lobby for legislative changes in support of climate action,
   - This is a legislative policy issue and not a commitment Duke can make in this meeting.

4. Ray Wilson – "I want to be on the record that this an urgent topic."

Slide 6: Recap of January 25th Meeting

1. Scott Park Reviewed prior IRP stakeholder meeting

2. Barry Kastner - In reference to the previous slide 'What is Duke's definition of "sustainable?"
   - Sustainability is a balance of outcomes – environmental, economic, and technological.

3. Barry Kastner - If you don't talk about the sustainability of generation - it should be included.

4. Susan Schechter - You are signaling that you are not serious about renewables - you are "green washing."
   - This is not consistent with how I see things. We don't know what the preferred portfolio is going to be, but I expect there will be quite of bit of renewables in the front end of this in the short term.

Slide 7 – Request for Information

1. Simon Lomax - Do you have an update on the Edwardsport close-down?
   - There is no update, but the timing and process would be part of the analysis.
2. Will Shields - Will you be closing the Gibson plant?
   - This decision and the timing of retirement will be driven by the results of the analyses as well as other factors.
3. Jennifer Washburn - Is your response about resource changes TBD - can we submit our ideas?
   - Yes, please do.

4. Jennifer Washburn - when can we see the actual bids?
    - We need to be cognizant of commercial confidentiality. We will review what information can be shared with those that have signed NDAs and are not a competitive entity and provide that information shortly.

5. Mike Mullet - I think it would be helpful to publish the remaining meetings - when will the major topics come into this process -
    - We laid out a general plan, and it sounds like we need to update it to make it current. Follow up: Duke Energy will provide a road map of additional meeting topics with the materials for the next stakeholder meeting.

6. Denise Abdul Rahman - We would like to see more transparency in the RFI for results that support POC and the relative disparity of their financial contribution to Duke's revenues versus their participation in jobs, contracts, and financial benefits of the system. Denise reiterated her request that the process be able to demonstrate outcomes in this area.
    - This was an RFI where the utility was just looking to gather information and does not get into the issues you raise.

7. Wendy Bredhold - what is the analysis approach to Edwardsport?

    - The details are being worked out and will be provided in subsequent stakeholder meetings. We are looking at retirement and conversion to natural gas operations.

Slides 8 - Summary of RFI Data

1. Scott Park provides context for RFI Data

2. Laura Arnold - Can you provide a list of companies that submitted?
    - We will need to check the legality of providing this and confirm its permitted under our NDAs with bidders.

3. Laura Arnold – If you can provide the number of total responses that would also be good.

4. Will Shields - This RFI does not show how much you are trying to buy?
    - The RFI was not done with NEED in mind. DEI did not set a limit on how much people could offer. It was done for price discovery purposes. Once we have an identified near term need, a formal RFP will be conducted (likely late 2021/early 2022).

5. Will Shields - how hard is it to shift a plant to solar?
    - General discussion of solar requirements.

6. Ben Gorman - There is no pricing or data on stand-alone bids.
    - We got some responses without pricing.

7. Ben Gorman - for the RFP stand-alone will be considered.
    - Yes.

8. Anna Sommer - How many solar responses did you get?

- 40 or 50

9. Anna Sommer - the estimates in the IRP should be based on the lower costs reflected in the RFI results, not average costs that you are displaying here.
    - This will be discussed in subsequent meetings.

10. Anna Sommer - Storage add-ons?
    - There were proposals with solar and storage.

11. Anna Sommer - Did you get aggregated DER's?
    - No

12. Anna Sommer – It is not surprising that you did not get a lot of wind - interconnection issues complicate wind resources in MISO.

13. Mike Mullet - Where did Indiana PJM resources show up? Did you go there?
    - We focused on MISO - We were looking for prices in the MISO area of DEI. We did not get any responses for resources in the PJM part of DEI.

14. Mike Mullet - Did you not have a 50-megawatt limit?
    - I would have to look at the RFI to see if we had a lower limit on the size, I don't believe we did. Follow up: There was no MW limit included in the RFI.

15. Devi Glick - how do these costs compare to current costs?
    - We have not got there yet - this will be done in the scenario modelling.

16. Devi Glick - I am interested in the costs and other assumptions you are using.
    - We will discuss that and prior to us making the modeling runs.

17. Simon Lomax - is there a version of this with more detail?
    - Yes, we have one, and we can share the more detailed version with noncommercial NDA signers.

18. Simon asks for clarity - do you have what the dispatchable costs would be in the more detailed $ PER MEGAWATT HOUR?
    - Yes

Slide 9 – Climate Change Load Forecast

1. Scott Park - We have been working with Purdue Climate Change to look at what the impacts of climate might be on both temperature and humidity which we know are two drivers of load. We have used historic correlations between temperature, humidity and load and are applying those correlations to the climate weather forecasts to forecast load under the climate scenario.
2. Susan Schechter - does the load forecast take into account changes in electrification?
    - No, the exercise of coming up with a Climate Change Load Forecast does not include any change in electrification other than what is in the base load forecast.

3. Jeff Haverly - Does DUKE look at the resilience of their facilities to climate change?
    - It is something we have an eye on

4. Anna Sommers - what does climate change mean in terms of this forecast?
    - We will show this on a chart going to 2050.

5. Anna Sommers – Is this an unabated forecast?
    - Yes. We have not made any assumptions about abatement. We are using the current forecasts from Purdue's climate change model.

6. Anna Sommers - Will you make the paper available?
    - Yes. Follow up: Here is a link to the publicly available paper.
    - More accurate climate change model reveals bleaker outlook on electricity, water use - Purdue University News (hold control and click link)

7. Anna Sommers – are you considering on ambient temperature impact on decreasing efficiency and impacts on the transmission system and on system losses.
    - That is probably beyond the ability of this model to calculate impacts on distribution system losses. It does factor into the generation model as those consider temperature relative to ratings and output.
    - We can work collaboratively on a method to take that into account.

8. Darrel Boggess - Indiana University has a valuable resource on climate impacts - have we been using them?
    - I'm not sure if this being done. For IRP purposes we are relying on the Purdue climate paper.

9. Mike Mullet - We think there should be a climate change load forecast in Duke's base case - in the sense that you have anachronistic weather assumptions - normalized weather should not be part of the base case. Also - You have a great data source for modelling capability. Use of normalized weather is a imprudence, per se.
    - Not sure we could adapt base case issues in the time frame of the IRP. We will be using it as a load sensitivity.

10. Denise Abdul Rahman - We have concerns around heat and storms and how much of the IRP takes into account this in terms of assuring resiliency of vulnerable communities - Is the IRP taking into account policies coming in.
    - Yes - risk, cost, rates are critical.

12. Julie Lowe - We have moved to investment free of fossil fuel - If Duke is taking sustainability seriously, you will need to move to reduce carbon quickly.
    - We agree.

13. Will Shields - 2050 is too late for carbon-free?
    - We will be looking at different scenarios with shorter carbon free timelines, as well.

Slide 10 - Climate Change Load Forecast Slide

1. Susan Schechter – Energy efficiency seems like an area where under-benefited communities will be included.

- Yes, we have energy efficiency programs targeted at low income customers today and included in the market potential study.

2. Mike Mullet - is lost revenue included in this calculation?
    - No. Lost revenue is not a factor in determining the merits of Energy Efficiency.

3. Devi Glick- Will the Market Potential study be made public?
    - Yes - Demand Response market potential study will be discussed in these meetings and made public.

4. Anna Sommers - re Energy Efficiency - Are you waiting for anything for us to look at a third phased level? Dan Mellinger – NIPSCO ended up using other modeling – how does that compare to DEI?
    - We have four different cases and would be interested in collaborating.

5. Susan Schechter - Is peak load in the mid-afternoon?
    - It could be winter morning or more like 4 pm in summer.

6. Susan Schechter - would rooftop support your ability to support that. Does Duke refuse to look at rooftop solar? Can you not lobby to make a legislative change?
    - We cannot take on overall policy issues inside the IRP process.

Slides 12 & 13 - MODELING Energy Efficiency (EE) & Demand Response (DR)

Lunch

Slides 15-16 - Modeling Distributed Energy Resources (DERs)

1. Darrell Boggess - I would suggest we start next time with EV - for the ability to charge back into the grid. Are you looking at that?
    - We looked at that, but the challenge of a battery being used by the utility and prematurely degrading too soon has been an issue. We are not looking at it now, but we would be open to discussions.

2. Will Shields - could Stan answer the Gibson Plant close down?
    - The retirement has been approved, and the IRP process will provide the analysis to determine actual dates.

3. Kathleen McManus - What kind of aggregation happens with batteries?
    - While there are some benefits from small-scale DERs but cost-benefit is more challenging. The IRP process is continuous and will evolve. At the moment it is not assuming that there is aggregation.

4. Jason Frost - Are you looking at EV charging at different times of the day?
    - This is a very involved question. We will rely on the LBNL studies to provide guidance on charging times.

5. David Gard - In addition to the additional burden of EV charging - can we model the possible benefits.
    - Yes.

6. Mike Mullet - It is not embedded costs that matter is long term costs that we are modelling - we are modelling the new system, not the embedded cost of the old system - Much of the innovation to come is in the design.
    - We take a view of sunk cost, not embedded cost. We do look at incremental costs.

Slide 18 - What is a Scenario

1. Scott Park defines scenarios as "a possible future." While there are an infinite number of scenarios - we try to bring them down to a much more limited set

2. Will Shields - Are these scenarios derived from historical sources - 21st Century task force seemed to provide a good start.
    - These are new - but will honor the history and knowledge we have from that.

Slide 19 - Scenarios for 2021 IRP

1. Peter Boerger - Will you be building different hourly MISO price forecasts for these scenarios?
    - Yes.

2. Peter Boerger - Are you going to model constraints on imports in your modelling?
    - We plan to have sufficient resources but want to be able to take advantage of market opportunities – if there are constraints in the MISO system, these would be reflected in the analysis as they impact the price.

3. Peter Boerger - are the current constraints in importing?
    - We do not constrain the megawatt-hours that we could buy.

4. Will Shields - Are the tax incentives about coal?
    - No, the tax incentives referred to on this slide are exclusively solar and wind.

5. Devi Glick - What is your timeline for retirement for Edwardsport?
    - This is a portfolio question and will be addressed in the modeling.

6. Devi Glick - What are your assumptions about Cayuga?
    - This is more of a portfolio issue and will be addressed in the modeling.

7. Devi Glick- Are there studies about the cost of Cayuga to make sure that customers are not subsidizing the paper plant?
    - This deals with a customer special contract and will require a customer conversation and future IURC filing.

8. Devi Glick- Why are you using Burns and McDonnel et al. rather than publicly available sources?
    - We appreciate the quality and value that they bring in being able to access non-public data. We will refer to public data as well as the Guidehouse (formerly Navigant) and Burns and McDonnel.

9. Jennifer Washburn - Regarding Cayuga – Is Duke committed to getting into negotiations with the paper company?
    - I believe that is happening.

10. Jennifer Washburn - in the last IRP, we saw that transmission retirement was included. What is the stakeholder process in regard to transmission retirement scenarios - We are interested in involvement in these conversations.
    - This is TBD - We will look forward to these conversations.

11. Anna Sommers - We have seen the Burns and Mc documents, which overstate the cost of solar resources. I suggest that you use your existing data to estimate these costs.
    - We will have the Burns and McDonnell, Guidehouse and RFI data that will all be useful in providing input into the cost information.

12. Anna Sommers - Recommend scrapping "Current Conditions" scenario - these feel more like do nothing.
    - Thank you for the input, we will consider. The important thing is not the label.
    - Guidehouse, formerly Navigant, is our source for solar.

13. Alex Jorck - I am interested in your range of potential carbon tax impacts - minimum and maximum. I would encourage you to look at significantly more aggressive modelling.
    $5 initially and building steadily over time - We welcome stakeholders to bring their own assumptions.

14. Leslie Webb - How will we include projected temperature changes?
    - We include that as a sensitivity.

15. Mike Mullet - This chart (scenarios) is very significant - as the project continues, can we expect to see the chart evolving and continuously updated? What about 45Q impact?
    - We will keep the chart updated and current, as well as the spreadsheet data behind each scenario. Regarding 45Q, "We have not got there yet."

16. Simon Lomax - Regarding Small modular reactors - when are you saying this might be commercially available?
    - We don't have an estimate on their availability, and we will only model it when we are comfortable with that estimate.

17. Simon Lomax- Where do the Duke Energy 2030 and 2050 goals fit into the scenarios? Are 2030 and 2050 already baked into the reference scenarios?
    - These are really portfolio questions,

18. Susan Schechter – I request adding "stakeholder outrage" to your models as a sensitivity!

19. Ray Wilson - I know that Duke operates in many other jurisdictions. Don't we already have the right answers? How are we different here in Indiana?
    - The short answer is we are different in almost every way. Geography, regulation, weather, economy, legal regime, customer profile, assets etc. It is important that we model Indiana as Indiana.

20. Will Shields - Does your CEO support a Carbon Tax?
    - Yes

21. Will Shields - is the company aware of where we hit the point of no return?
    - We are not sure there is a consensus on when that point would be.

22. Karl Boothman - I see you are only modelling CO_2. What about SOX, NOX and particulates?
    - A carbon tax is acting as a proxy for all of this. We are looking forward to the Biden climate planning to be able to understand the particulars.

23. Karl Boothman - Could you tell us if there are other externalities (downstream impacts) that are involved in your modelling? - health etc
    - We do not do work with those other externalities.

Slide 20 – 21 Nate Gagnon – Demo of Portfolio Modelling Tool

1. Simon Lomax - What is the midpoint goal, and how does it compare to Duke commitments?
    - The tool is not trying to hit any particular outcome. It is allowing users to see what outcomes would be produced with different portfolios.

2. Simon Lomax - what does the growth curve look like for EVs?
    - We are assuming a relatively heavy level (90%) of adoption of medium and light vehicles sales by 2030.

3. Simon Lomax - are you able to quantify the impact on load of EV adoption?
    - We estimate that this would hit about 50% above the load today – this is very significant.

4. Simon Lomax - is that pretty consistent across the utility sector?
    - We have not looked specifically, but we find this likely high.

5. Anna Sommers - the winter period you have was in the winter vortex - will you show an average?
    - We wanted to show a challenging load period since we need to serve that as well as the average.

6. Anna Sommers - ok great - but you should be open about what you are modelling, so people are not misled.

7. Anna Sommers - You seem to have excluded energy efficiencies - this is missing in the tool.
    - Energy efficiency is built into the load forecasts that underly the tool.

8. Nathan Rues - Does this account for demand response
    - Yes - there is a snapback calculation to account for having to “recharge” the DR

9. Nathan Rues - Is the demand response adaptable?

- No

10. Nathan Rues - How does cost get built into this?
    - The tool is about speculating portfolios and their fit. Once a portfolio is defined it can then be put into the IRP model which would produce the cost results.

11. Mike Mullet - Will this tool evolve in the process or is it fixed?
    - It is fixed for this IRP cycle. It will probably evolve after this cycle to have it remain as a relevant tool.

12. Mike Mullet - This looks like a natural way to have the market tell you how to solve a problem.
    - I think that is definitely worth exploring, but it has complexities that are beyond the scope of this tool.

13. Mike Mullet - I think it would be a big mistake to ignore the potential value.

14. Will Shields - Will this tool be able to follow the costs?
    - There are no costs included in the tool. It is a simple tool to help develop and review portfolio changes and how those changes meet the load requirements.

15. Darrel Boggess - Appreciating the simplicity of this tool, is the planning model similar?
    - Yes - but much more complex.

16. Jeff Haverly - Baseload to achieve carbon-neutral is likely only available through advanced nuclear.

17. Leslie Webb - very cool tool and shows how complex this task is.

18. Leslie Webb - We are ignoring the question of "Point of No Return."

19. Leslie Webb - We need to see short term progress which you called near term actions - we need action now - Duke has the dirtiest coal planets - Which is the most aggressive scenario to get rid of those coal plants?
    - That is a portfolio question, and we will be into that question in June.

20. Mike Mullet – Is the next meeting on June 21?

21. Yes

22. Susan Schechter - the bottom line is we are all asking about climate being the drivers - are you hearing us?
    - Yes.

23. Darrell Boggess - this whole process with 100 people involved is a vast improvement - I feel like Duke is positioned with the ability and the skills to provide what we are looking for AND to provide leadership - I can hope that in the future, I will be able to say that Duke stepped up and made a difference.

Wrap up







2021 Integrated Resource Plan
Stakeholder Workshop #4

June 21, 2021

Agenda

9:30	Welcome, Protocols & Timeline
9:40	Change in Approach & Introductions
9:55	Follow-ups from previous meetings
	-Climate Change Load Forecast
	-Portfolio Tool
10:15	Overview of Scenarios
10:30	Scenario Deep Dives
	-Reference with and without CO_2 Reg;
	-Current Conditions (Low gas)
12:00	Lunch break
1:00	Scenario Deep Dives
	-Current Conditions (High gas)
	-Deep Decarbonization/Rapid Electrification
	-Biden Climate Plan placeholder
2:30	Connecting Scenarios to Portfolios
2:50	Wrap up

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ROAD MAP FOR IRP STAKEHOLDER PROCESS

Workshop 1 Nov. 20, 2030	Workshop 2 Jan. 21, 2021	Workshop 3 April 21, 2021	Workshop 4 June 21, 2021	Workshop 5 August 2021	Workshop 6 Sept. 2021	Workshop 7 Oct. 2021
✓ Goals of IRP ✓ Review of 2018 IRP ✓ Contemplated changes for 2021 ✓ Load Forecasting, including: • Energy efficiency (EE) • Electric vehicles (EVs) • Distributed Energy Renewables (DERs)	✓ Recap ✓ Follow-ups: • Climate change load forecast ✓ Scenario intro ✓ AMI data ✓ Customer Programs ✓ DERs	✓ Recap ✓ Follow-ups: • Climate change load forecast • Request for Information ✓ EE and demand response (DR) modeling ✓ Scenario update ✓ Portfolio creation tool	➢ Follow-ups: • Climate change load forecast • Portfolio tool ➢ Deep dive on scenario assumptions ➢ Connecting scenarios to portfolios	➢ Follow-ups ➢ EE Bundling/ DR deep dive ➢ Retirement analysis ➢ Scorecard ➢ Optimized portfolio results for each scenario ➢ Hybrid and Stakeholder portfolios initial discussions	➢ Follow-ups ➢ Modeling results on sensitivities ➢ Hybrid and Stakeholder portfolios modeling results	➢ Follow-ups ➢ Scorecard ➢ Preferred portfolio and short term action plan

Stakeholder scenarios due by July 23

Stakeholder portfolios due by August 31

Evening Q&A Sessions for Customers	
January 20, 2021	Late July 2021

Ongoing technical meetings and data provision

Change in Approach

- Due to the increased level of participation and diversity of stakeholders, we tailored the delivery of the IRP stakeholder meetings to be accessible to more stakeholders
- We have decided to change approach to serve stakeholders of different levels of knowledge
  - Day long meetings will take on a more detailed and technical tone
  - An evening stakeholder meeting will be scheduled and be held with customers in mind
  - Stakeholders are free to attend both meetings

<u>Why the platform change of MS-Teams to Zoom?</u>

- More effective prioritization of stakeholder questions and comments
- Ability to manage multiple questions at the same time
- Easier documentation of stakeholder contributions
- Please use Q&A to ask questions during a presentation section

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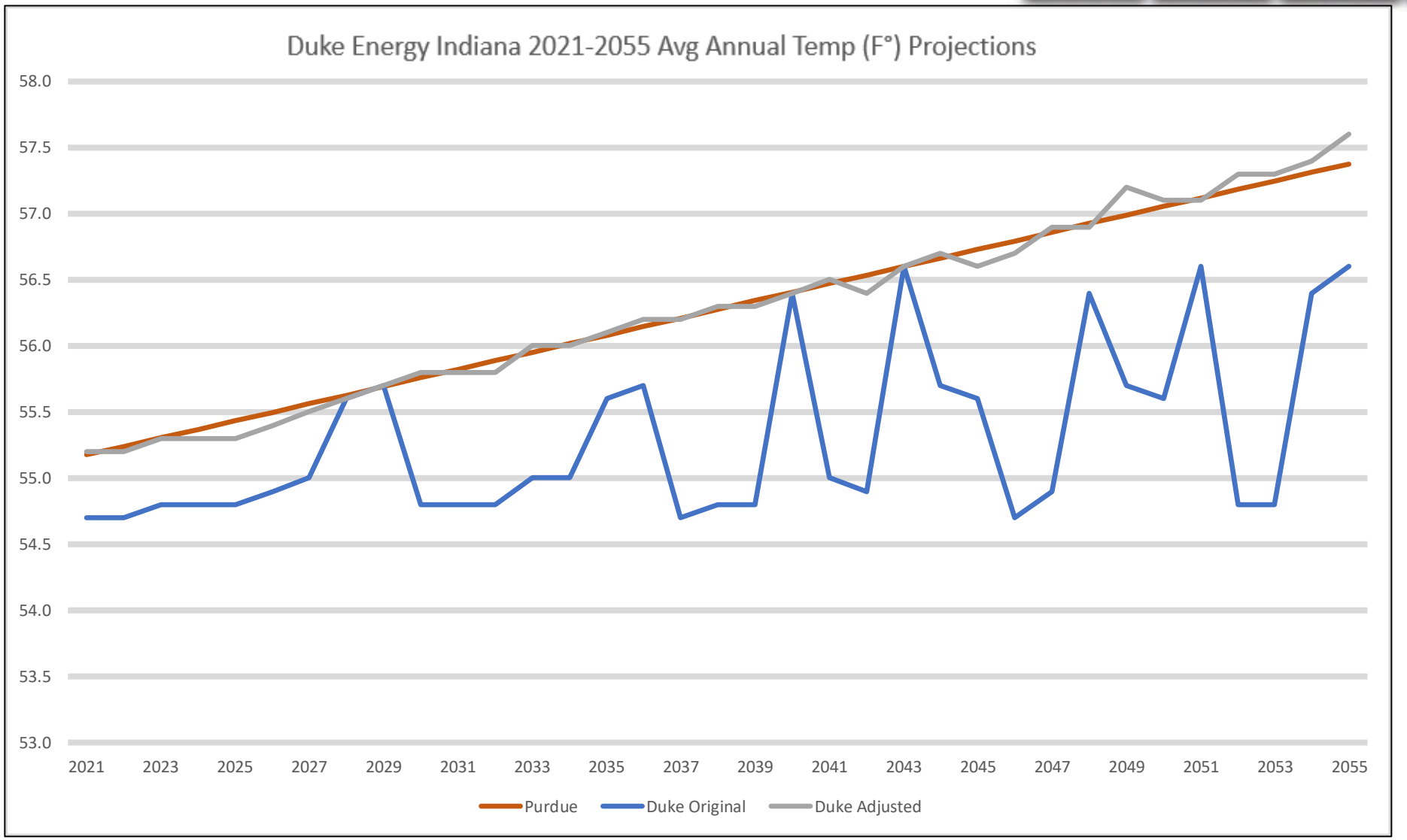
Climate Change Load Forecast

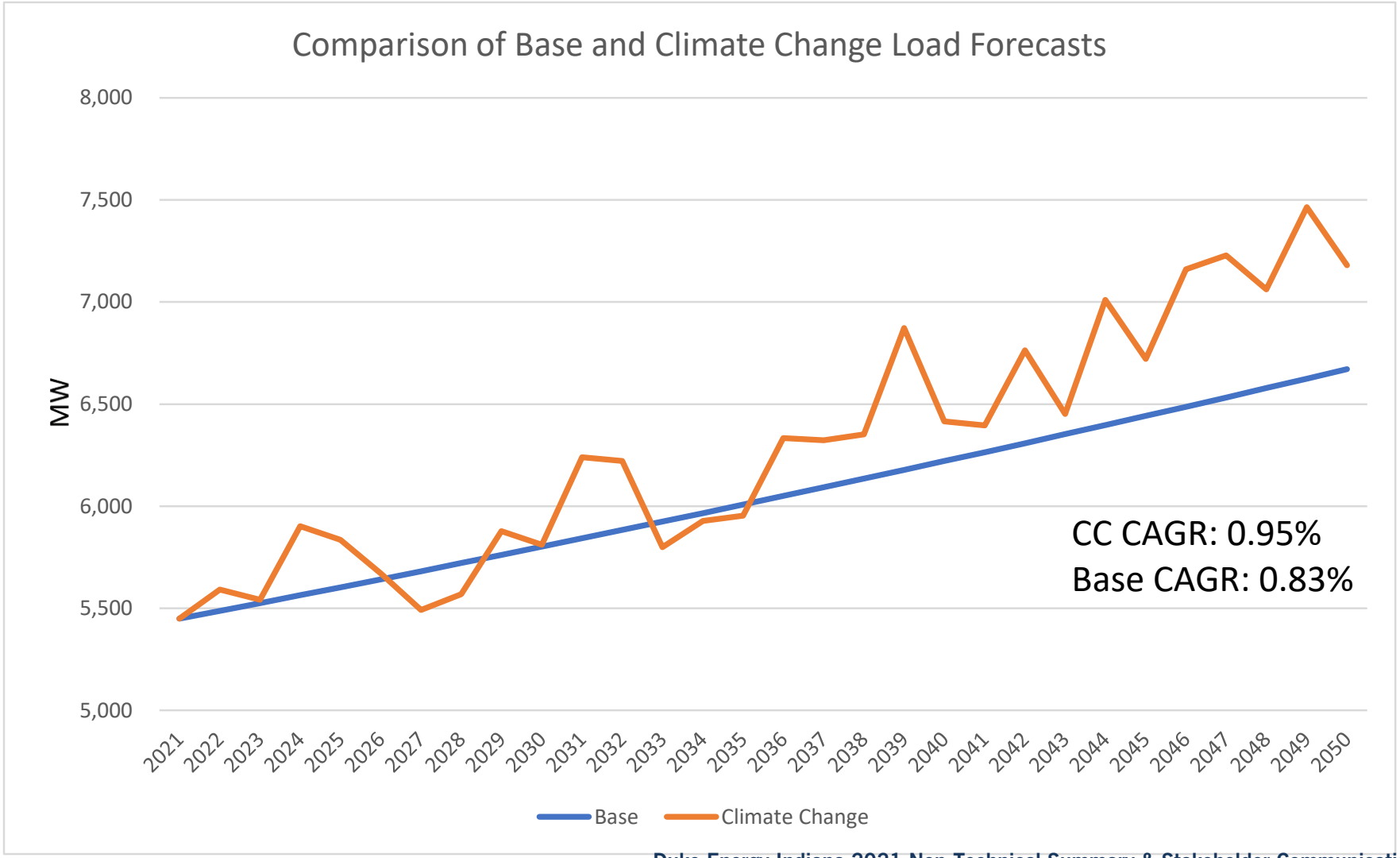
Load Forecasting considering climate change

- Based on feedback from stakeholders, we have been working with the Purdue Climate Change Center to develop a load forecast that considers climate change
- This was developed by:
  - Creating a new weather forecast that includes temperature and dew point, based on Purdue's models
  - Historical correlations between weather (temp and humidity) and system load were used to translate Purdue model results to load
- Climate Change Load Forecast may be used in a Stakeholder Scenario and will be used by DEI in Sensitivity analyses

Climate Change Temperature Forecast



Climate Change Load Forecast



Portfolio Tool

- Follow up meeting was held on June 4th for stakeholders who had questions about the use of the Portfolio tool

- Portfolio tool may be used to prepare for Aug meeting where stakeholders can:
  - Design their own portfolio; or
  - Provide DEI with an energy mix under a specific scenario and DEI will develop a resource plan that has those characteristics

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  - Needs to include specific assumptions that can be entered into models
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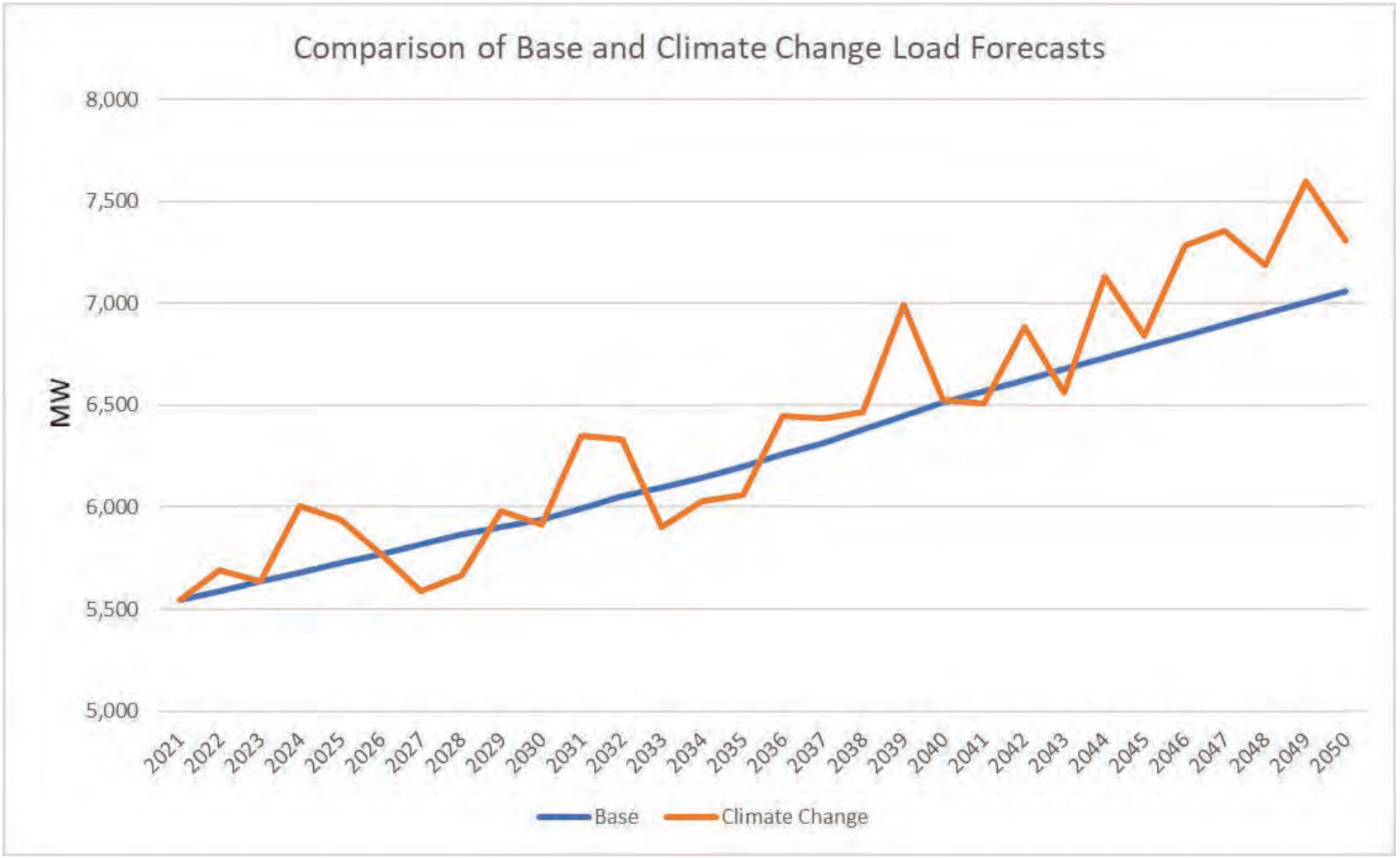
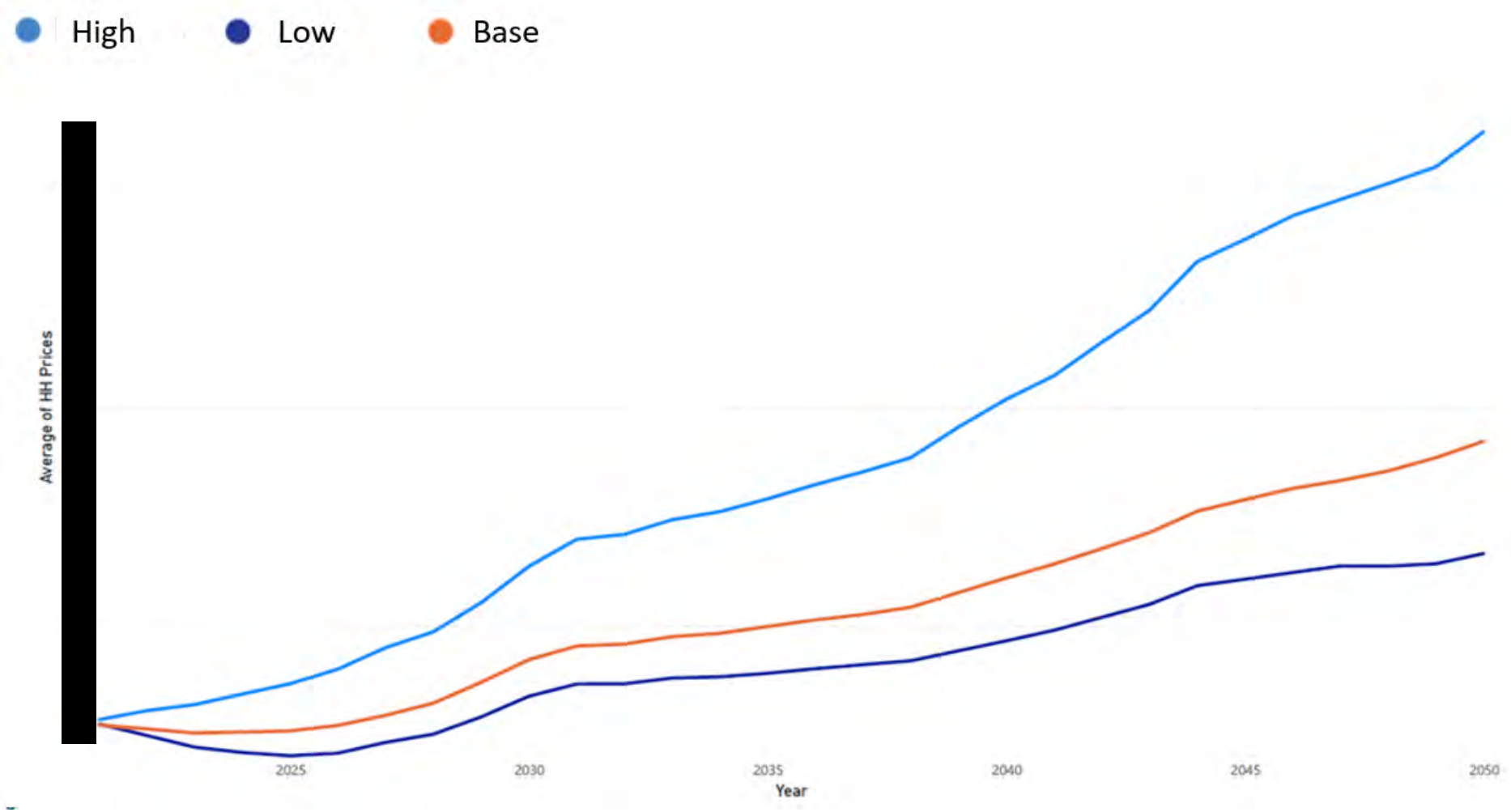
SENSITIVITIES
Cost of New Gen (RFI, Others?)
DSM Escalation
Climate Change Load Forecast
MISO ACAP construct
Others?

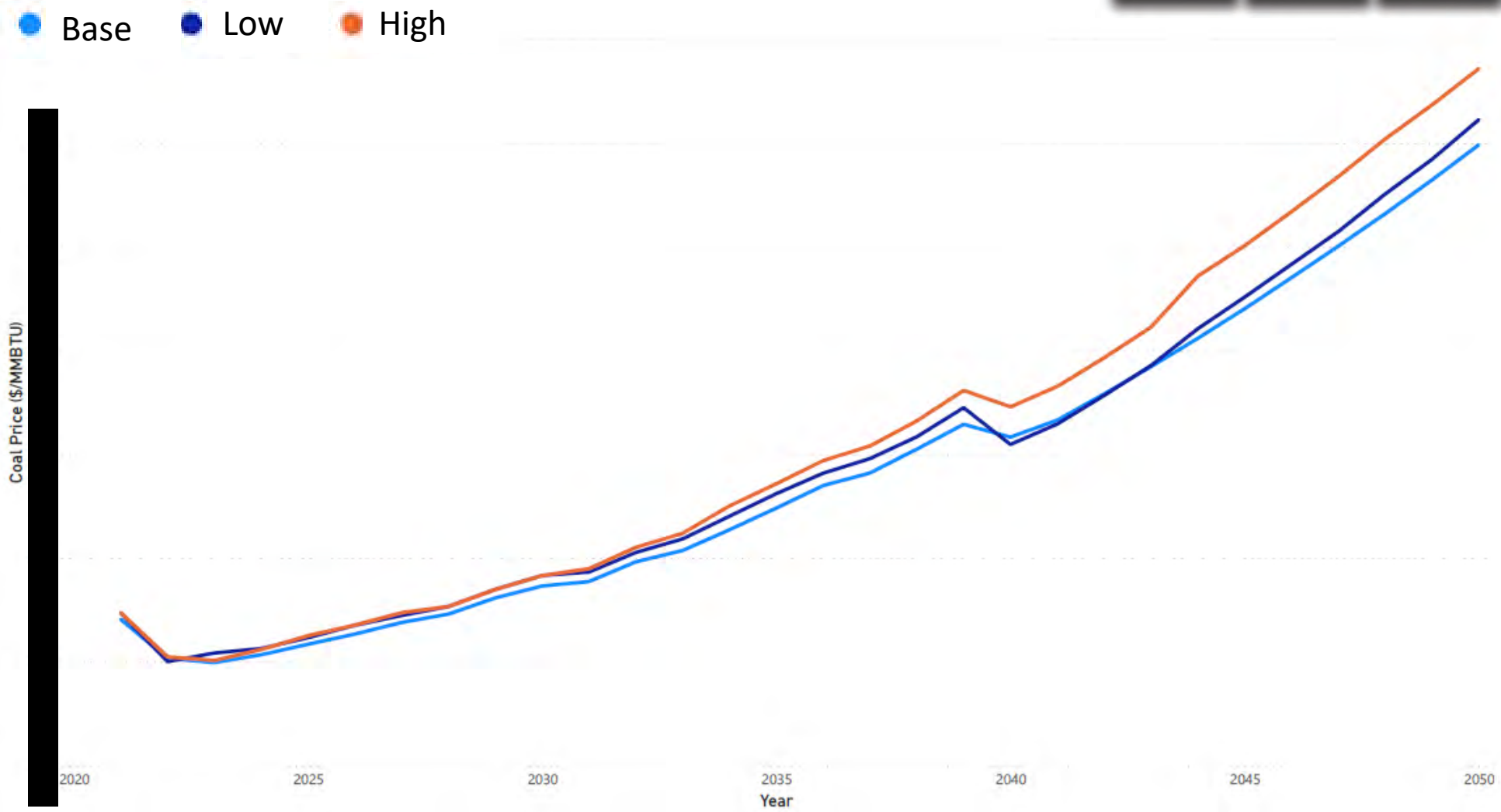
Load Forecasts



Gas Forecasts



Coal Price Forecasts



Carbon Tax Forecast

2

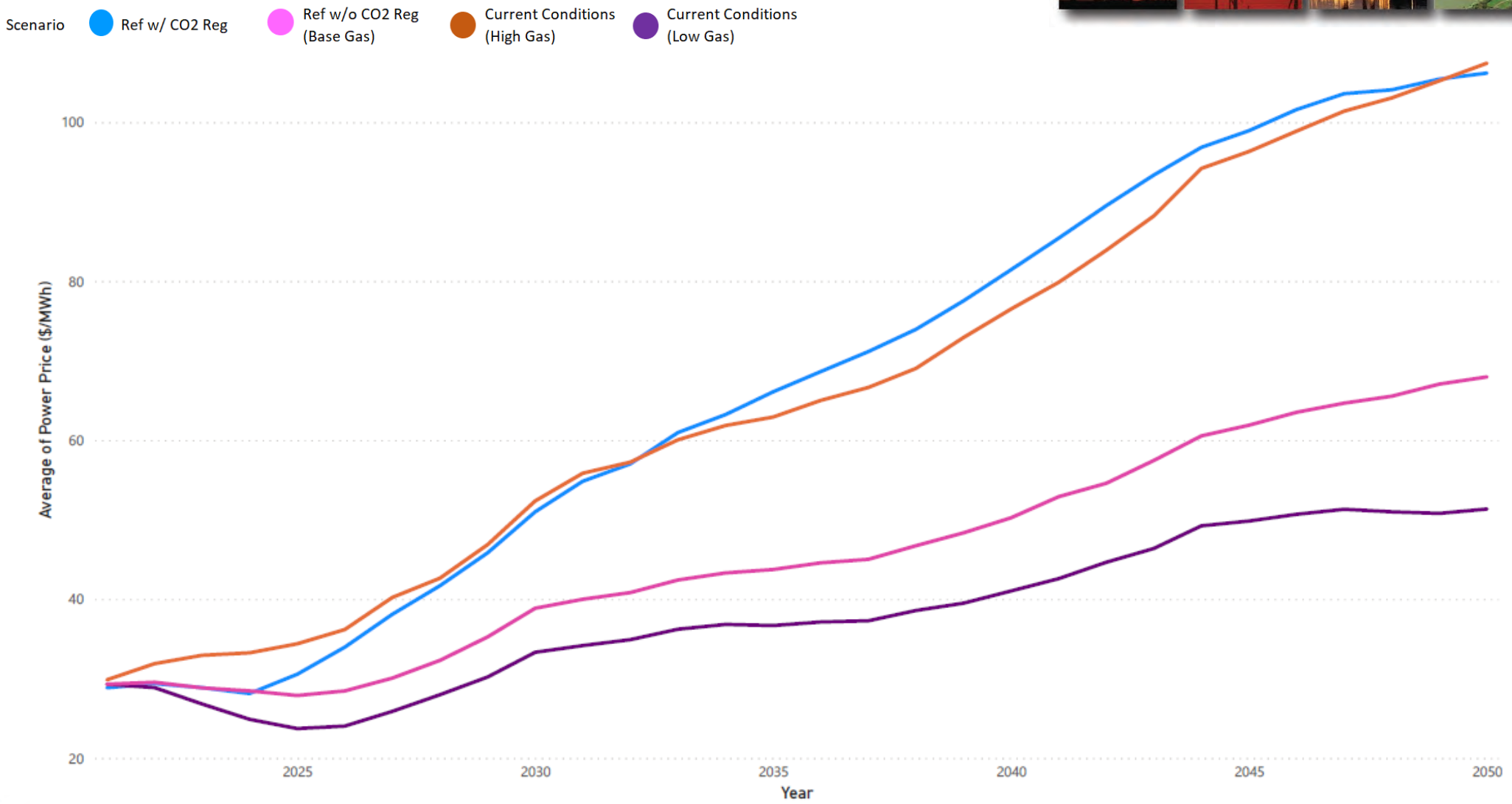
- A CO_2 tax is one form of carbon regulation
- We will also look at two scenarios with different mass cap approaches
  - Deep Decarbonization/Rapid Electrification
  - Biden Climate Plan

$140
$120
$100
$80
$60
$40
$20
$0

2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050

DUKE ENERGY

Power Price Forecasts



Cost of New Generation

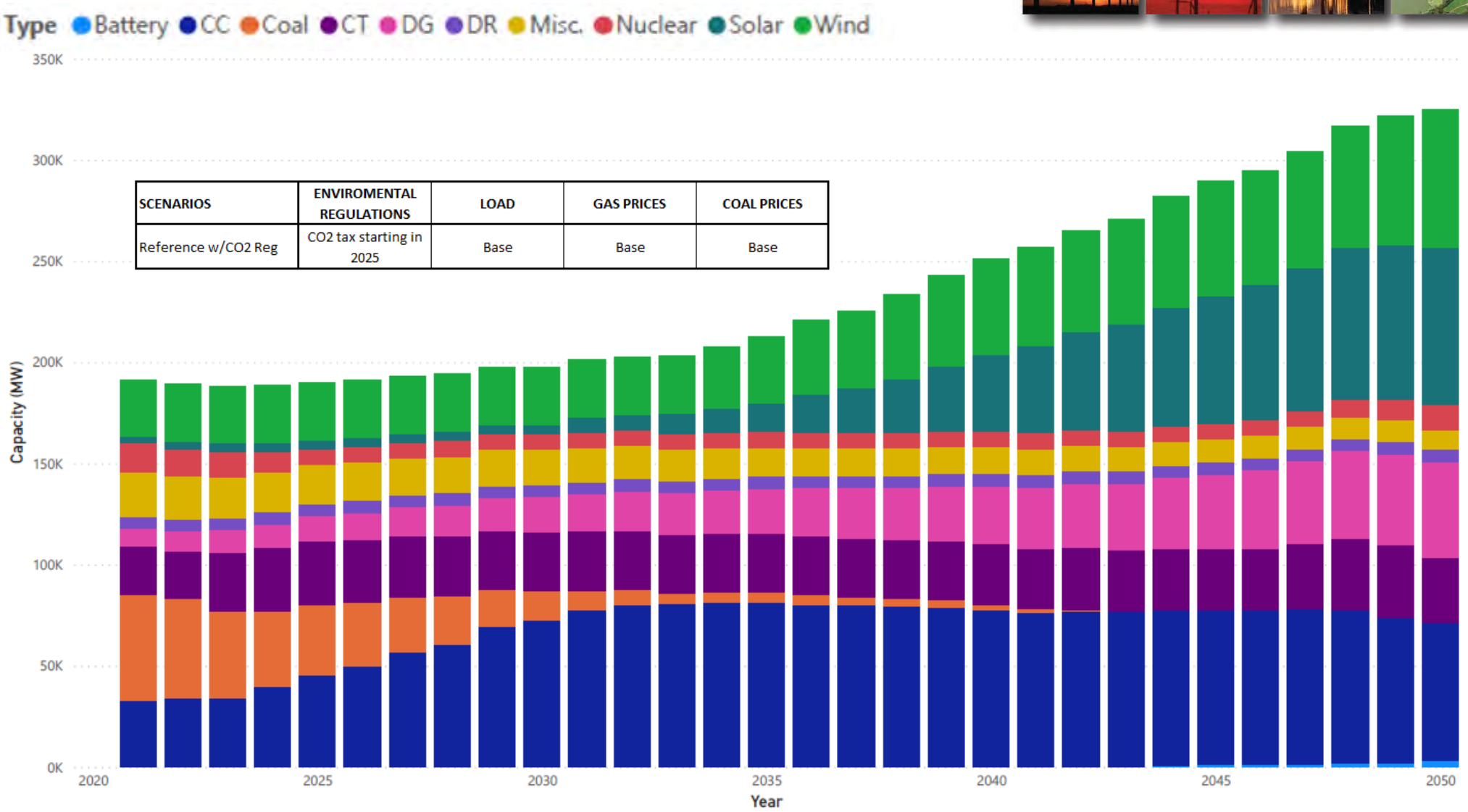
Source	Cost and Performance Characteristics of New Generating Technologies - AEO 2021

Techology	Size (MW)	Overnight Cost ($/kw)	VOM ($/MWh)	FOM ($/kw-yr)	Heat Rate (MMBtu/MWh)		B&M and Guidehouse costs relative to AEO 2021 Costs
Combined Cycle	1083	957	1.88	12.26	6.37		Lower capital costs; similar operations
Combustine Turbine	237	709	4.52	7.04	9905		Lower capital costs; less efficient
Nuclear	600	6183	3.02	95.48	10455		Lower capital costs; less efficient
Battery	50	1165	0	24.93	N/A		Higher capital costs; lower ongoing costs
Wind	200	1846	0	26.47	N/A		Lower costs; higher ongoing costs
Solar w/Tracking	150	1248	0	15.33	N/A		Higher capital costs; lower ongoing costs
Solar w/Storage	150	1612	0	32.33	N/A		Higher capital costs; higher ongoing costs

Scenario Modeling

- Given the interrelated nature of the MISO market, changing the assumptions of a variable affects the capacity mix and dispatch of the MISO fleet
- In order to account for the impacts, we model the MISO market through 2050
- The next section of the presentation will show for each scenario:
  - MISO capacity mix over time
  - MISO energy mix over time
  - Resulting power price forecast

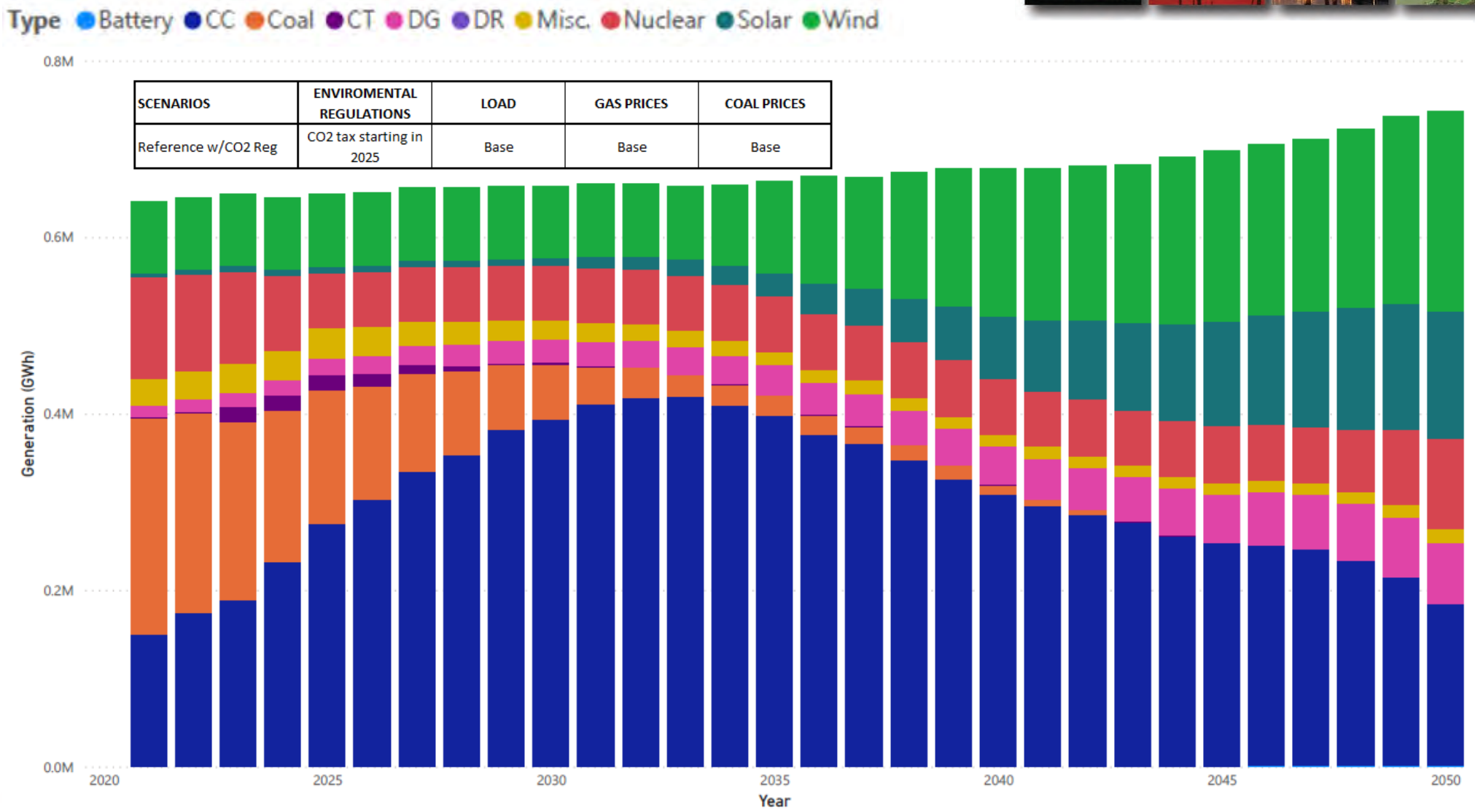
Reference w/ CO_2 Tax (MISO Capacity Mix)



SCENARIOS	ENVIROMENTAL REGULATIONS	LOAD	GAS PRICES	COAL PRICES
Reference w/CO2 Reg	CO2 tax starting in 2025	Base	Base	Base

Reference w/CO_2 Tax (MISO Energy Mix)

SCENARIOS	ENVIROMENTAL REGULATIONS	LOAD	GAS PRICES	COAL PRICES
Reference w/CO2 Reg	CO2 tax starting in 2025	Base	Base	Base

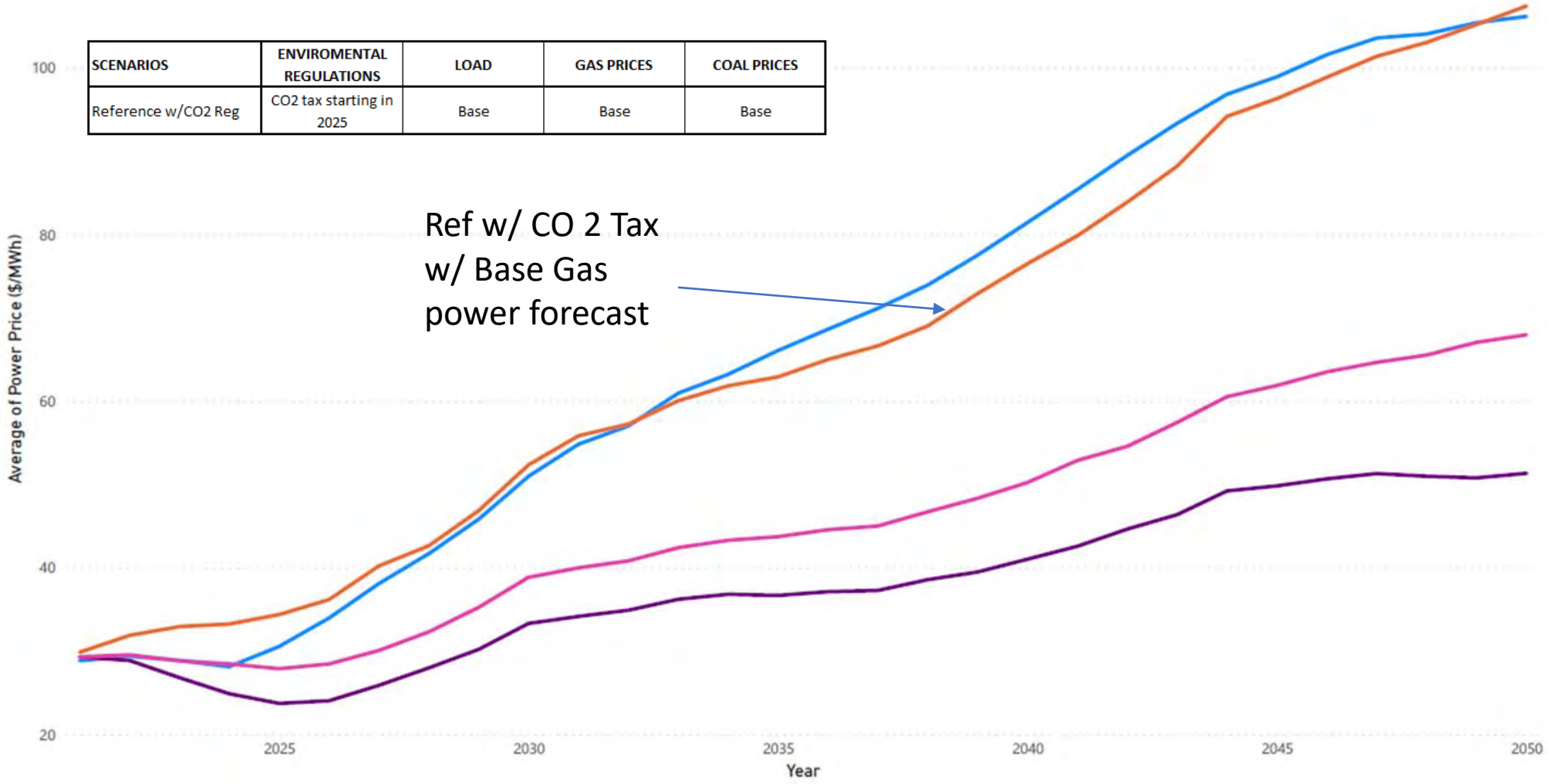


Reference w/CO_2 Tax (MISO Power Prices)

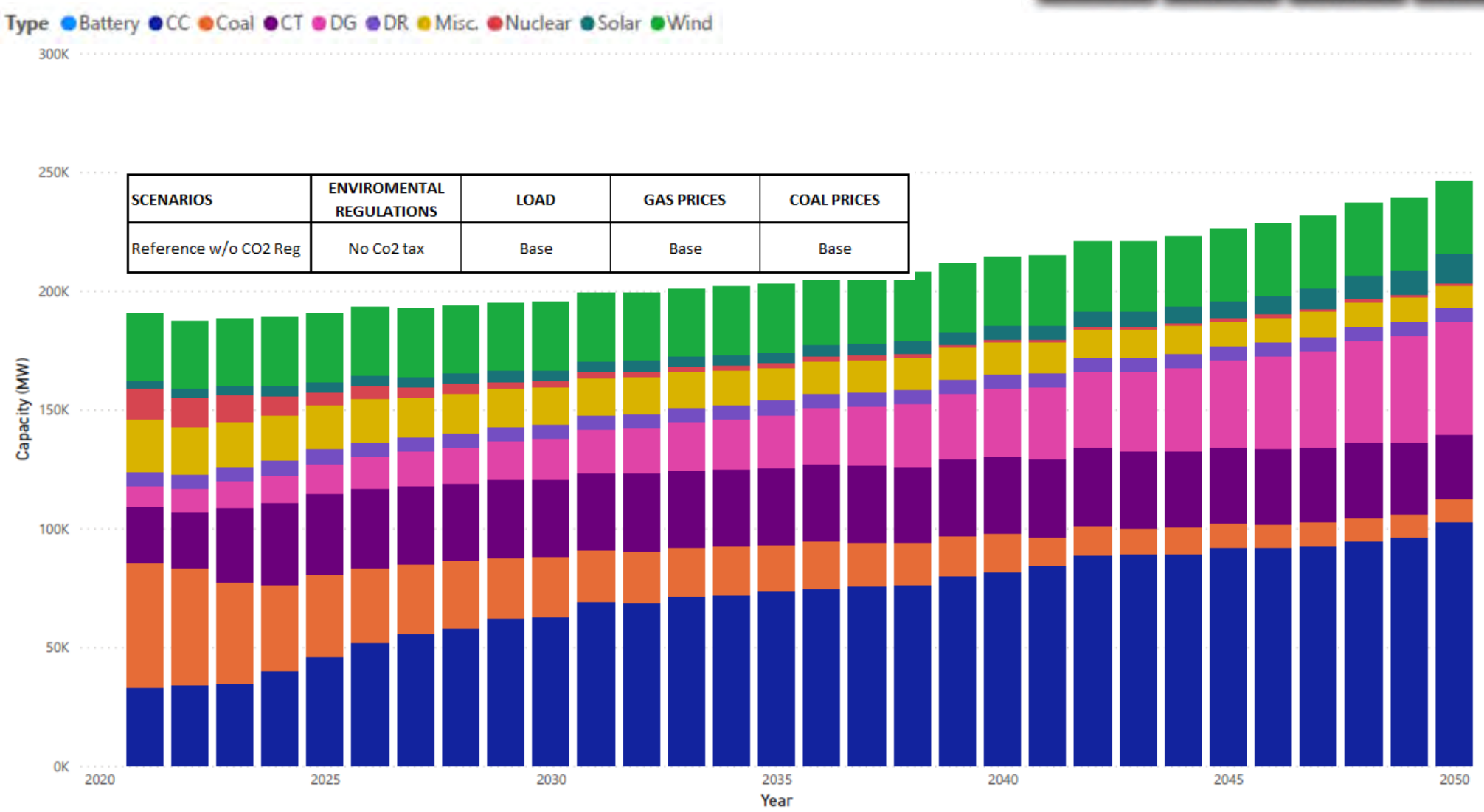
Scenario: Ref w/ CO2 Reg; Ref w/o CO2 Reg (Base Gas); Current Conditions (High Gas); Current Conditions (Low Gas)

SCENARIOS	ENVIROMENTAL REGULATIONS	LOAD	GAS PRICES	COAL PRICES
Reference w/CO2 Reg	CO2 tax starting in 2025	Base	Base	Base

Ref w/ CO 2 Tax w/ Base Gas power forecast



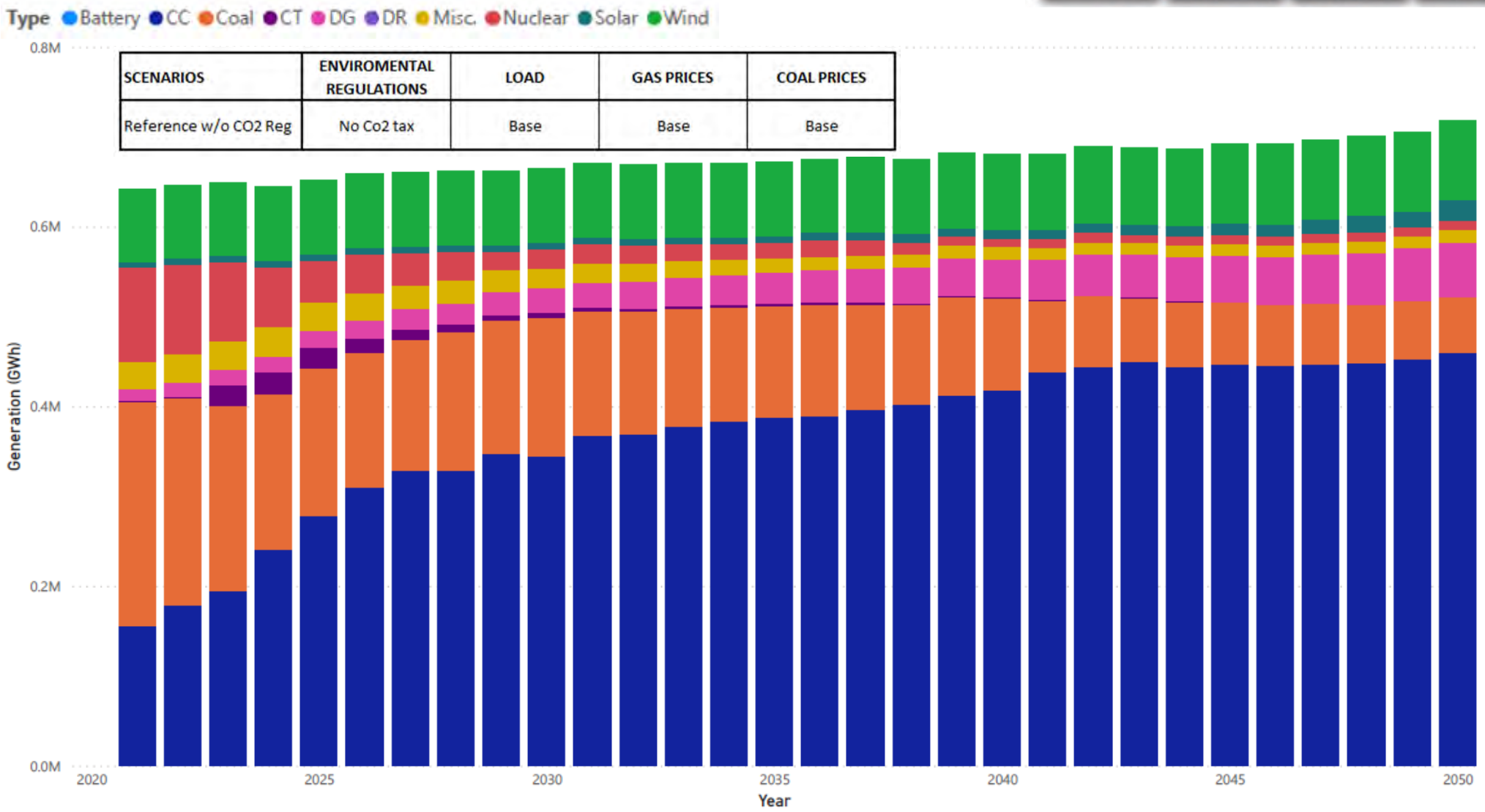
Reference w/o CO_2 Tax (MISO Capacity Mix)



SCENARIOS	ENVIROMENTAL REGULATIONS	LOAD	GAS PRICES	COAL PRICES
Reference w/o CO2 Reg	No Co2 tax	Base	Base	Base

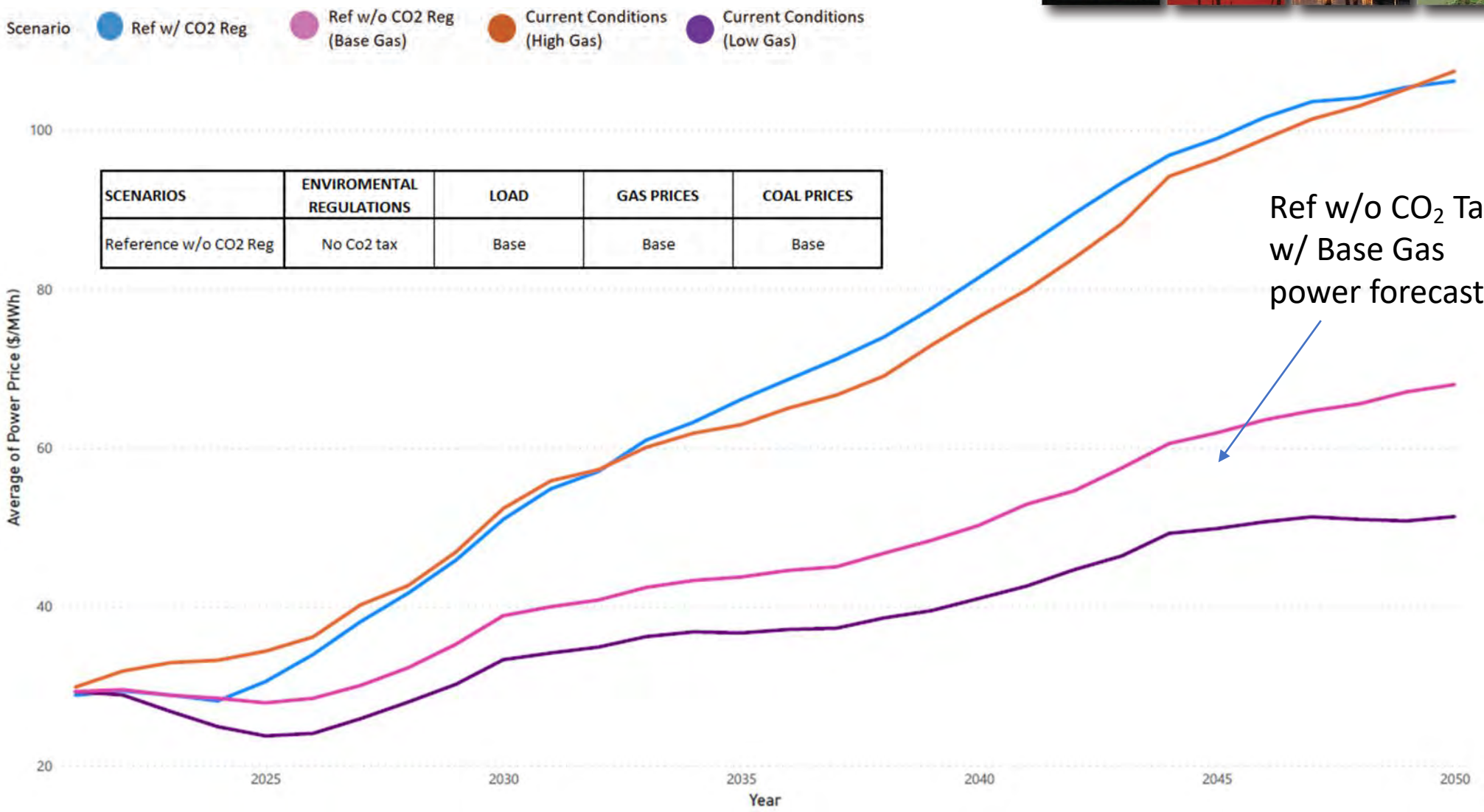
Reference w/o CO_2 Tax (MISO Energy Mix)

SCENARIOS	ENVIROMENTAL REGULATIONS	LOAD	GAS PRICES	COAL PRICES
Reference w/o CO2 Reg	No Co2 tax	Base	Base	Base



Reference w/o CO_2 Tax (MISO Power Prices)

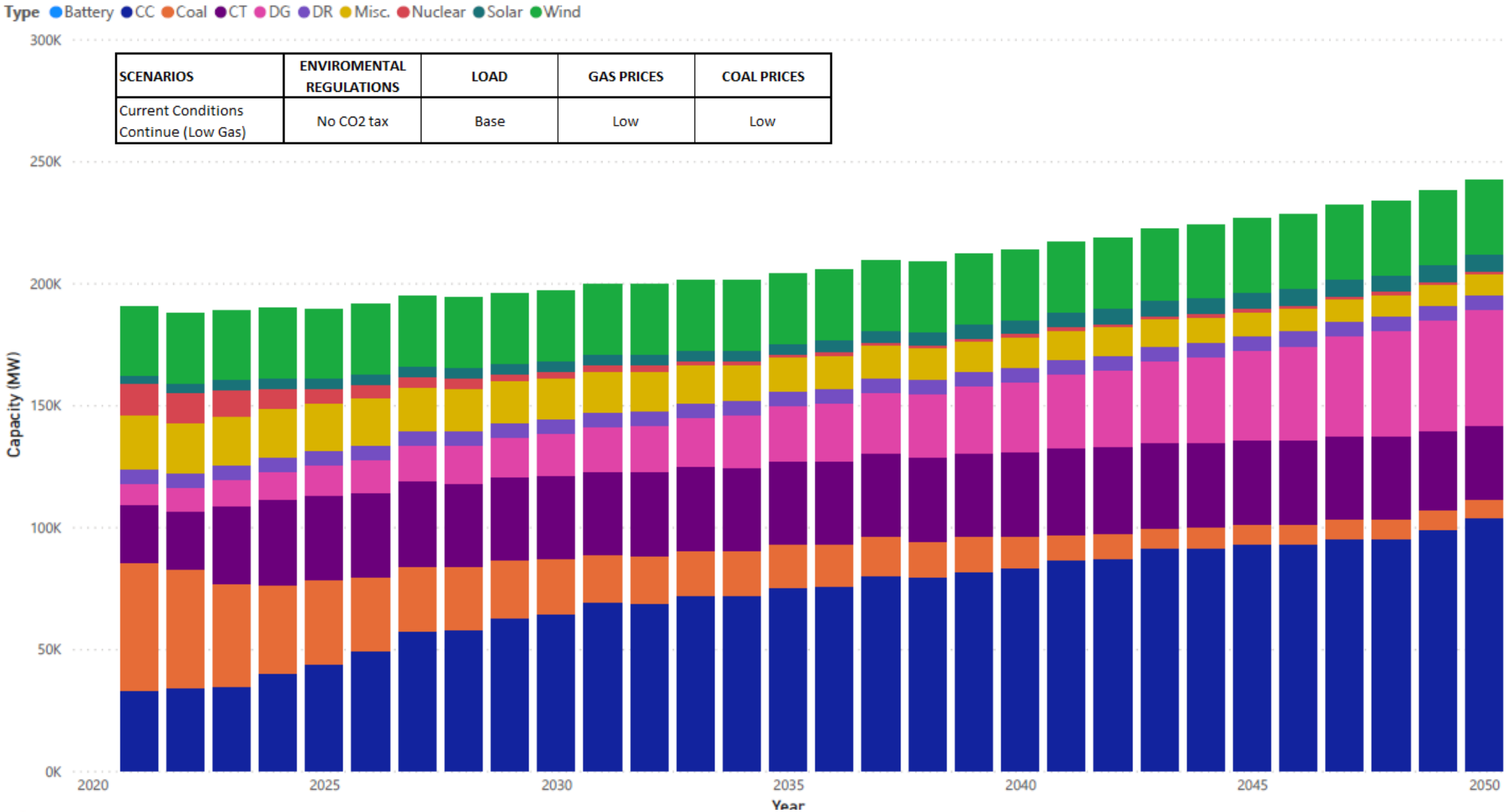
SCENARIOS	ENVIROMENTAL REGULATIONS	LOAD	GAS PRICES	COAL PRICES
Reference w/o CO2 Reg	No Co2 tax	Base	Base	Base



Ref w/o CO_2 Tax w/ Base Gas power forecast

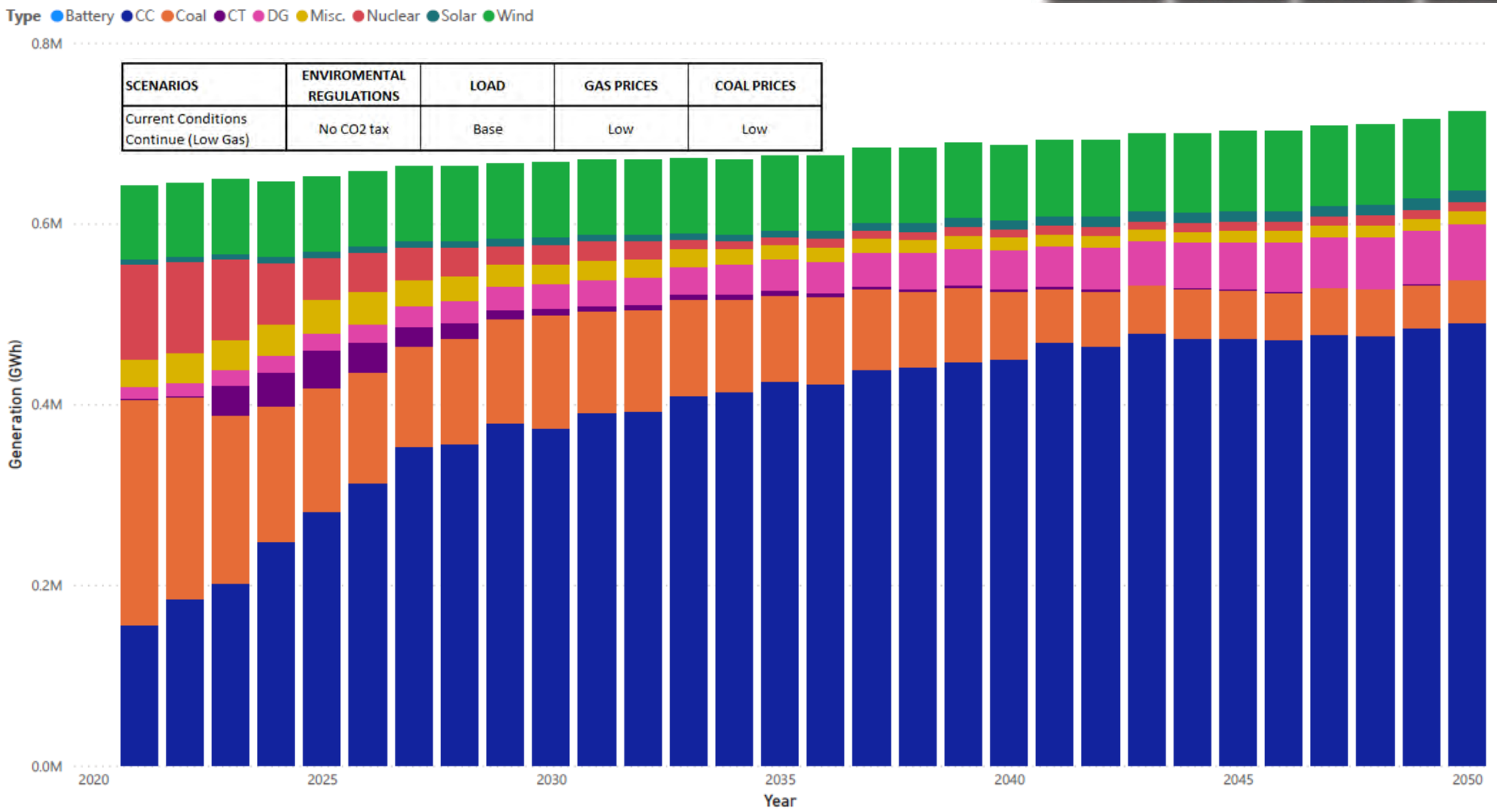
Current Conditions w/ Low Gas (MISO Capacity Mix)

SCENARIOS	ENVIROMENTAL REGULATIONS	LOAD	GAS PRICES	COAL PRICES
Current Conditions Continue (Low Gas)	No CO2 tax	Base	Low	Low



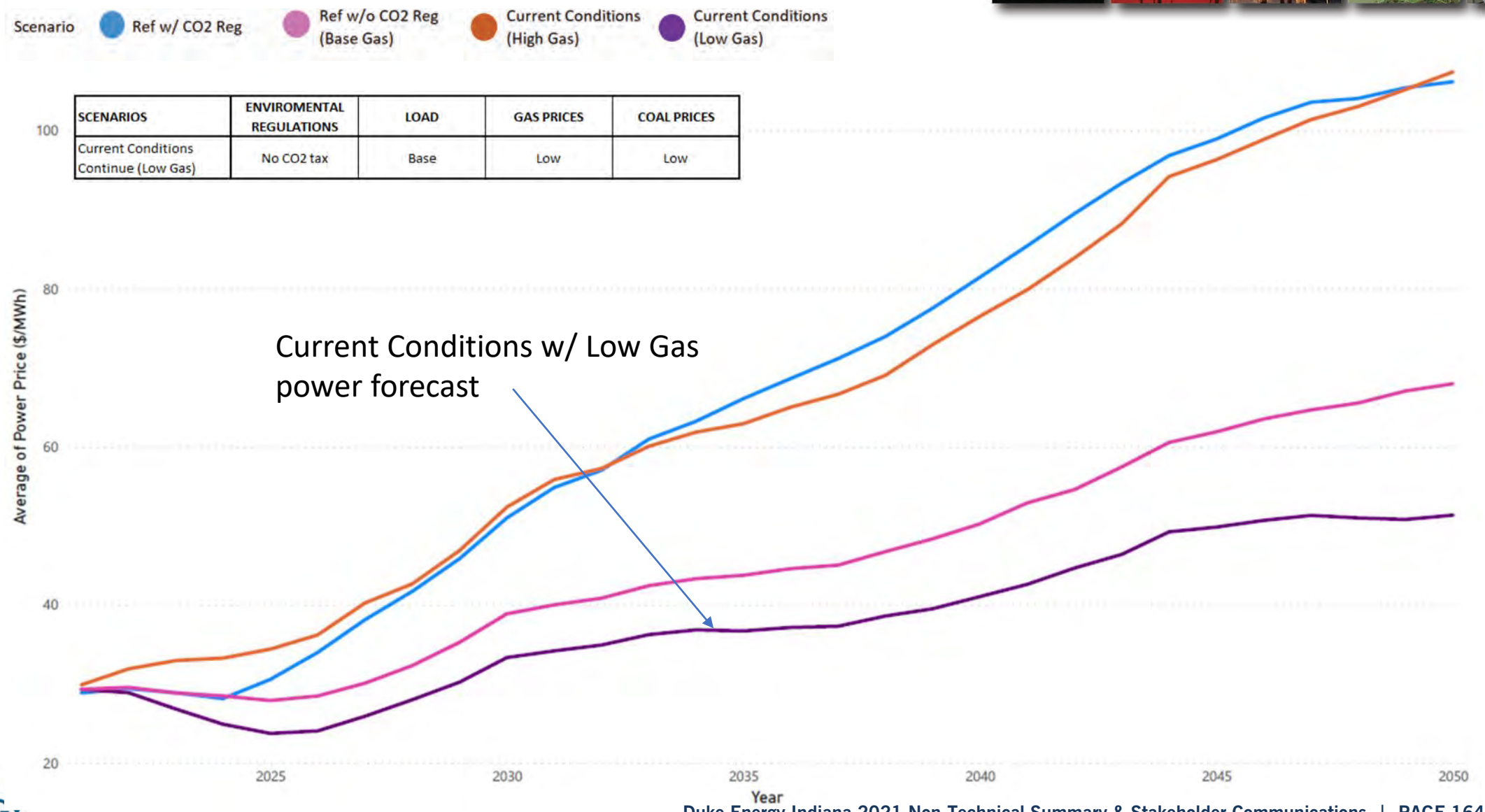
Current Conditions w/ Low Gas (MISO Energy Mix)

SCENARIOS	ENVIROMENTAL REGULATIONS	LOAD	GAS PRICES	COAL PRICES
Current Conditions Continue (Low Gas)	No CO2 tax	Base	Low	Low



Current Conditions w/ Low Gas (MISO Power Prices)

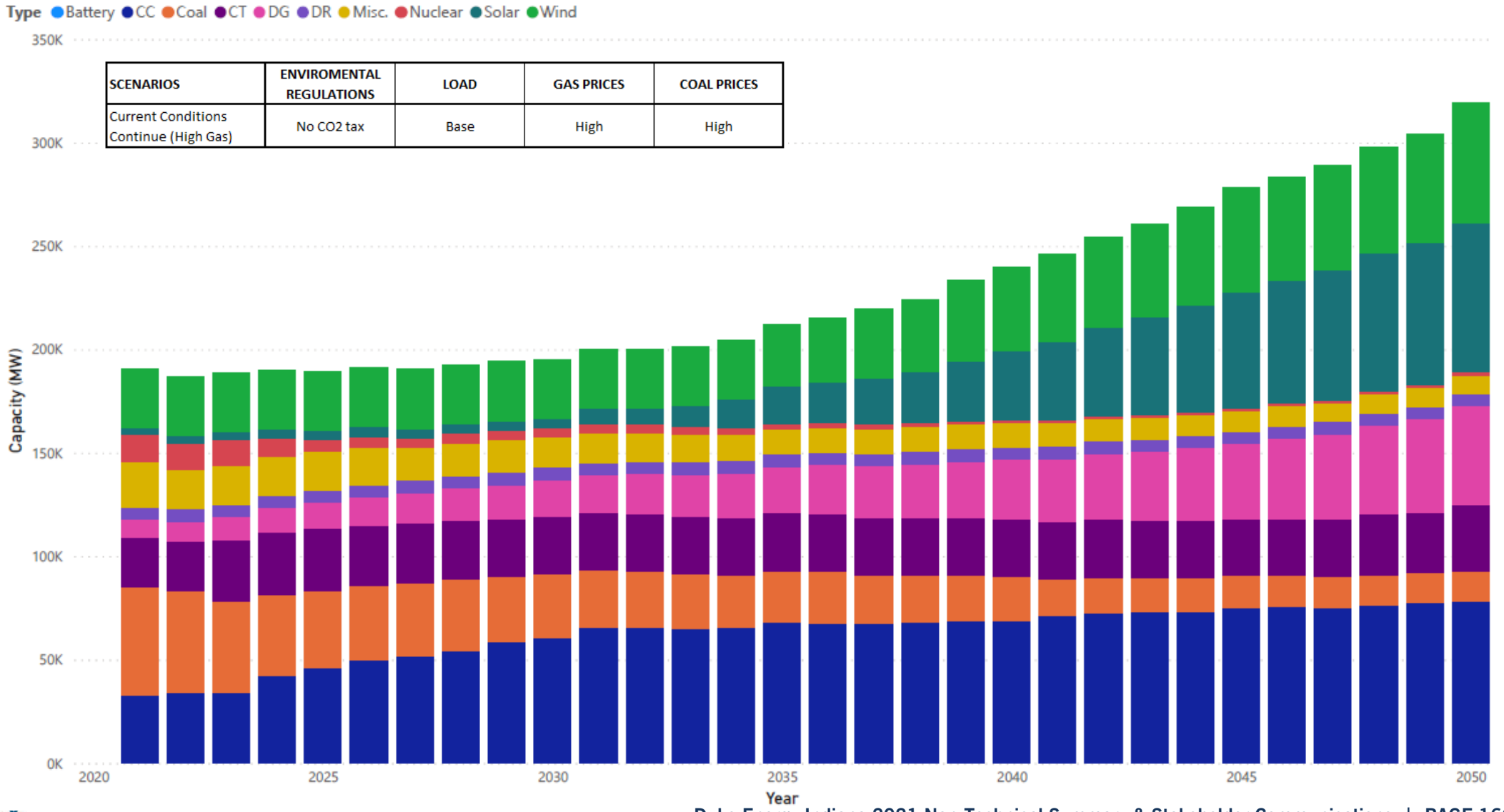
SCENARIOS	ENVIROMENTAL REGULATIONS	LOAD	GAS PRICES	COAL PRICES
Current Conditions Continue (Low Gas)	No CO2 tax	Base	Low	Low



Lunch

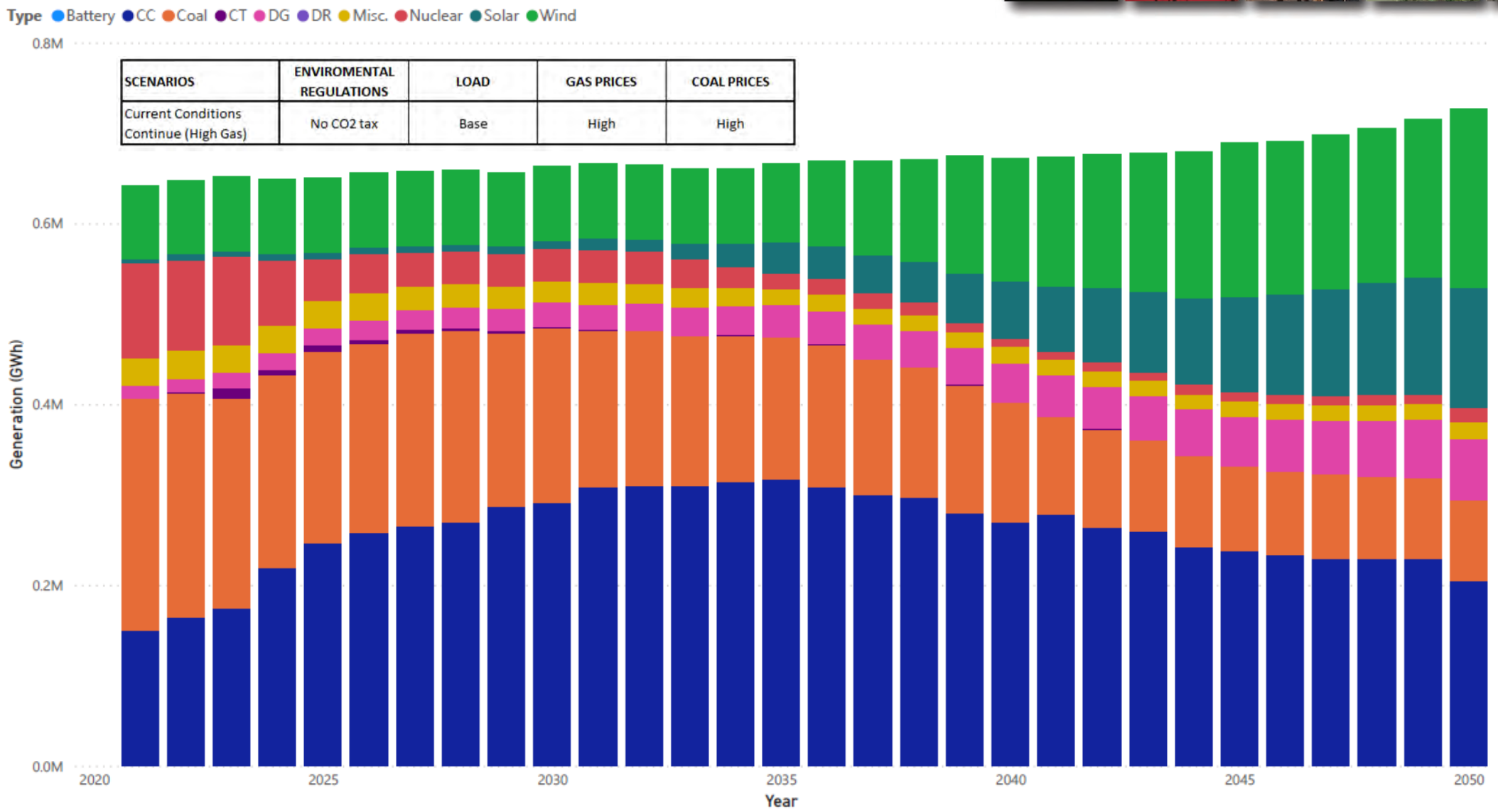
Current Conditions w/ High Gas (MISO Capacity Mix)

SCENARIOS	ENVIROMENTAL REGULATIONS	LOAD	GAS PRICES	COAL PRICES
Current Conditions Continue (High Gas)	No CO2 tax	Base	High	High



Current Conditions w/ High Gas (MISO Energy Mix)

SCENARIOS	ENVIROMENTAL REGULATIONS	LOAD	GAS PRICES	COAL PRICES
Current Conditions Continue (High Gas)	No CO2 tax	Base	High	High

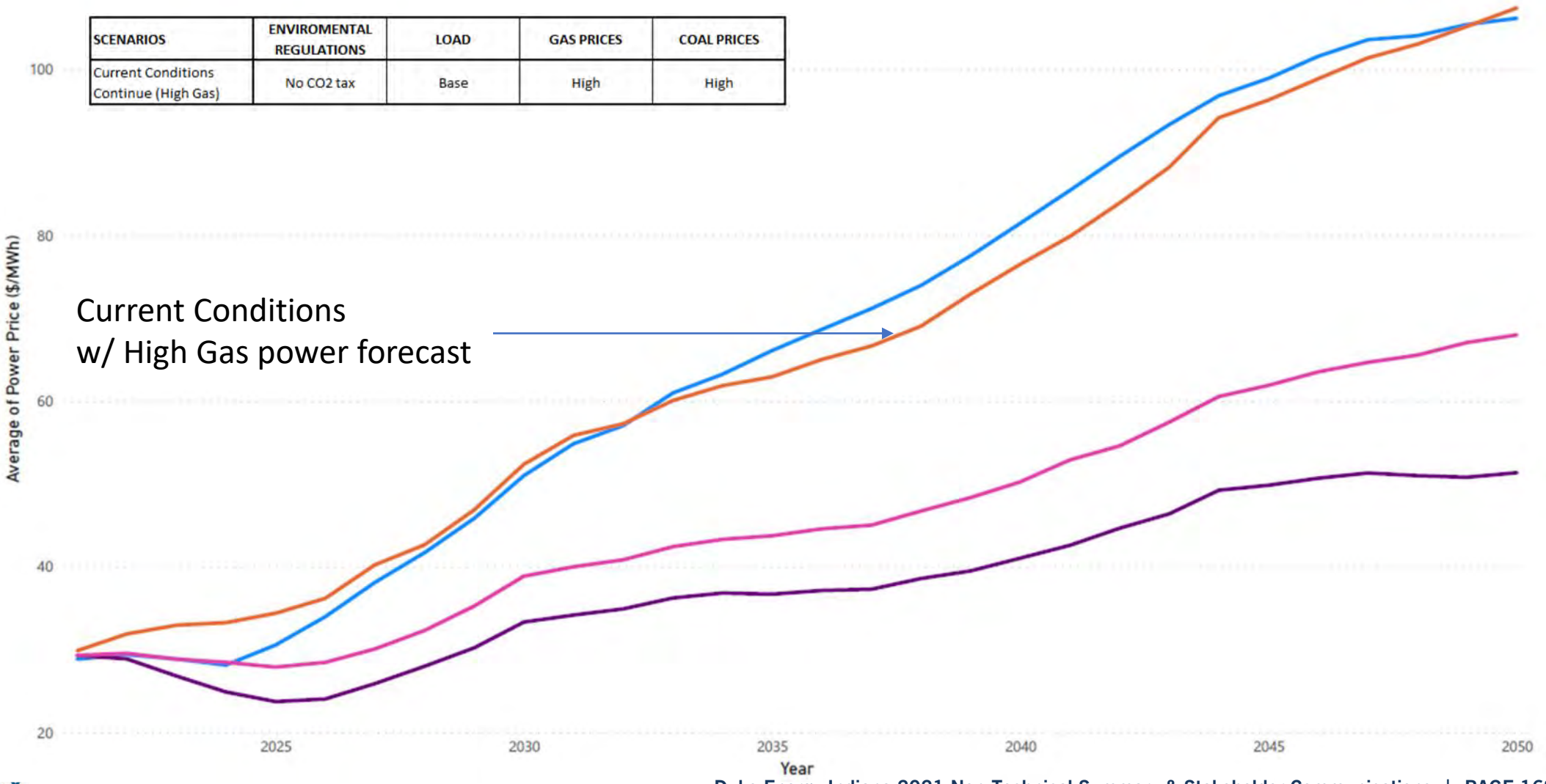


Current Conditions w/ High Gas (MISO Power Prices)

Scenario: Ref w/ CO2 Reg; Ref w/o CO2 Reg (Base Gas); Current Conditions (High Gas); Current Conditions (Low Gas)

SCENARIOS	ENVIROMENTAL REGULATIONS	LOAD	GAS PRICES	COAL PRICES
Current Conditions Continue (High Gas)	No CO2 tax	Base	High	High

Current Conditions
w/ High Gas power forecast



Deep Decarbonization/Rapid Electrification

EMCC Deep Decarbonization and Rapid Electrification Scenario Parameters

CO_2 Emissions	Unit	Source	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Total CO_2 Emissions	*MM metric tons*	n/a	20	20	19	18	16	15	13	12	11	9	8	7	6	6	5	5	4	4	3	3	3	3	2	2	2	2	2	1	1	1	1
Electrification Load Increase	**Unit**	**Source**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**
Light-Duty Vehicles	*TWh*	EV-REDI	0.0	0.0	0.0	0.1	0.1	0.2	0.4	0.7	1.0	1.4	1.8	2.2	2.5	2.9	3.3	3.6	3.9	4.2	4.5	4.7	4.9	5.1	5.2	5.4	5.5	5.7	5.8	5.9	6.0	6.0	6.1
Heavy-Duty Vehicles	*TWh*	EV-REDI	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.4	0.5	0.7	0.9	1.1	1.5	1.8	2.2	2.6	3.0	3.4	3.9	4.3	4.8	5.3	5.7	6.2	6.6	7.0	7.4	7.8	8.1	8.4
Residential Buildings	*TWh*	BDC	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.0	2.1	2.2	2.2	2.3	2.3	2.4	2.4
Commercial Buildings	*TWh*	BDC	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.6	0.6	0.7	0.8	0.8	0.9	0.9	1.0	1.0	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.3	1.3
Industry	*TWh*	Mid-Century Strategy/EIA	0.0	0.1	0.2	0.4	0.6	0.9	1.1	1.5	1.9	2.4	2.9	3.6	4.3	5.2	6.2	7.3	8.4	9.7	11.1	12.5	13.9	15.4	16.8	18.1	19.4	20.6	21.7	22.7	23.5	24.3	24.9
Total Load			**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**
Without Electrification	*TWh*	Placeholder assumption	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8
With Electrification	*TWh*	n/a	27.9	28.0	28.2	28.5	28.8	29.3	29.9	30.8	31.8	33.0	34.3	35.7	37.3	39.0	40.8	42.8	44.9	47.0	49.2	51.5	53.8	56.0	58.2	60.2	62.2	64.1	65.8	67.3	68.7	69.9	71.0
DER Adoption			**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**
Solar	*MW*	LBNL (2040 only)	0	28	62	103	151	207	272	347	433	530	637	756	883	1,018	1,159	1,302	1,446	1,586	1,721	1,849	1,967	2,075	2,172	2,257	2,333	2,398	2,454	2,502	2,542	2,576	2,604
Battery Storage	*MW*	LBNL (2040 only)	0	5	11	18	26	36	48	61	76	93	112	133	155	179	203	228	254	278	302	324	345	364	381	396	409	421	430	439	446	452	457

Biden Climate Plan Discussion

- Environmental Policy is a priority of the new administration
- Details on new regulation is still to be determined
- In keeping with the high level goals that are being discussed, this scenario will be modeled as a mass cap reduction that gets the utility's CO_2 emissions to zero by 2035
- The IRP will model the Biden Climate Plan to determine what it would take for DEI to meet zero CO_2 emissions and still serve customers load

Next Steps - Connecting Scenarios to Portfolios

1. For each scenario, an optimized portfolio will be developed
   - Minimizes cost for that particular scenario only
2. Take lessons learned from optimized portfolios to develop alternate portfolios
3. Specify any stakeholder portfolios
4. Evaluate all portfolios by testing them across the range of scenarios

ROAD MAP FOR IRP STAKEHOLDER PROCESS

Workshop 1 Nov. 20, 2030	Workshop 2 Jan. 21, 2021	Workshop 3 April 21, 2021	Workshop 4 June 21, 2021	Workshop 5 August 2021	Workshop 6 Sept. 2021	Workshop 7 Oct. 2021
✓ Goals of IRP ✓ Review of 2018 IRP ✓ Contemplated changes for 2021 ✓ Load Forecasting, including: • Energy efficiency (EE) • Electric vehicles (EVs) • Distributed Energy Renewables (DERs)	✓ Recap ✓ Follow-ups: • Climate change load forecast ✓ Scenario intro ✓ AMI data ✓ Customer Programs ✓ DERs	✓ Recap ✓ Follow-ups: • Climate change load forecast • Request for Information ✓ EE and demand response (DR) modeling ✓ Scenario update ✓ Portfolio creation tool	➢ Follow-ups: • Climate change load forecast • Portfolio tool ➢ Deep dive on scenario assumptions ➢ Connecting scenarios to portfolios	➢ Follow-ups ➢ EE Bundling/ DR deep dive ➢ Retirement analysis ➢ Scorecard ➢ Optimized portfolio results for each scenario ➢ Hybrid and Stakeholder portfolios initial discussions	➢ Follow-ups ➢ Modeling results on sensitivities ➢ Hybrid and Stakeholder portfolios modeling results	➢ Follow-ups ➢ Scorecard ➢ Preferred portfolio and short term action plan

Stakeholder scenarios due by July 23

Stakeholder portfolios due by August 31

Evening Q&A Sessions for Customers	
January 20, 2021	Late July 2021

Ongoing technical meetings and data provision

Closing Comments, Stakeholder Comments

Wrap Up

- Meeting survey to be sent out in the next week to attendees
- Comments can also be sent to:
  - Scott at: scott.park@duke-energy.com
  - Stewart at: stewart@vanry.com
- Meeting summary and other materials will be posted on website by June 30
  - https://www.duke-energy.com/home/products/in-2021-irp-stakeholder
- Next workshop expected to be in early Aug

Acronyms

AMI	Advanced Metering Infrastructure
CHP	Combined Heat & Power
CPP	Critical Peak Pricing
CS	Small Commercial
DR	Demand Response
DER	Distributed Energy Resource
DEI	Duke Energy Indiana
DSM	Demand Side Mgt (EE + DR)
EV	Electric Vehicles
EE	Energy Efficiency
EIA	Energy Information Administration
IURC	Indiana Utility Regulatory Commission
IRP	Integrated Resource Plan
LBNL	Lawrence Berkeley National Lab
LMI	Low-Medium Income
MW	Megawatt
NEM	Net Energy Metering
NDA	Non-disclosure agreement
PPA	Purchase Power Agreement
PVRR	Present Value of Revenue Requirements
RFI	Request for Information
RS	Residential Standard
RE	Residential Electric
TOU	Time of Use
TOUD	Time of Use with Demand
T&D	Transmission and Distribution
UCAP	Unforced Capacity
UPC	Usage per Customer
VPP	Variable Peak Pricing
VPPD	Variable Peak Pricing with Demand

DEI IRP
Notes of Meeting #4

Date: June 21, 2021
Time: 9:00AM – 4:00 PM
Location: Virtual Meeting/Webinar via Zoom Vanry Associates/DEI Host

Attachments:
1. Meeting Slide Presentation
2. Webinar Q&A log

Meeting Notes:

Welcomes: Stan Pinegar, Scott Park and Stewart Ramsay

- Welcome
- Safety Brief
- Review of Webinar tools and protocols
- Review Agenda
- Review Objectives for the day

Presentation and Discussion: Scott Park and facilitation by Stewart Ramsay

Please see the attached Meeting Slides. We have also attached the Webinar Q&A Report (Excel sheet) from the June 21 IRP Stakeholder Meeting #4. Together these constitute our summary of this meeting.

You will note that the Q&A Report reflects two types of responses. The first type is questions to which written responses were provided in the meeting. These questions and answers are verbatim transcripts produced by the webinar software. The second form is noted as "live answered" questions. In these questions, the answers may not be verbatim, and are our best summary of the answers that were provided live.

Additionally, several of the "live answered" questions we interpreted as being similar in scope. Therefore, in the meeting, we attempted to bundle these into a single reply. The Response column in the Excel sheet notes where and how this bundling was done.

Agenda items for IRP meeting #5:

- Modeling DSM & Renewables
- Scenarios
- Portfolio Sufficiency
- Portfolios
- Stakeholder Developed Portfolios
- Analytical Framework
- Draft Scorecard (21 CTF)

Question Details				
#	Question	Asker Name	Response Type	Response
1	TEST	CCL People with SuperAbilities	live answered	Thank you, yes it is working
2	The chat is turned off. Will you turn it on?	Laura Arnold	live answered	No, we will only be using the Q&A feature, please ask questions or comments with the Q&A box
3	Will everyone receive a copy of the Q&A?	Leslie Webb	live answered	Yes
4	Could you unmute folks who have asked a question if they need to follow up to clarify?	Anna Sommer	written	Indeed we will keep the unmute off
5	There is no participants box	Indra Frank	written	Indra - I think its by number only
6	Please ask Stan to smile.	Laura Arnold	live answered	Stan could you smile please? Thank you.
7	Anyone update on the plan for the Gibson plant?	CCL People with SuperAbilities	written	Beth sent you a note asking for clarification
8	Any update on the plan for the Gibson plant?	CCL People with SuperAbilities	written	Good morning - can you please clarify your question so we can better answer it? Are you seeking an update on retirement dates or otherwise?
9	Please briefly explain what "modeling at the MISO level" means.	Michael Mullett	written	Mike, I think that this will answered in the slides coming up. If not, then we will provide more detail
10	Does MISO have input into the MISO-level modeling used for DEI IRP purposes?	Michael Mullett	live answered	DEI uses models that include the model that all MISO members use and contribute to. DEI does not, nor do any other member utilities, engage MSIO directly in the development of IRPs. Everyone contributes data to the model so that planning across MISO is based on consistent assumptions.
11	sure	Michael Mullett	live answered	thanks
12	How do the temperatures and load change seasonally under the climate change scenario?	Anna Sommer	live answered	Answered with questions 15
13	This does not include increased load due to electrification of transportation and heating.	Susan Schechter	live answered	That is correct. We will discuss that a bit later in the discussion

14	Average annual temperature doesn't work like that. It pushes summer a lot. I don't think this is an accurate representation.	Leslie Webb	live answered	We are using the data from the Purdue climate model that shows us temperature and humidity for every hour of every day through 2050. We are using that weather data and converting it to load and energy based on historical relationships between temperature, humidity and load. so that gives us the load in every hour of every day for the entire period, including expected impacts on peak load
15	We have 60 degrees in the winter more then we think. About 1/3 of the season these days. That's more then two degrees. What are you doing to plan for that?	CCL People with SuperAbilities	live answered	answered with questions 15
16	2 degree increase in AVERAGE ANNUAL TEMP is significant	Leslie Webb	live answered	answered with questions 15
17	This chart looks at overall load. What would happen to peak demand?	Indra Frank	live answered	answered with questions 15
18	Are you ever going to retire the Gibson plant?	CCL People with SuperAbilities	written	The current plan is still from the Company's last IRP: Retire Unit 5 first in 2026 then the remaining units in the 2030s. Any update about retirement dates will be made after the portfolio analysis which is yet to come.
19	Is humidity a explanatory variable in your load forecast? If so, how does that change over time under this forecast?	Anna Sommer	live answered	answered with questions 15
20	My understanding is that projected summers will be hotter than what we experienced in 2012 if we keep dumping CO_2 into the atmosphere. Does your modeling take that into account?	Leslie Webb	live answered	We are relying on the Purdue Climate model to identify what the impacts of CO_2 will look like over the study period.

21	I don't think my question was answered live. This is the key concern for many stakeholders on the call, especially our young people.	Leslie Webb	written	It is my understanding that the Purdue Climate model takes into effect the impact of additional CO_2 based on what the Purdue Climate experts are forecasting. So DEI is relying on the Purdue expertise to look at the impacts of CO_2 on temperature and humidity. I hope that answers the question.
22	What will the CO_2 tax be in 2025 again? And then how often will it go up after that, how will that affect the consumer?	Mark Warner	live answered	$15 per ton and escalating at $5 per ton per year for the remainder of the study period
23	What is the difference between Reference and Current Conditions Continue?	Leslie Webb	live answered	Both Reference scenarios use the base gas forecast whereas the Current Conditions scenarios use either the high or low gas forecast
24	Is the cost of closing down fossil fuel plants included in the scenario costs	Ray Wilson - Indiana	live answered	The cost of decommissioning units is included in the unit costs. So the units are modeled and the dispatch of the units is based on their costs including what is collected for decommissioning.
25	$5/ton increasing by $5/year - is this through 2040? and also, to confirm, the CO_2 price is included in the dispatch cost?	Devi Glick	live answered	It is actually modeled that way through 2050 so we can see impacts that occur just after the study period. Yes the CO_2 price impact is included in the dispatch costs and effects the economic results for each unit.
26	In any of the scenarios w/o CO_2 regulation, does Duke model market forces such as investment/disinvestment in various fuel sources, industries and companies based on their CO_2 profiles, etc.	Michael Mullett	live answered	To some degree these are factored in based on how they impact the other projections of things like EV, and rooftop solar. DEI does not do any separate analysis regarding investment/divestment decisions. We rely on the projections of overall impacts from the other studies that we rely on like LBNL and B&M.
27	Are you accounting for solar and wind tax credits?	CCL People with SuperAbilities	written	Yes

28	What is the model optimization period? Does the model see the CO_2 price in 2040 when making a decision around building a new gas plant today or is it optimizing around a shorter time period?	Devi Glick	written	The period is to 2050, so yes the model sees the CO_2 price in future years.
29	Where did the carbon tax projection ($5 per ton with an increase every year) come from? I haven't heard of a proposal for this from members of Congress.	Indra Frank	live answered	This is Duke Energy's corporate assumption for carbon regulation and should be viewed as proxy for carbon regulation which is still undetermined.
30	There are currently 4 bills with carbon pricing in Congress, and the lowest starting price is $15/ton. There were 9 in the previous session of Congress, and the lowest starting price was also $15/ton. Similarly, an annual adjustment of $5/ton is lower than proposed legislation. Why are you assuming $5 with $5 annual increase?	Alex Jorck	live answered	When comparing Duke Energy's CO_2 tax forecast against other utilities, our forecast tends to start earlier and lower than the other forecasts, but increases more quickly. The thought for this was that the government would implement CO_2 regulation gradually in order to lessen the shock to the economy.
31	How are you accounting for solar and wind tax credits?	CCL People with SuperAbilities	written	The costs of solar and wind are reduced by the tax credit benefits in the modeling
32	Can you show Duke's carbon emissions for your different scenarios/portfolios?	Leslie Webb	written	The carbon emissions will be shown for the various portfolios when that analysis is done.
33	Scott you said that the model will go out to 2050, but DEI has previously said it will only go out to 2040, can clarify which it is?	Anna Sommer	live answered	We model out to 2050. The study period goes to 2040. We go out to 2050 in our analysis to allow us to see if anything that would happen shortly after the study period would cause us to make a different decision. Given the long life of some of the investment decisions, we think it is important to look past the study period to make sure we are making the logical recommendations.

34	why did you take tax credits off this slide since last meeting?	CCL People with SuperAbilities	written	I think it was just a simplification of the slides. We are still including tax credits in the modeling.
35	Carbon emissions are only part of the climate equation. Especially with gas plants in the mix. Will GHG emissions in total be modeled?	Susan Schechter	live answered	No- we have discussed this, but determining an unbiased method and how far up the supply chain to model GHG emission has not been succesful.
36	If you add a 30 year gas plant in 2030 and the scenario says fossil fuels need to be gone by 2050, are the last 10 years of depreciation reflected in the costs during the first 20 years?	Barry Kastner	live answered	Yes, we will evaluate shortened life assets in the modeling
37	why did you take tax credits off this slide since last meeting?	CCL People with SuperAbilities	live answered	answered with question 40
38	So you're viewing the period 2040 - 2050 as an end effects period, but everything will be reported in the IRP only through 2040?	Anna Sommer	live answered	Essentially that is correct. If there are things that occur in the 2040-2050 period that impact our decision making we would discuss those as well in the report.
39	why did you take tax credits off this slide since last meeting? Part two ... it just makes you look like your covering it up.	CCL People with SuperAbilities	live answered	All tax credits that are currently in force are included in the analysis. Production tax credits, for wind and solar as well as other tax credits for renewables are all in the analysis.
40	Externalization of climate costs is baked in to your cost modeling.	Susan Schechter	written	We do not include externalized costs, just those costs to the utility that required by regulations (or likely to be required in the time period)
41	I just want to note that this new format, with only the two of you talking to each other and no other voices in the space, is significantly less engaging. FWIW.	Wendy Bredhold	written	Wendy - participants can also raise their hand and ask questions live at the end of each section with back and forth. Feel free to use that functionality, as well.

42	What is the model optimization period? Does the model see the CO_2 price in 2040 or the zero by 2035 regulation when making a decision around building a new gas plant today or is the model optimizing around a shorter time period than the full 20 years?	Devi Glick	live answered	Yes, the model does see the forward constraint whether it be a CO_2 tax or a mass cap reduction
43	do you still get tax credits for non renewable energy?!	CCL People with SuperAbilities	live answered	Any existing tax credits are included in the model. I do not believe that there are any non-renewable tax credits remaining.
44	Because of the declining value of the renewable tax credits, developers often safe harbor the higher levels by spending 5% of project costs. I think it would make sense to assume safe harbored projects are available to Duke.	Anna Sommer	live answered	We will take a look at that to make sure that we are not missing anything in our assumptions.
45	Devi has an outstanding question.	Wendy Bredhold	written	I am about to bring that up thank you. I am keeping an eye on things and trying to get them answered in the space where they are most impactful. Thank you for the reminder.
46	Your carbon price starting point and escalation rate are both low in comparison to actual legislation as opposed to other utilities' assumed rates. I'd be happy to share details on such legislation if DEI would consider these prices for modeling purposes	Alex Jorck	written	It would be helpful for you to provide and we can consider whether we can use it for a sensitivity or scenario. I think we would need it by the July 23 timeframe that Scott mentioned. Thanks.

47	Do you mean Hydrogen from coal?	Leslie Webb	live answered	It could be from coal, though we were really anticipating that it would be from using low cost or excess electricity to crack water to get the hydrogen. It could also be from other streams like stripping it out of natural gas.
48	Scott just said that they are looking for the portfolio that works best across the most scenarios, this is exactly why we think using a Ref Case w/o CO_2 Reg, Current Conditions (Low Gas) and Current Conditions (High Gas) are so problematic. Those scenarios are all very favorable to new gas plants and are largely indistinguishable between each other. We think the high/low fuel prices should be sensitivities, not scenarios.	Anna Sommer	live answered	This question was held for discussion until later in the meeting and was answered live during the discussion of scenarios and sensitivities. The answer provided is included here: Stewart: "I may have been the culprit and may have confused the issue when I spoke earlier about how optimization of portfolios would be used. Scott can you please clarify how it will be done?" Natural gas prices are a key driver to resource selection and modeling a high and low gas scenario is critical. Whether it is labeled as a sensitivity or scenario is immaterial.
49	Are you considering some small project to store hydrogen from excess renewable production? Your decision to build Edwardsport shows your appetite for experimentation.	Susan Schechter	written	Nothing in the works for Indiana at this point. We are looking into various research and development and supporting it at the federal level.
50	Why is there a step change on the coal pricing in 2040?	Leslie Webb	live answered	We will have to go back to the originators of the study to be certain and it is probably the result of changes in the assumptions about the availability of coal given other economic factors.
51	No worries Stewart.	Anna Sommer	written	thanks. I was sure you would understand and just wanted the group to know that I was not ignoring you. Good question that I want Scott to discuss when we get a little further in. I think that it will be important for everyone's understanding.
52	Indicate level of externalized cost?	Susan Schechter	written	Hi Susan - Would you be able to ask that question more specifically?

53	The B&M and Guidehouse prices are generally higher than AEO for renewables and lower for thermal resources. Have you compared these forecasts to other price forecasts such as those from the NREL Advanced Technology Baseline? Have you considered adding a scenario with less conservative renewable cost assumptions, instead of including three current conditions/no CO_2 price cases?	Jason Frost	live answered	We will look at runs where renewable costs are lower.
54	The battery FOM exceeds the expected all-in cost of the batteries themselves, so that seems quite high. The solar and storage cost is higher than Duke got in its RFI response.	Anna Sommer	live answered	We will look into this and follow up in the next meeting.
55	It would be helpful to include externalized costs in cost of new generation.	Susan Schechter	written	what types of costs are you referring to? I just want to make sure that we get the right answer for you.

56	You may have to replace cells yes but you don't have to replace the whole battery facility. The resource costs are crucial to the portfolio selection so I would second Jason's suggestion to make less conservative renewable costs another scenario to replace at least one of the non CO_2 price cases. The drop in renewable and battery pricing has fundamentally remade resource acquisition so I think that's really important to capture in a scenario and not just relegate it to a sensitivity.	Anna Sommer	none	We will look into this and follow up in the next meeting.
57	I think this is a larger scope than Duke's IRP.If you have the capability for doing a resource planning for MISO footprint, why don't you show same looking at just Duke?	Leslie Webb	written	We will - that will be in the portfolio modeling results that come in future meetings.

58	It looks like you are planning to model changes in external variables on MISO-wide resource decisions, but to what extent are you planning to model changes in MISO rules and decision-making in response to those resource decisions? ELCC-related and seasonal construct effects of solar resources are examples that it sounds like you may be planning to model, but there may be other effects that arise from the topics studied under MISO's RIIA study. Another possible topic: will there need to be changes to MISO market designs in response to increasing levels of zero-marginal-cost resources that may affect market prices and thus the relative attractiveness of resources? And to what extent could (possible) greatly increased transmission investment in MISO (and elsewhere) change the ability for DEI to draw on further-afield diverse resources (and perhaps decrease its need to build resources within its footprint)?	Peter Boerger	live answered	Modeling differnent MISO rules is difficult as it requires the forecasting of a number of key details that are just unknown. For this IRP, we will be looking at evaluating the impact of seasonal planning which would include a switch to winter planning with a corresponding change in the contribution to peak of various resources.

59	The modeling doesn't appear to include much growth in renewable capacity between now and 2030, while EIA data shows more than 2,200 MW of solar and wind currently under construction in MISO and coming online just in the remainder of 2021. Will you be comparing these results for the 2020s to recent trends and already planned additions? This difference could suggest that the modeled renewable cost assumptions are higher than the costs that actual developers are seeing.	Jason Frost	live answered	I think that may be a function of how the charts are scaled. The actual renewable levels are increasing significantly, if you examine both charts closely you can see that the scales are different and it makes it appear that the renewables growth is smaller. When you account for the scale difference, you see that the renewables growth is significant. Anything that is in production in MISO or is ready to come on line is included in the analysis. We also need to remember that there is a difference between the nameplate capacity and the amount of capacity that is credited within MISO, and the energy contribution of these resources, taking into consideration that the wind does not always blow when we need it and the sun isn't always shining when we would like the solar capacity.
60	Vanry Associates asked its questions on the assumption that MISO would be economically dispatching the DEI (and other available) units, but this does not take into account DEI's (and other vertically integrated utilities) ability to "self-schedule" their own units. How is "self-scheduling" factored into the dispatch paradigm being modeled in the IRP?	Michael Mullett	live answered	MISO schedules and dispatched all units in the market. DEI and the other MISO members do not self dispatch. Dispatch decisions are made at MISO considering the economics of the entire MISO grid.
61	Good morning! How does the coal capacity projection in the MISO reference case compared to DEI's current plans for coal plants? i.e. The MISO reference case with a CO_2 tax shows coal is phased out in the early 2040s for all of MISO, but what is the projected coal phase out date for coal for DEI?	Simon Lomax	written	In the current IRP, all DEI coal retires by 2038 with the exception of Edwardsport (which is currently 2045). Of course, all that could be updated in this new IRP.

62	Sorry, I do not have a microphone at this time. I think you did a good job of relating the gist of my question, and I will think about Scott's answers. So I think I am good for now.	Peter Boerger	written	Ok great! We thought you had a great question that might need elaboration
63	How does your model handle the practice of self-scheduling?	Leslie Webb	live answered	answered with question 61
64	In the modeling of MISO capacity and energy mix, are retirements economically determined or based on economic analysis or on plant age?	Douglas Jester	live answered	The MISO capacity and energy mix are based primarily on economics, though there are some units that have a minimal dispatch level, which ultimately is driven by economics associated with costs or stopping and starting.
65	Can you provide the annual CO_2 emissions for these MISO wide portfolios? That would be really helpful in understanding whether the CO_2 regulation has a meaningful impact.	Anna Sommer	live answered	That would be very interesting analysis. I believe that we can do that, or a close approximation. We will look to include that analysis going forward.
66	It almost looks like DG capacity with CO_2 tax is less than without CO_2 tax. Can you please speak to this comparison?	David Gard	live answered	Again, this looks to me to be an issue of the scale on the charts.
67	As queried earlier, Scott's slides clearly show that no "feedback loop" between CO_2 emissions and generation mix is being modeled in the absence of a CO_2 tax. THIS IS NOT THE WAY THE REAL WORLD IS CURRENTLY BEHAVING!!!	Michael Mullett	live answered	This is true; the CO_2 tax as a proxy for carbon regulation is the mechanism that provides that feedback loop. The climate change load forecast speaks to this issue as well. The DDRE scenario will also speak to this issue as well.
68	why did the total MW in 2050 go so much higher in the low gas scenario?	Indra Frank	live answered	(Assuming question was asking about MWh rather than MW) With the low cost of gas, combined cycles take advantage of low gas prices and run more based on economics

69	For your customers concerned about CO_2 emissions for the different scenarios, could you show the variation in total CO_2 emission (projection) vs. time, for each scenario.	Jeff Haverly Heartland ECA	written	I believe that Scott said DEI would provide CO_2 impacts for each of the scenarios
70	Does the trope, when the sun does not shine and wind does not blow, expose an assumption that renewables are not an acceptable to DEI source of electricity? The graphs show that to be an underlying assumption.	Susan Schechter	written	No. Scott was explaining how the system operators MISO and others like them, treat different types of capacity based on if they are dispatchable and can produce output on demand or only produce energy when they can regardless of when or how much is needed.
71	It looks like MISO price forecasts do not vary very much between scenarios. Is that that the case? If so, what is going on there?	Peter Boerger	live answered	The forecast for each of the scenarios is shown on each of the charts. So all four lines are the same from chart to chart. We did this for ease of comparison of the forecasts between the different scenarios. Each of the forecast lines is labeled so that you can track which scenario is reflect by each line in the chart.
72	Is electrification included in any of Duke's scenarios? Not including Mike's DD-RE scenario?	Leslie Webb	written	Yes. The DEI base load forecast includes assumptions around EVs.
73	Yes-=-the power prices	Peter Boerger	live answered	yes the assumptions about EVs are reflected in the power prices in each of the scenarios
74	I am asking about the prices comparing the different slides re: miso prices.	Peter Boerger	live answered	answered with question 73

75	I have a couple of questions related to the use of the Horizons database to develop the MISO power price forecasts. Since the Horizons database contains more generic operating information for the existing generating units in MISO, did Duke update the information in the Horizons database for its own units? Also, did Duke keep the assumptions within the Horizons database around annual retirement limits in MISO, in addition to the new thermal and renewable resource cost assumptions? Or did Duke model the price information from Burns and McDonnell?	Chelsea Hotaling	live answered	Yes, we updated certain values for some of our units (I can provide a list of changes if needed). However, we did NOT increase the detail or complexity of any resource models (maybe making new nuclear resources SMRs might be an exception to this). Typically we have found that adding detail adds cost. This leads to giving less detailed resources an unfair advantage. For NCL runs we kept the Horizon retirement assumptions the same. For CO_2 runs we extended nuclear units to 80 year lifespans. Additionally, for CO_2 runs we reduced the lifespans of CC units from 60 years to 50 years. We got the capital cost information for resources mostly from Burns and McDonnell with EPRI & NuScale for SMR, and Guidehouse for solar, off shore wind and batteries.
76	Your profile tool chart didn't add up on the excel sheet.	CCL People with SuperAbilities	written	Are you referring to the portfolio tool? If so, perhaps we can take that offline and Scott can contact you about it. The agency names shows, up but not your name.
77	Does the MISO data cover the entire MISO footprint? Seems to me that a resource planning model the covers 15 states would have a low confidence level. What is the value of the MISO data? Though interesting, it doesn't seem to be directly relevant to the discussion around DUKE's IRP.	Leslie Webb	written	Because we are part of the MISO power market, we are using the market wide approach to get the power prices to use in each scenario. Then we take those power prices our of this modeling and will model the DEI portfolio using the various MISO power price outputs. EPRI & NuScale for SMR, Guidehouse for solar, wind and batteries
78	where did the numbers in this table come from?	Indra Frank	live answered	stakeholder provided

79	Please characterize the levels of EV and heat pump penetration behind this scenario.	Douglas Jester	live answered	stakeholder provided but is much higher than base load forecast
80	What is the basis for electrification load increase predictions?	Lauren Aguilar	live answered	stakeholder provided data
81	What were base assumptions for light duty vehicles, for example?	Jeff Haverly	live answered	stakeholder provided data
82	Do they consider current proposed legislation, EVs - California, for example?	Jeff Haverly	live answered	Probably not. I mean to some degree they might, given that some of the forecasts are coming from LBNL and they are looking at what might drive changes. We have not done any work outside of these studies to try and add impacts of potential legislation. Any of that would be embedded in the studies that we are using, which are pretty well informed.
83	Explain without electrification and with electrification	Ray Wilson - Indiana	live answered	This would be the load without the rapid electrification and with the rapid electrification. We included both figures so that you could see the differences in the impacts between the assumptions.
84	Hi Jason! At the last IRP workshop, I think you said the 2050 load forecast with EVs was about 50% higher than the baseline. I think the table reflects that, i.e. 14.3 TWh for light duty and heavy vehicles to be added to 27.8 TWh, but just wanted to confirm.	Simon Lomax	live answered	Yes. That is correct.
85	BRAVO EMCC! Thanks for showing leadership that protects the future for our kids and grandkids.	Leslie Webb	none	
86	So deep decarbonization shows a tripling of energy sales in your table. What does it do to peak load?	Peter Boerger	live answered	That is also shown in the tables. Both energy and load.
87	Carbon zero by 2050?	Jeff Haverly	live answered	yes

88	why is the projected total load the same in 2020 and 2050 for a future without electrification?	Indra Frank	live answered	These are placeholder figures. Once we have the baseline identified we will add that into the table and then the rapid electrification totals will be added on top of that.
89	yes the portfolio tool. My name is Will Shields	CCL People with SuperAbilities	written	Thanks, Will. I'll have Scott contact you about the portfolio tool.
90	Why does Total Load, Without Electrification stay flat through 2050?	Dave Ciarlone	live answered	answered with question 90
91	Describe the solar line please	Ray Wilson - Indiana	live answered	stakeholder provided data
92	So would the solar be owned by Duke or others?	Ray Wilson - Indiana	live answered	Yes. The IRP analysis is indifferent to who owns the units. We may price units based on what we see in the market or what we believe it would take to build them. Once it comes to actually putting the units in place it would be based on the most cost effective solution for customers and that would drive who owns the units.
93	So 1 could assume that the solar generation (MW) would need to be built per that line?	Jeff Haverly	live answered	answered with question 90
94	What is basis for Battery storage amount per Solar? Are the assumptions based on such factors as demand over night vs. day, and cloudy days vs. sunny?	Jeff Haverly	live answered	stakeholder provided data
95	So the net demand needed to be met by a portfolio will include that much DER?	Dale Thomas	live answered	Yes that is correct
96	Are you taking into consideration a higher level of grid defection with the elimination of net metering and the rise of cost effective DG energy storage with solar DG?	Laura Arnold	live answered	If that is included in the LBNL and other studies then yes, otherwise we are not doing separate analysis on grid defection.

97	So DEI doesn't know from these numbers, if demand could be met?	Jeff Haverly	live answered	Our analysis would be done based on DEI having to meet this demand through the range of available resources.
98	Thank you.	Jeff Haverly	none	
99	Does the LBNL analysis underlying the Solar and Storage numbers (and other generation numbers perhaps not reflected in this table) support 'one day in 10 years' reliability?	Peter Boerger	live answered	Not directly. The LBNL analysis and other studies like it have data that we can use in the 1 in 10 type analysis, but that analysis really needs to be done in the context of the larger grid, in our case MISO. So we will be using all of these inputs and assumptions and doing reliability analysis and adjusting the results to ensure that whatever portfolios we land on meet the various reliability requirements.
100	Is the LBNL report in the public domain?	Jeff Haverly	live answered	Yes it is
101	Can we get a link?	Jeff Haverly	live answered	The link was provided by multiple audience members in questions 120, 121 and 122
102	Posted on IURC website	Dale Thomas	none	
103	Can you provide some examples of the biggest industrial sources that would be switching to electricity from another fuel source? Just trying to get my head around that 24.9TWh increase...	Simon Lomax	live answered	There are various manufacturing companies that might switch fuels for some or all of their processing. I don't have explicit examples at the moment but can look at that.
104	Thanks again	Jeff Haverly	none	
105	What assumptions are being made around demand response related to the additional end use electrification? I would assume a % of the space/water heat, industrial process equipment, etc. would enable additional DR capability.	Brian	live answered	We have only assumed that the existing DR will remain. We have not made assumptions about how much of the incremental load additions would be open or available to demand response programs. That is something that we might be able to look at down the road as a refinement.

106	In the news over the weekend there was a report that, despite no real government action to drive GHG lower, there has been such organic change (businesses acting on their own) to achieve GHG reductions that are below what would have been required by prior regulations/laws that were proposed but not enacted.	Dave Ciarlone	live answered	Answered with question 109
107	Did I understand that news correctly, and if so, how is that being modeled or integrated into the plan we are building?	Dave Ciarlone	live answered	I believe that it is being taken into consideration in certain of the models like the LBNL analysis and Purdue modeling. We are not making an DEI specific assumptions about how that might impact or reduce our assumptions.
108	Are you going to be 100% renewable by 2030?	CCL People with SuperAbilities	written	This IRP process will result in a preferred portfolio which will include a certain amount of renewables. It's not clear now that we could be 100% renewable by 2030 and still reliably meet customer's load. But, going through this process and looking at different scenarios will provide us valuable information about how quickly we can move to more renewables.
109	Scott, we suggested a somewhat less ambitious target for this scenario, not because we don't need to get to zero but because doing so will likely involve technologies we aren't yet characterizing in IRP modeling. So requiring zero emissions will probably give you an unrealistically expensive result.	Anna Sommer	live answered	That is a very interesting point. I am glad you brought that up. I think that you are right and we should look at some levels that are approaching 100% maybe like 90% and 95%. If we could get to 95% for significantly lower cost than getting to 100% that might change the recommendations. We will look at how to incorporate that in our analysis. Thank you Anna.

110	Using the assumption that DEI will completely serve your own load loses the quite large benefits of geographical diversity in renewable generation. The wind is almost always blowing somewhere, and solar benefits from east-west diversification as well as it generally not being cloudy everywhere.	Douglas Jester	live answered	We are not assuming that DEI will serve our own load through our own resources. The analysis we are doing is taking advantage of that diversity that we get from being in MISO. It also understand that at times in the future there may be constraints on the transmission of renewables from other parts of MISO or from outside of MISO. The costs associated with the constraints are factored in and the model will look for the best fit, lowest cost available resources regardless of where they are or who owns them.
111	Please confirm that your Biden scenario assumes no load growth from electrification in transportation, buildings, industrial processes or DERs.	Barry Kastner	written	The Biden scenario will include the DEI base load forecast which does include EV and DER assumptions.
112	As a customer, unaccustomed to IRP process, the indifference of the IRP process to the catastrophic human results of the business as usual scenarios modeled is truly horrifying. Does the contribution of DEI activities on human suffering factor into portfolio choice?	Susan Schechter	written	The IRP process (which is economic) may not be the best place to address human suffering, which does not have a price. The impacts of climate change you mention, including the risk and impacts of it on customers, will be considered outside of economic modeling.
113	Duke is the largest single source of carbon emissions in Indiana. We're all counting on you to protect the future for our young people!!!	Leslie Webb	written	We understand, Leslie. Thank you for your input. We will analyze a variety of portfolios and will balance reliability, affordability and clean energy in our decision-making.
114	Also, we want to get to carbon free by retiring coals plants earlier rather than through purchasing offsetting credits. Or maybe both.	Cheryl gettelfinger	written	Thanks, Cheryl. We understand the urgency requested and our analysis will demonstrate various portfolios of resources, some of those with more renewables earlier, and some with more moderate transition timelines. In the end we will need to balance affordability, reliability and clean energy.

115	Within all of these scenarios, will DEI assume that all of the stranded costs of the coal plants will be recovered in total by the retirement date? Or will DEI model using securitization to recover the stranded costs, especially with any 100% renewable scenario or the Biden climate plan?	Kerwin Olson	live answered	The IRP will model existing regulation. Other regulatory issues are outside the scope of the IRP process
116	Isn't there an interaction between gas price and resources elsewhere in MISO or beyond?	Dave Ciarlone	written	Yes. That is the point that Scott just made that even if DEI didn't have gas resources, the impact of gas prices changes things in MISO which has an impact on prices for DEI
117	With respect to Edwardsport, does Duke consider operation of the plant on natural gas a separate portfolio, or a sensitivity to the optimized portfolio?	Aaron Schmoll	written	We will be modeling Export on coal and on natural gas only. The optimized portfolio's will choose the operation of the plant.
118	Could you please send me the LBNL report referenced. I am looking in IURC, and it will take me some time, Thank you if you can.	Jeff Haverly	live answered	Jeff - did you get your answer from Kerwin and Dale pinned in the top of the questions?
119	This is for Jeff: https://www.in.gov/iurc/files/2020-Report-to-the-21st-Century-Energy-Policy-Development-Task-Force.updated-min.pdf	Kerwin Olson	none	
120	21st Century Report https://www.in.gov/iurc/files/2020-Report-to-the-21st-Century-Energy-Policy-Development-Task-Force.updated-min.pdf	Dale Thomas	none	

121	I think the question Kerwin raised about securitization deserves more thought. Securitization would seem to reduce the capital cost of the 'retire early' option compared to the 'continue to run' option, which would appear to reduce the incremental capital cost of replacement capacity. Whether or not securitization would be chosen and/or required would seem important.	Peter Boerger	live answered	See response to question 116
122	Which one of these scenarios covers Duke's own corporate sustainability goals?	Leslie Webb	live answered	Scenarios are external factors outside the company's control and as such would not necessarily include the company's sutainability goals. Portfolios on the other hand will be developed that are consistent with company goals.
123	Thank you Peter.	Kerwin Olson	none	
124	Financing of these resources matters related to the costs to both customers and the utility. PPAs vs. BTAs. Accelerated depreciation vs. Securitization. So on and so forth. PVRR alone does not capture the true costs of these plans.	Kerwin Olson	written	Understand the point you both are making and we will clarify by the next meeting.
125	yes, thanks to all...all 338 pages.	Jeff Haverly	none	
126	Are Duke's sustainability goals published?	Susan Schechter	written	Yes. Take a look at this resources on this website: https://www.duke-energy.com/Our-Company/Sustainability

127	Within the context of Leslie's question and Scott's Answer, I have heard "through the grapevine" that the "word" Duke is putting out is that stakeholders should not be disappointed with the Company's 2021 IRP because its major moves toward sustainable energy transition will not be reflected until its 2024 IRP. Is this "word on the street" accurate? If so, what is the explanation for the additional three-year delay in the Company move toward a sustainable energy transition.	Michael Mullett	live answered	Scott: I have not heard that rumor, but that is not a point of view we have. Stan: I may have been the source of that rumor in that I said that we expect the 2021 IRP to make meaningful progress in decarbonizing and diversifying the fleet in a way that makes sense for customers. But, with each IRP iteration every three years we expect to learn more and make further progress on the clean energy transition.







2021 Integrated Resource Plan

Stakeholder Workshop #. a

August 4, 2021

DUKE ENERGY

Agenda

9:30	Welcome, Protocols & Timeline
9:40	Follow ups from 4th meeting
9:50	Modeling DSM
10:30	Presentation from MISO
11:15	Wrap Up

ROAD MAP FOR IRP STAKEHOLDER PROCESS

Workshop 1 Nov. 20, 2020	Workshop 2 Jan. 21, 2021	Workshop 3 April 21, 2021	Workshop 4 June 21, 2021	Workshop 5a August 4, 2021	Workshop 5b Late August 2021	Workshop 6 Late Sept. 2021	Workshop 7 Mid-Oct. 2021
✓ Goals of IRP ✓ Review of 2018 IRP ✓ Contemplated changes for 2021 ✓ Load Forecasting, including: • Energy efficiency (EE) • Electric vehicles (EVs) • Distributed Energy Renewables (DERs)	✓ Recap ✓ Follow-ups: • Climate change load forecast ✓ Scenario intro ✓ AMI data ✓ Customer Programs ✓ DERs	✓ Recap ✓ Follow-ups: • Climate change load forecast • Request for Information ✓ EE and demand response (DR) modeling ✓ Scenario update ✓ Portfolio creation tool	➢ Follow-ups: • Climate change load forecast • Portfolio tool ➢ Deep dive on scenario assumptions ➢ Connecting scenarios to portfolios	➢ Follow-ups ➢ EE Bundling/ DR deep dive discussions ➢ MISO presentation	➢ Retirement analysis ➢ Scorecard ➢ Optimized portfolio results for each scenario ➢ Hybrid and Stakeholder portfolios initial	➢ Follow-ups ➢ Modeling results on sensitivities ➢ Hybrid and Stakeholder portfolios modeling results	➢ Follow-ups ➢ Scorecard ➢ Preferred portfolio and short-term action plan

Stakeholder scenarios due by July 23

Stakeholder portfolios due by September 7

Evening Q&A Sessions for Customers

January 20, 2021 | Late July 2021

Ongoing technical meetings and data provision

Follow ups from 4th IRP Stakeholder Meeting

- Q&A log
- MISO CO_2
- Horizon database
- Biden 95%
- Ownership assumption on cost

Modeling DSM

2021 Market Potential Study (MPS)

Duke Energy Indiana (DEI) retained Nexant to estimate the potential of demand-side management (DSM) programs in the DEI service territory including both energy efficiency (EE) and demand response (DR) programs.

- Extensive Indiana Oversight Board (OSB) engagement and feedback throughout the study
- Final draft report presented to Oversight Board on March 24, 2021

The MPS estimates levels of EE savings potential under varying sets of assumptions:

- **Technical** - Maximum savings possible, regardless of cost. Assumes 100% customer adoption
- **Economic** - All cost-effective measures with 100% customer adoption
- **Achievable** - Potential of cost-effective measures based on customer adoption assumptions in line with historical behavior for base case.
  - Additional scenarios provide adoption assumption changes based on program adjustments (incentives or marketing) as well as additional measure options identified by stakeholders.

2021 MPS – Achievable Potential Scenarios

Achievable program potential was estimated for five scenarios:

- **Base scenario with all customers** – includes all DEI customers and includes existing EE programs and measures currently offered.
- **Base scenario excluding opt-outs** – aligns with existing EE program portfolio excluding opt-out customers.
- **Enhanced scenario with expanded measures** – includes existing EE programs and measures and newly proposed measures, as well as new EE programs where measures did not logically fit into an existing offering.
- **Enhanced scenario with increased spending** – aligns with enhanced scenario with expanded measures but increases program spending via increasing incentives to drive higher program participation.
- **Avoided cost sensitivity** – aligns with enhanced scenario with expanded measures with increased potential that would occur if avoided energy costs were higher than current values. Measures are re-screened from UCT perspective with 50% increase in avoided energy costs.

2021 MPS – EE Potential Summary

Cumulative EE Potential (2021-2045)				
	Energy – GWh	% of 2045 Base Sales	Demand – MW (Summer)	Demand – MW (Winter)
Technical	9,318	32%	1362	1308
Economic	7,040	24%	1020	1000

Scenario	Energy – GWh	Avg. Annual % Base Sales	MW (Summer)	MW (Winter)
Base – Opt Outs	1082	.98%	182	153
Enhanced – Exp. Measures	1326	1.09%	212	188
Enhanced – Inc. Spending	1481	1.17%	220	218
Enhanced – Avoided Cost	1399	1.13%	214	206

2021 MPS – 5 Year Achievable Potential

5 Year Cumulative Achievable EE Potential (2025)				
Scenario	Energy – GWh	Avg. Annual % Base Sales	MW (Summer)	MW (Winter)
Base – Opt Outs	696	1.31%	112	101
Enhanced – Exp. Measures	741	1.36%	118	107
Enhanced – Inc. Spending	784	1.42%	121	114
Enhanced – Avoided Cost	815	1.46%	1226	116

- Additional data provided in the MPS includes:
  - Estimated program costs to acquire all the achievable potential for different scenarios
  - Estimated Cost Effectiveness Scores
  - Demand Response Potential

DUKE ENERGY

EE modeling in the 2021 IRP

In order to model utility sponsored EE as a selectable resource, this portion of EE must be removed from the load forecast and “bundled” for economic selection by the resource planning model:

- EE bundles are developed from measure data from the current portfolio filing and MPS
- The hourly energy and cost of each bundle is entered into the resource planning model like any other non-dispatchable supply-side resource
- The model compares among all possible resource options and calculates the lowest cost to serve customer load under the assumptions and inputs defined in each IRP scenario
- The optimized portfolio for each scenario is likely to select differing levels of Energy Efficiency
- Although the model evaluates each EE bundle as a discrete resource, actual administration of EE programs would make starting and stopping programs impractical solely based on model selections.

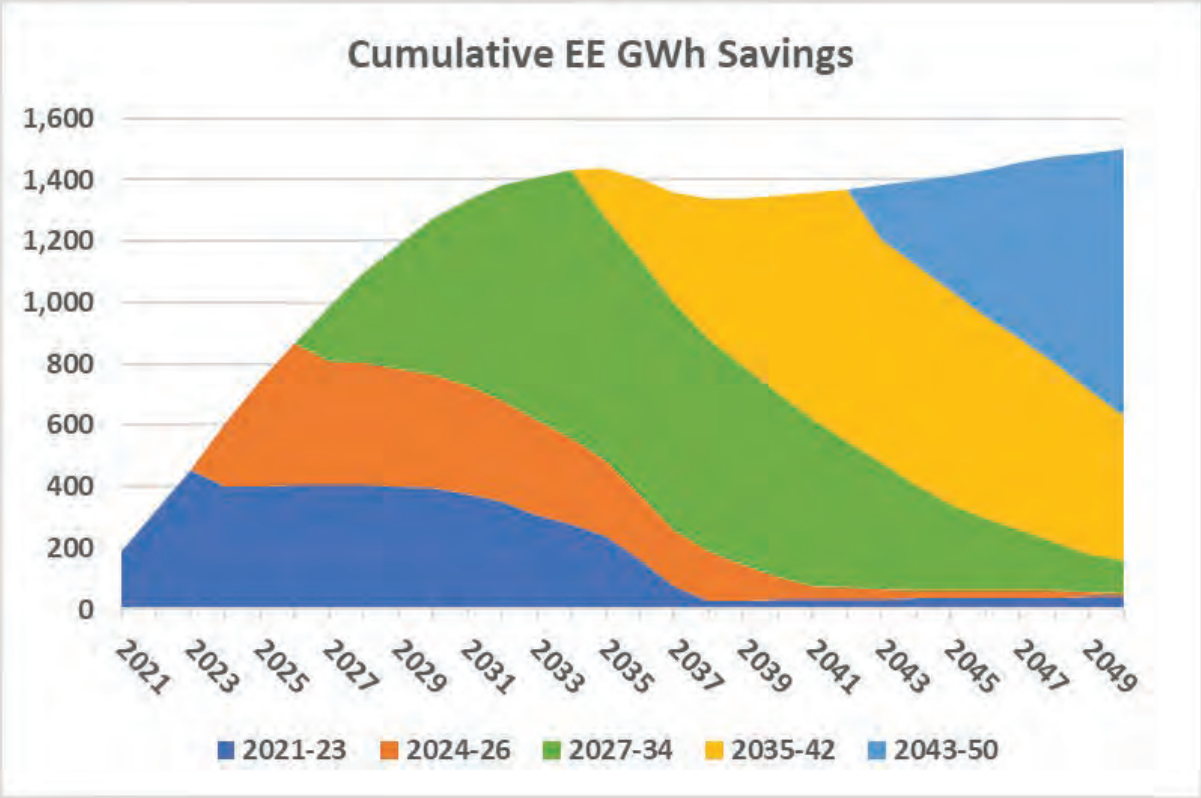
EE Bundle Design – 2021 IRP

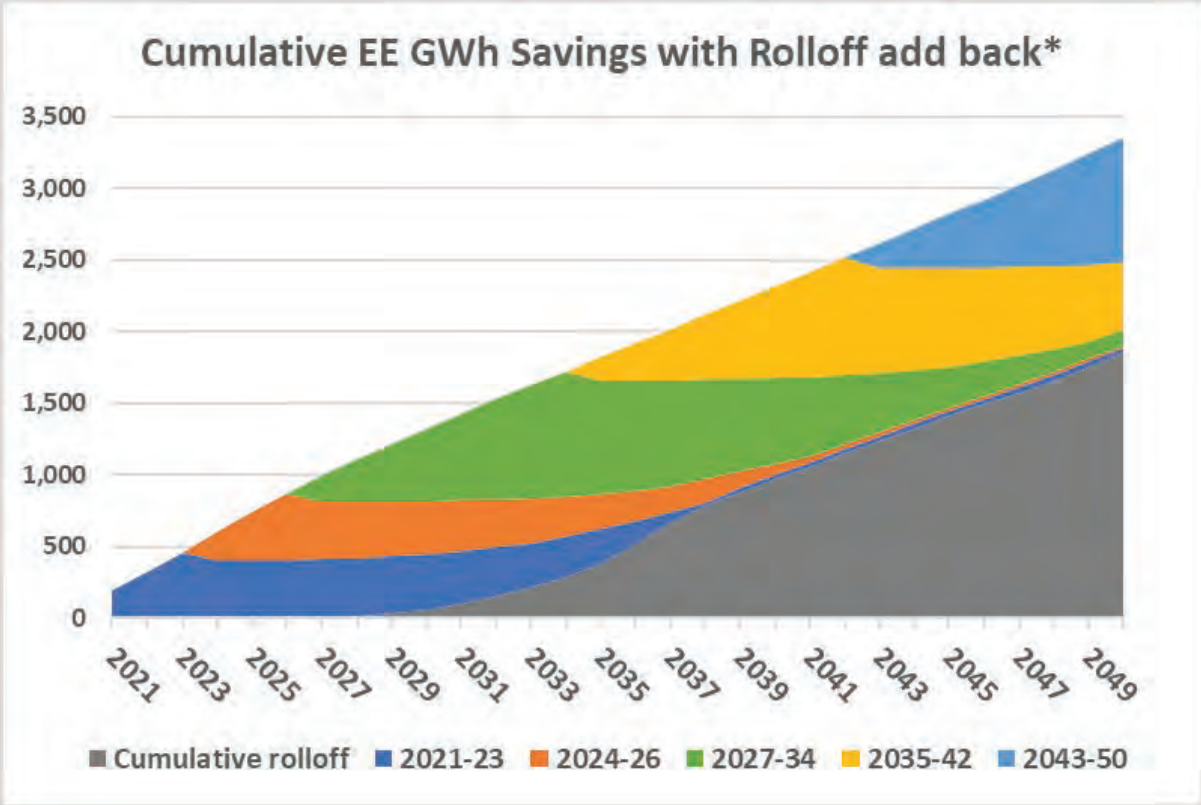
- Bundles developed from two of the five 2021 Market Potential Study (MPS) scenarios:
  - Enhanced Scenario with Expanded Measures
  - Avoided Cost Sensitivity

Bundle Structure for each Achievable Potential Scenario		
Time Period	Years	Measures Included
2021-2023	3	Current DEI portfolio filing (2021-2023) plus all MPS low-income measures (2024-2050)
2024-2026	3	All Residential and Non-Residential MPS measures except low income
2027-2034	8	
2035-2042	8	
2043-2050	8	

- Bundle levelized cost per MWh calculated using costs and energy savings impact for the full life of each measure.
- MPS provides kWh and costs through 2045 - extrapolated each measure to 2050 based on 2041-45.

Cumulative EE Bundle Savings (Expanded Measures)





* "Rolloff" of EE measure impacts is accounted for in load forecast

Demand Response

Resource Description

- Dispatchable resource where the company pays customers an option payment for the right to curtail specific customer loads during periods of high energy demand

Advantages

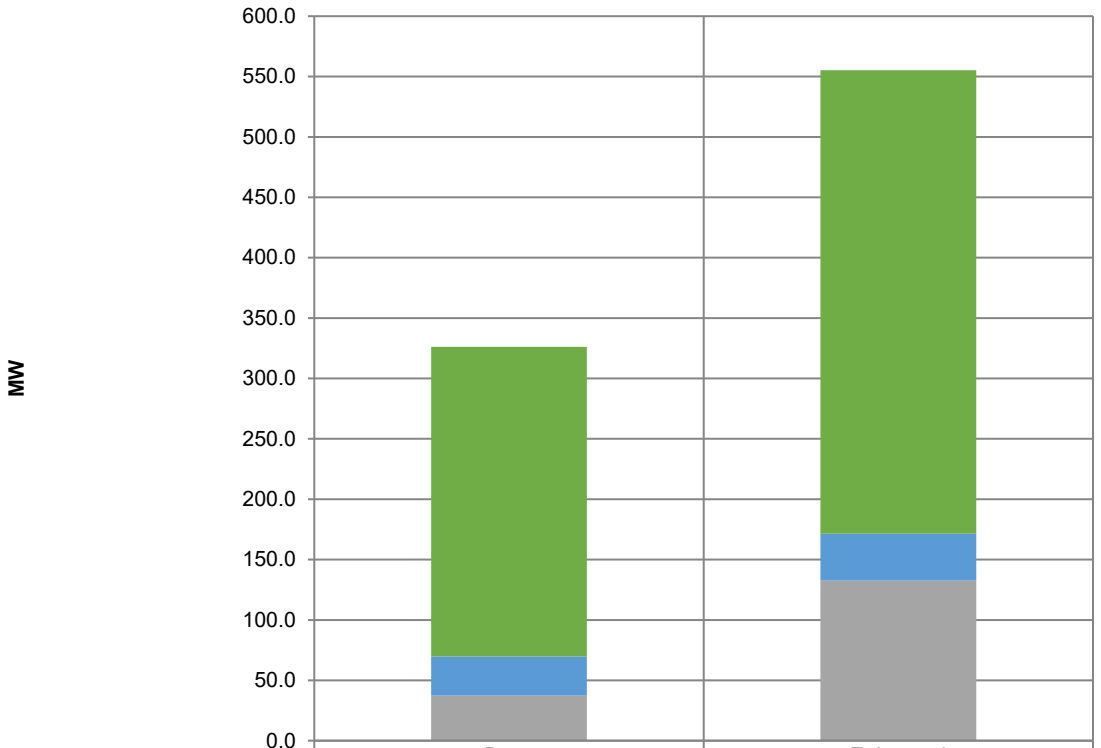
- Opportunity for customers to lower bill in exchange for interruption of select loads
- Useful during periods of high system load, enables operators to mitigate potential outages (rolling blackouts during emergency conditions) and reduce need for peaking capacity.

Disadvantages

- Excessive use of DR can lead to customers leaving program
- Enrolling incremental DR capacity can be increasingly expensive
    - Higher payments are often needed to incentivize new participant enrollment. This increase impacts overall program spend as it applies to both new and existing program participants.

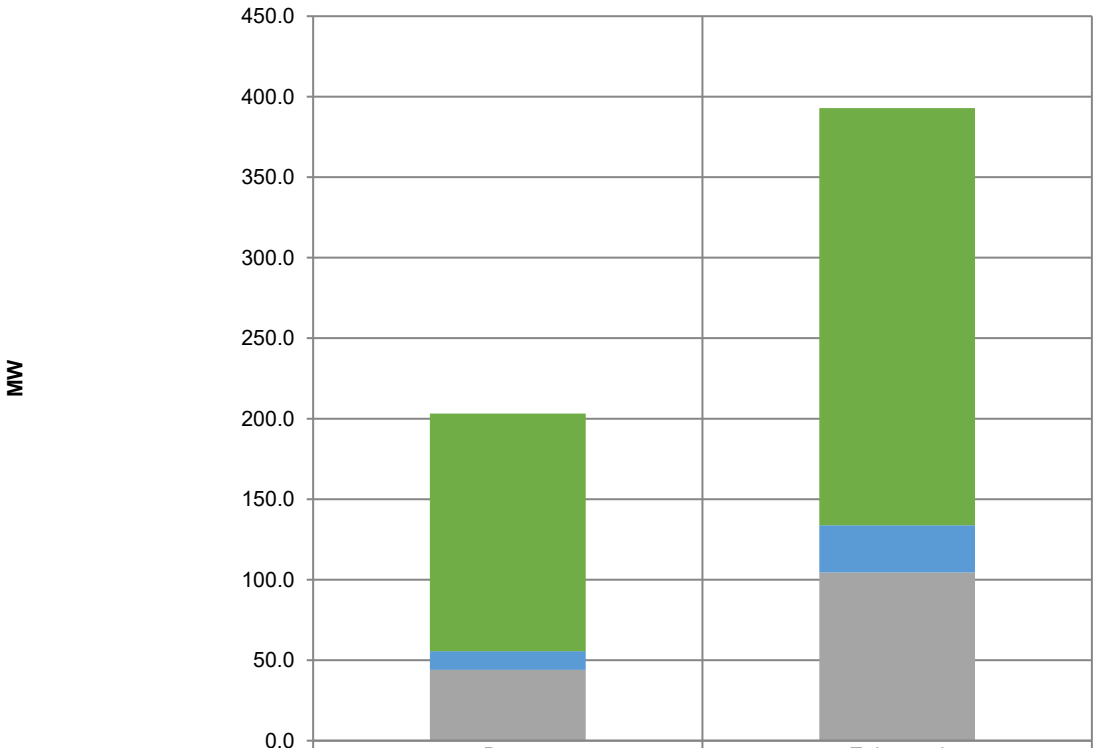
MPS - Incremental DR Achievable Potential by 2045

DR Summer Program Potential (MW)



	Base	Enhanced
Large C&I	256.4	383.8
Small and Medium Business	32.4	38.9
Residential	37.4	132.6
	326.2	555.3

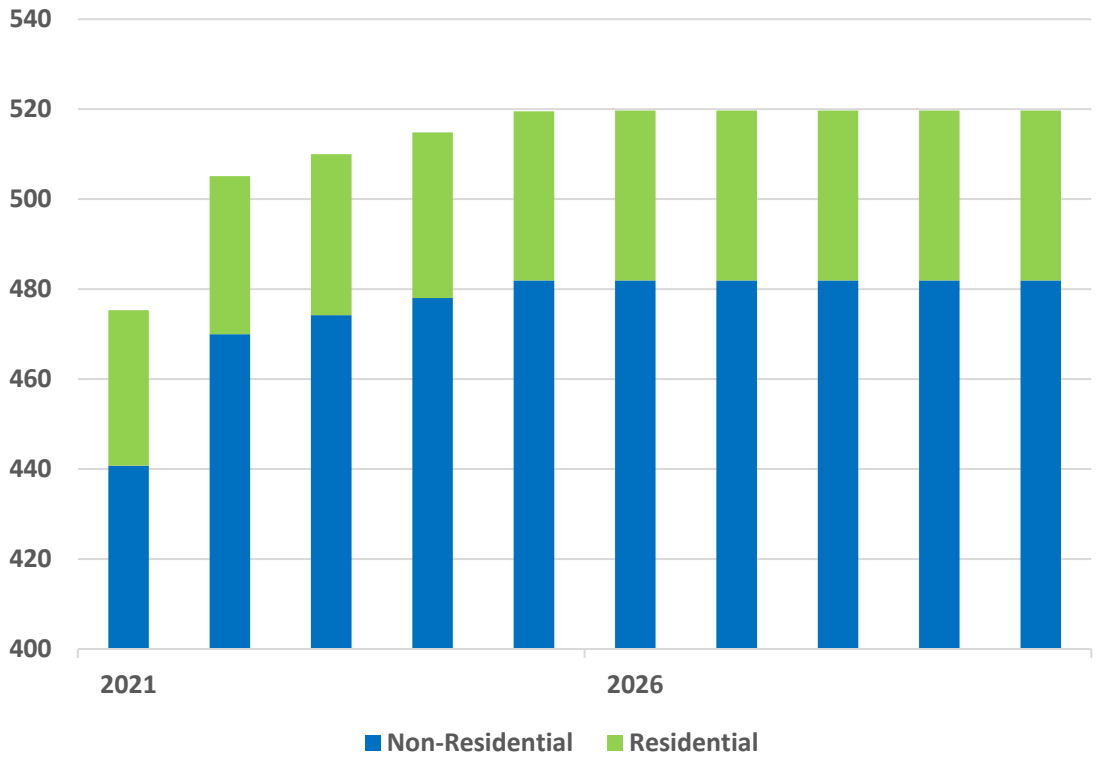
DR Winter Program Potential (MW)



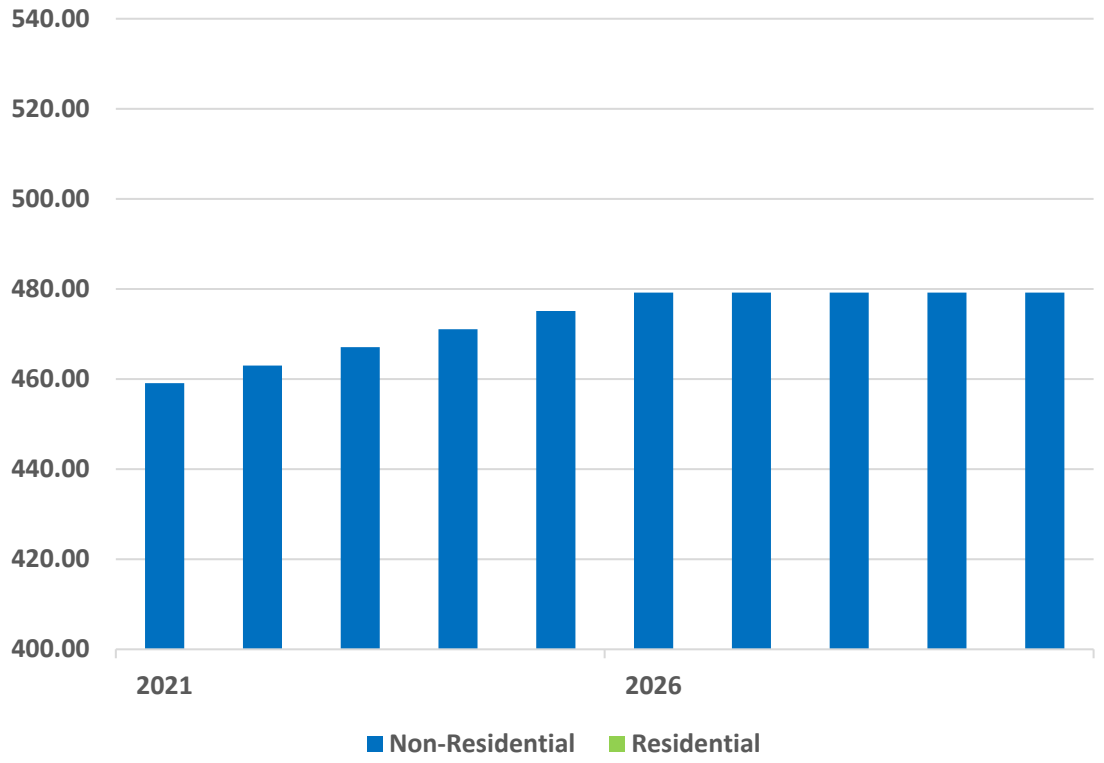
	Base	Enhanced
Large C&I	147.6	259.1
Small and Medium Business	11.7	29.3
Residential	44.0	104.5
	203.3	392.9

2021 IRP DR Forecast

Summer Capability (MW)



Winter Capability (MW)



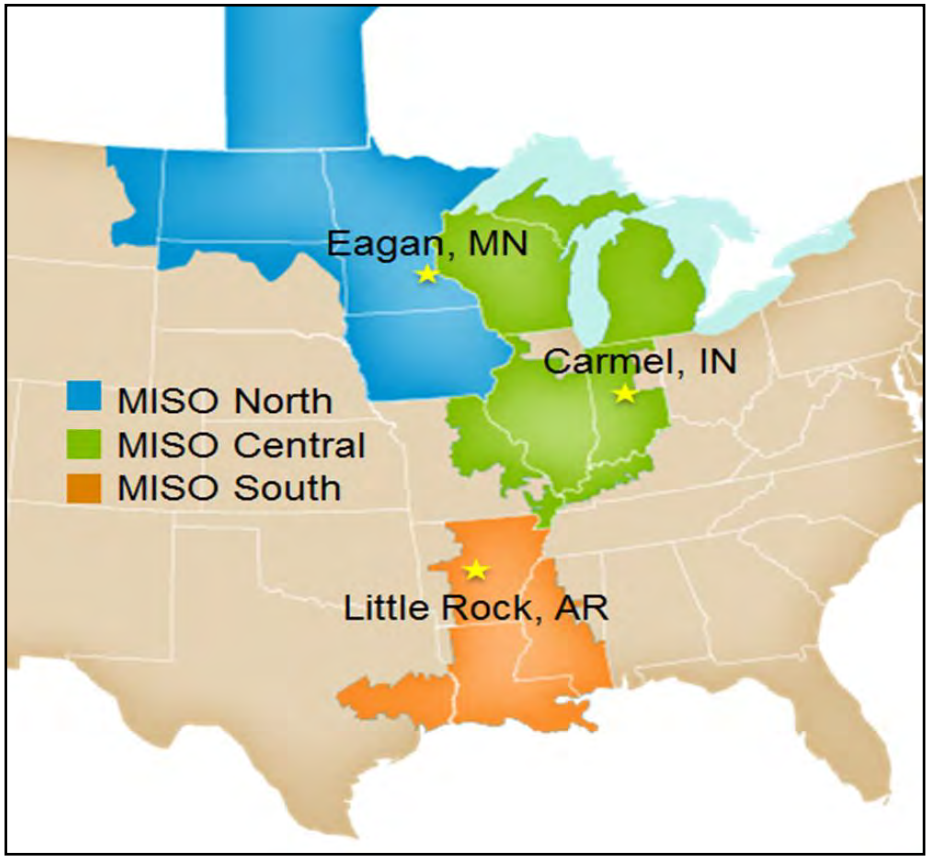
Questions?

Duke Stakeholder Meeting

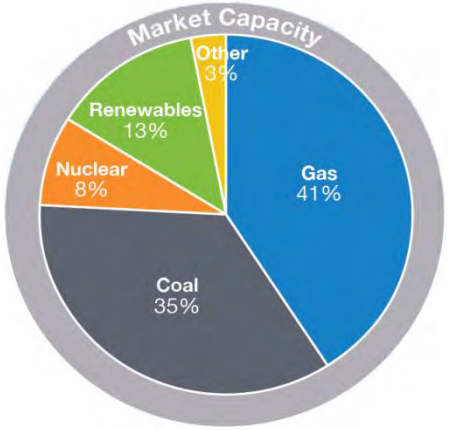
August 4, 2021

MISO drives value creation through efficient and reliable markets, operations, planning, and innovation

Our Vision: To be the most reliable, value-creating RTO



MISO by-the-numbers	
High Voltage Transmission	65,800 miles
Generation Capacity	174,000 MW
Peak Summer System Demand (07-20-11)	127,125 MW
Customers Served	42 million



MISO Corporate Fact Sheet

MISO's Key Functions

1. **Keeping the Lights On:** Safe and reliable operation of the electric grid
2. **Operating Open Energy Markets:** Scheduling and economic dispatch of generation to support reliability and efficiencies across the system
3. **Performing Transmission Planning:** Comprehensive expansion planning that meets reliability needs, policy needs, and economic needs

The February Arctic Event and other challenges reaffirm and add urgency to MISO's Reliability Imperative efforts

Early 2010s

2011
Texas
Cold Weather
- 4 GW load shed
- 3.2M people affected

Southeast
Tornado Outbreak
- 300+ transm. towers down

Southwest
Heat wave
- 12-hour power failure
- 2.7M people affected

2012
Eastern US
Derecho Blackout
- 4.2M people affected

East Coast
Superstorm Sandy
- 8.6M people affected

Mid 2010s

2014
Midwest, East Coast
Polar Vortex
- Forced Outages: PJM 38 GW, MISO 29 GW

2017
Texas
Hurricane Harvey
- Forced Outages: 10 GW

Late 2010s

2018
Gulf Coast
Hurricane Michael
- 1.7M people affected

East Coast
Bomb Cyclone
- Record gas deployment

2019
Midwest
Polar Vortex
- Forced Outages: PJM 21 GW, MISO 30 GW

2020
California
Heat & Wildfires
- Rotating blackouts

MISO South
Hurricane Laura
- 500 MW load shed

2021
Texas, LA, +
February Arctic Event
- 4M people affected
- 30 GW forced out
- 20 GW load shed

Lessons Learned

- Resource Availability - Generation performance is always critical
  - Accreditation
  - Resource adequacy planning must be refined
- Transmission is vital to moving electricity to where it is needed most
- Future operations will require improved tools and information
- Key roles must be adjusted to collectively ensure reliability

MISO

Report posted at misoenergy.org

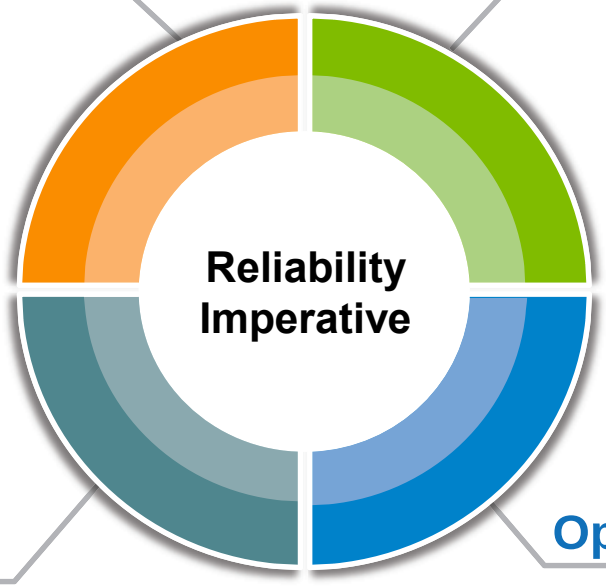
The Reliability Imperative efforts will enable member / state goals with coordinated enhancements across multiple areas

Market Redefinition

Aims to ensure that resources with needed capabilities and attributes will be available in the highest risk periods across the year

Long Range Transmission Planning (LRTP)

Assesses future transmission needs holistically, reflecting utility/state plans for new generation; will also consider potential cost-allocation changes



Market System Enhancements (MSE)

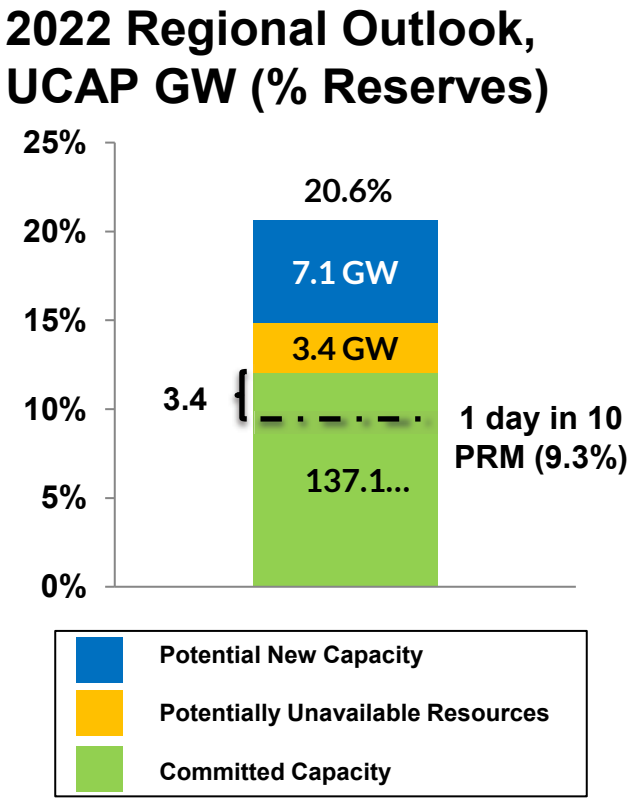
Transforms MISO's legacy platform into a flexible, upgradeable, and secure system that can evolve for years to come; will also integrate advanced technologies to process increasingly complex information

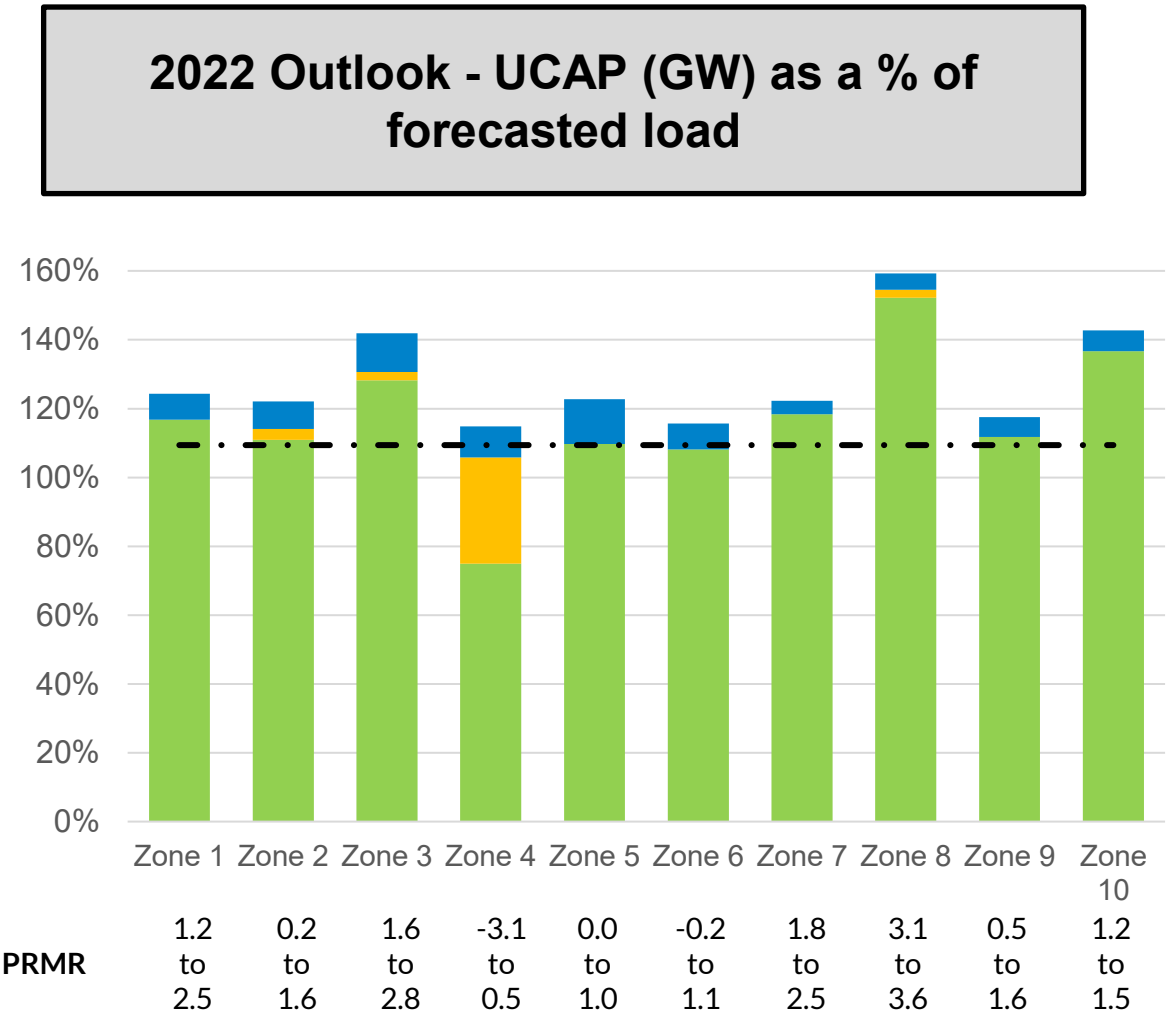
Operations of the Future

Focuses on the skills, processes, and technologies needed to ensure MISO Operations can effectively manage the grid into the future under increased complexity

MISO Response to the Reliability Imperative

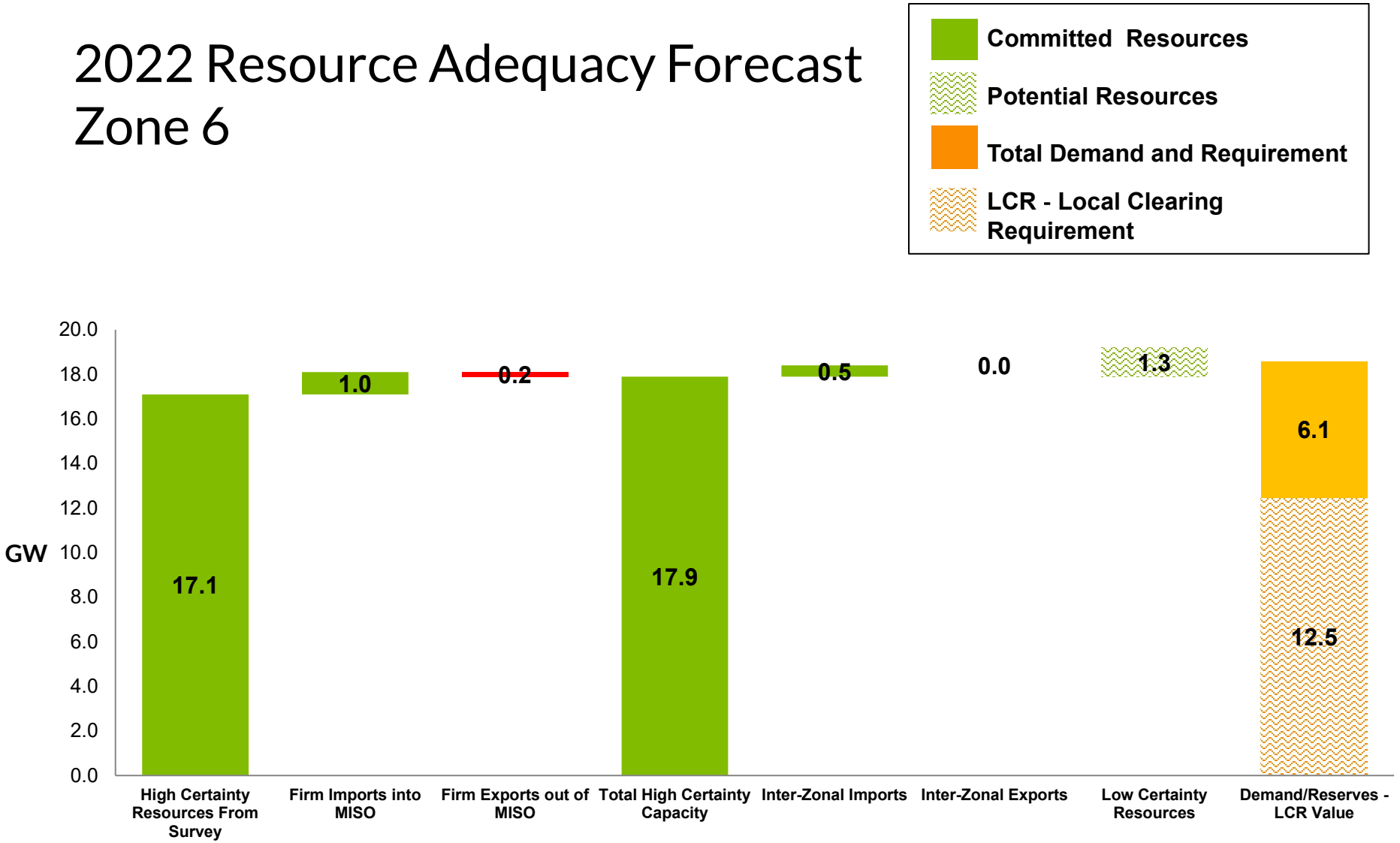
In 2022, regional surpluses and transmission remain sufficient to cover zones with potential resource deficits





Zonal Committed Capacity values include inter-zonal transfers.

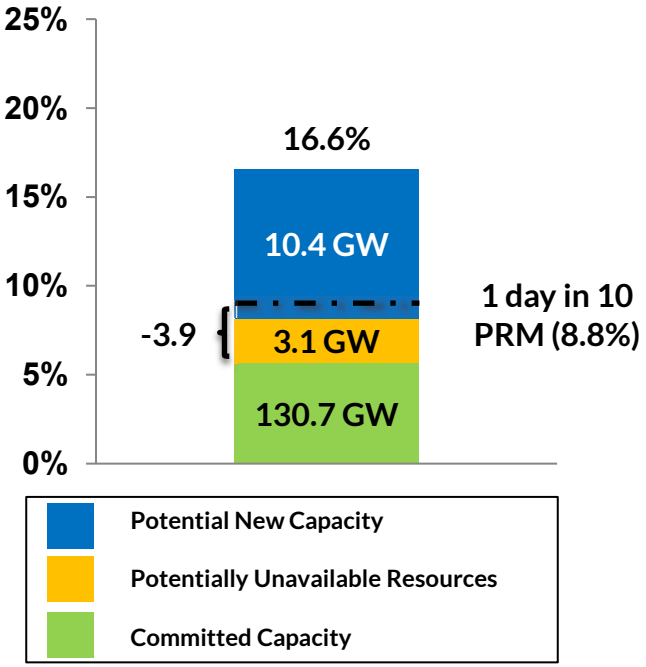
2022 Resource Adequacy Forecast Zone 6



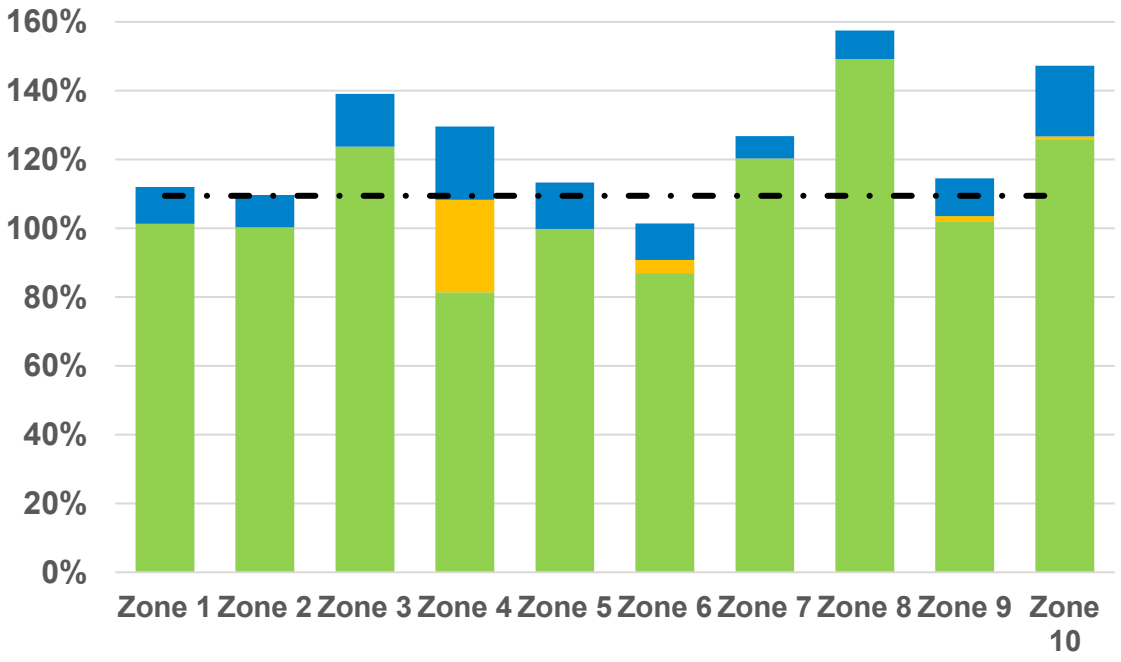
Potential new resources are represented at their expected capacity credit and projected queue certainty factors from slides 10 and 11

By 2026, while at least 4 GW of additional Committed Capacity is needed to meet regional requirements, 5 zones must convert Potential Capacity to Committed to be self-sufficient against their local Requirements

2026 Regional Outlook, UCAP GW (% Reserves)



2026 Outlook - UCAP (GW) as a % of forecasted load



GW above PRMR	-1.4 to 0.4	-1.2 to 0.0	1.2 to 2.6	-2.5 to 1.8	-0.7 to 0.3	-3.9 to -1.4	2.1 to 3.3	2.9 to 3.5	-1.4 to 1.0	0.7 to 1.7

Zonal Committed Capacity values include inter-zonal transfers.

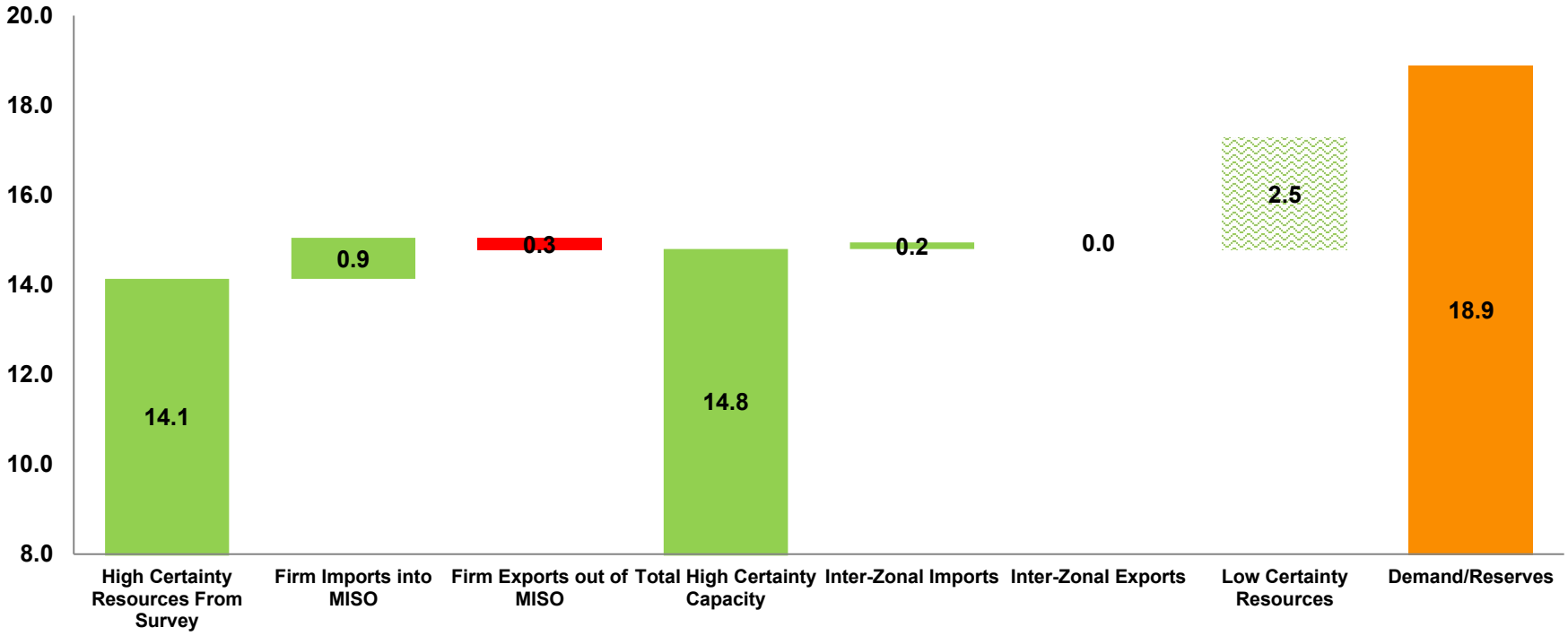
2026 Resource Adequacy Forecast Zone 6

Committed Resources

Potential Resources

Total Demand and Reserve Requirement

Zone 6 2021 OMS MISO Survey GW (UCAP)



Potential new resources are represented at their expected capacity credit and projected queue certainty factors from slides 10 and 11

MISO expects to rely more heavily on increased transparency in the planning horizon coupled with market price signals in the operating horizon to incentivize needed resources

RESOURCE ASSESSMENT

MISO will provide a forward assessment to stakeholders with transparency of forecasted system needs (for capacity and flexibility) versus expected system capabilities based on the aggregation of member plans

MEMBER CAPACITY TO MEET FORECASTED NEEDS

Proposing changes to the current RA construct to assess members' capacity to meet forecasted needs; Planning to move to sub-annual Planning Resource Auction construct

PRA MECHANISM AND AUCTION STRUCTURE

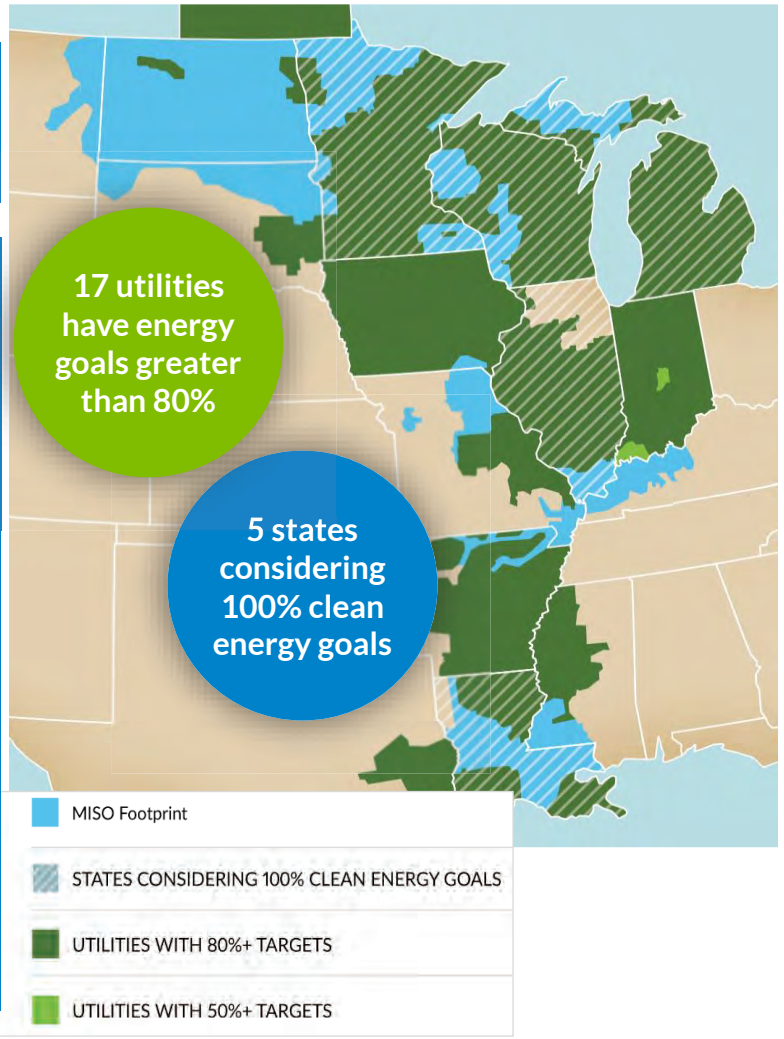
Planning Resource Auction process remains as mechanism to ensure compliance with reserve margin requirement with no substantive changes to auction structure; additional 50% minimum requirement

INCREASED RELIANCE ON ENERGY MARKET SIGNALS

Energy markets to address the challenges of the changing fleet; leverage energy and ancillary service markets to incentivize resources to provide sufficient energy and ramping capabilities in the operating horizon

MISO Futures build on members' resource plans and changing demand patterns, including implications of electrification

Future 1	Future 2	Future 3
• Resource fleet develops in line with 100% of state RPS and utility IRPs; 85% of state and utility goals, announcements, or preferences • Load growth consistent with current trends	• Companies/states meet their goals, mandates and announcements • Carbon emissions reduced 60% by 2040 (2005 baseline) • Energy increases 30% footprint-wide by 2040 driven by electrification	• Companies/states meet their goals, mandates and announcements • Carbon emissions reduced 80% by 2040 (2005 baseline) • Energy increases 50% footprint-wide by 2040 driven by electrification

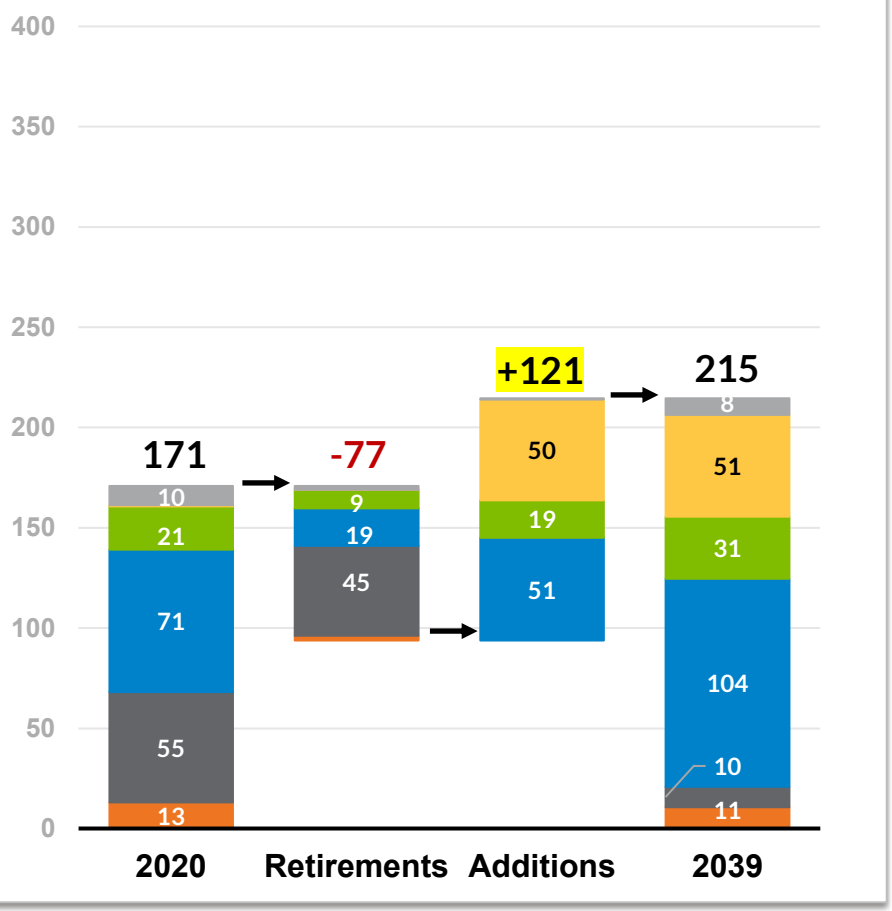


MISO Futures Report
https://cdn.misoenergy.org//MISO%20Futures%20Report538224.pdf

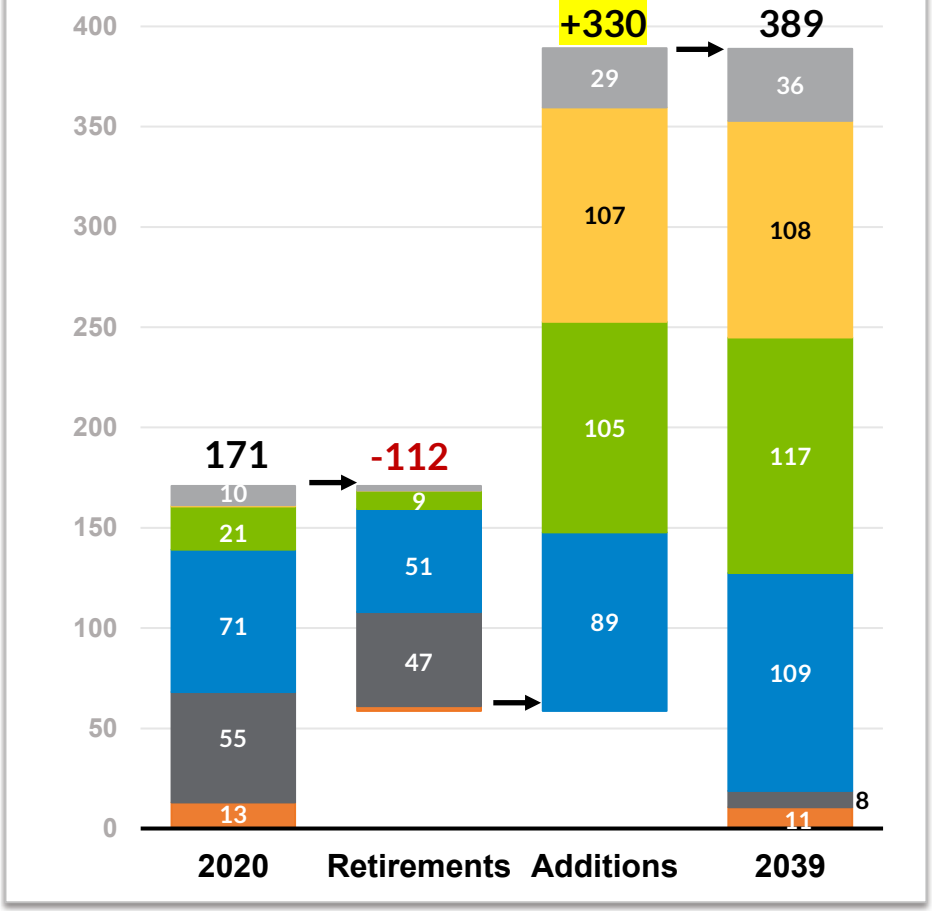
As of late 2020; changing rapidly

MISO Futures reflect the significant capacity retirements and additions that are planned

Future 1



Future 3

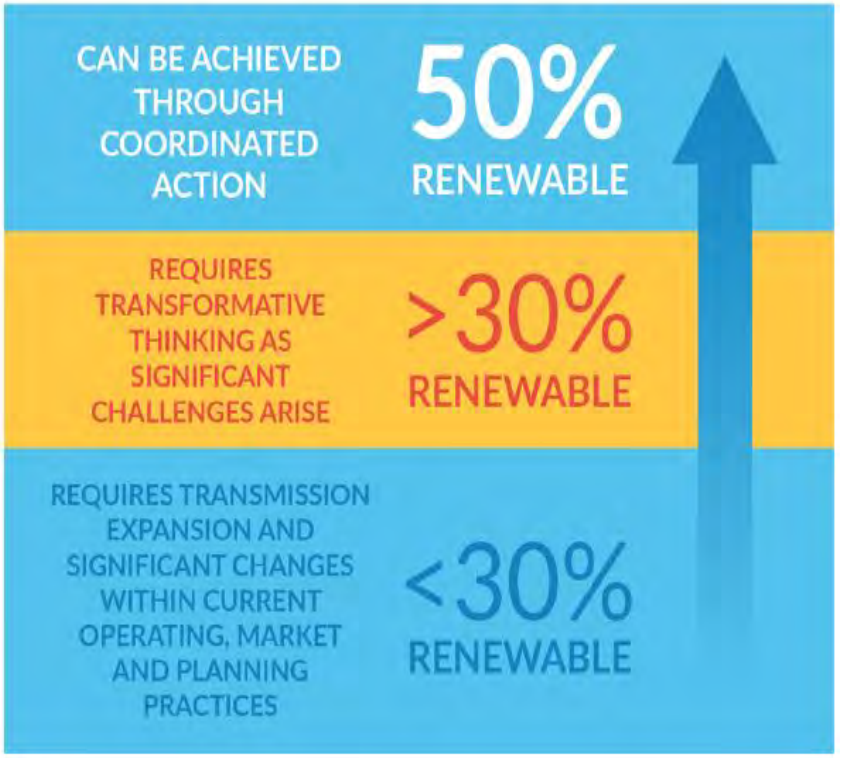


MISO Nuclear Coal Gas Wind Solar Other

Growing renewables are driving localized reliability issues now; the Renewable Integration Impact Assessment finds that these challenges will become footprint-wide beyond 30% system-wide renewable penetration

Risk patterns are shifting, and new risks are emerging due to the increasing penetration of wind and solar in the region

- ***Stability Risk*** requires multiple transmission technologies, operating and market tools to incentivize availability of grid services
- ***Shifting periods of grid stress*** requires flexibility and innovation in transmission planning processes
- ***Shifting periods of energy shortage risk*** requires new unit commitment tools, revised resource adequacy mechanisms
- ***Shifting flexibility risk*** requires market products to incentivize flexible resources
- ***Insufficient transmission*** requires proactive regional transmission planning

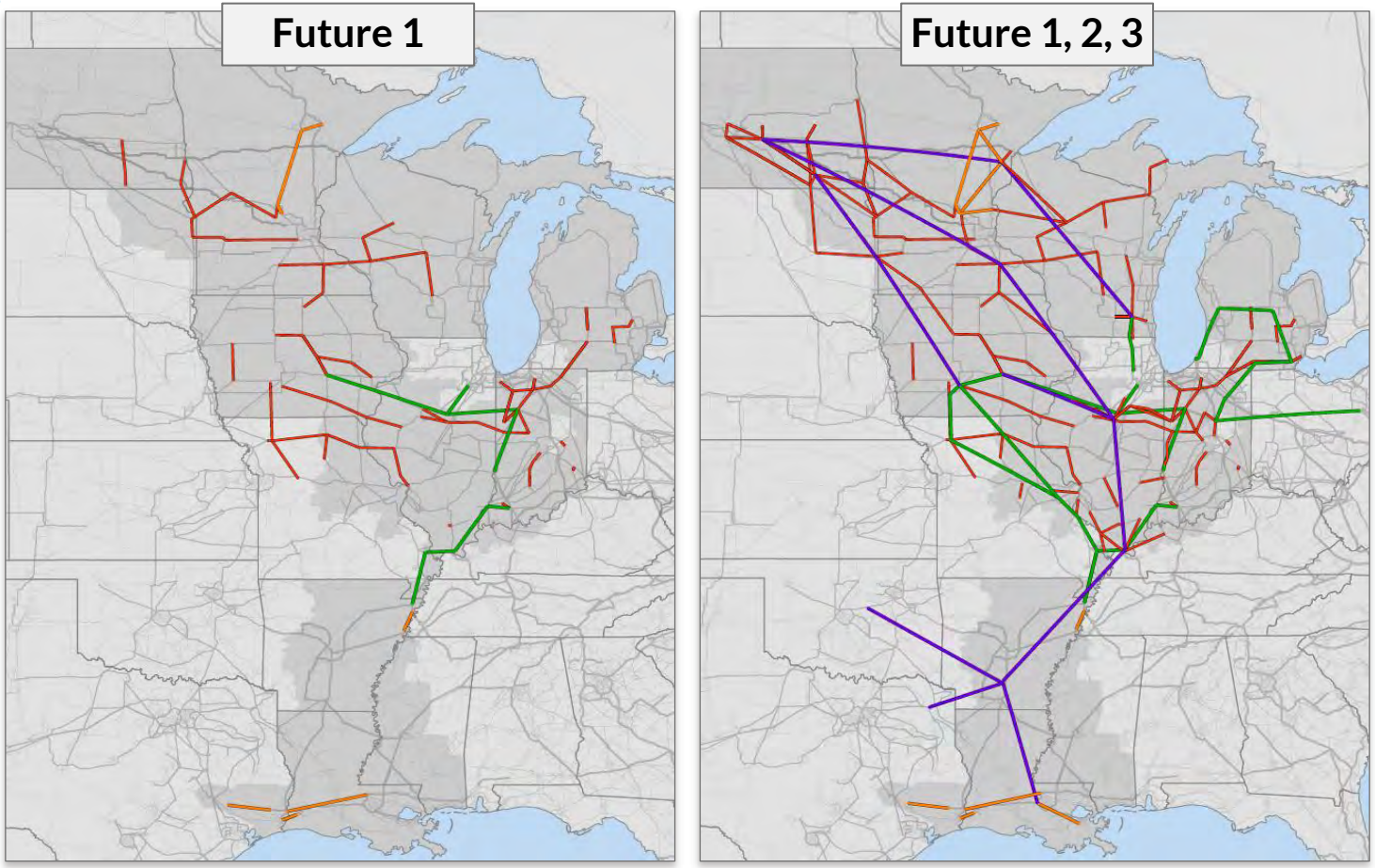


Adaptation within the existing planning, market, and operations constructs will suffice – but only to a point. New and changing risks require new practices to mitigate.

MISO

Long Range Transmission Planning projects will promote regional energy transfer, interzonal support, resource integration, and retirements

Indicative 'Roadmaps'
(as of June 2021)



* *Initial 'indicative' investment cost estimates expressed in 2020$s; generation additions thru 2039 are 121 GW in Future 1, 330 GW in Future 3; generation costs from EGEAS modeling; transmission solutions cost from MISO transmission cost estimating tools.*

Indicative 'Cost to Achieve'* ($ Billion)	Future 1	Future 1, 2, 3
New Generation/Resources	+/- $ 135 B	+/- $ 430 B
New Transmission Solutions	+/- $ 30 B	+/- $ 100 B
Total New Investment	+/- $ 165 B	+/- $ 530 B

Closing Comments, Stakeholder Comments

Wrap Up

- Meeting survey to be sent out in the next week to attendees
- Comments can also be sent to:
  - Scott at: scott.park@duke-energy.com
  - Stewart at: stewart@vanry.com
- Meeting summary and other materials will be posted on website by Aug 12
  - https://www.duke-energy.com/home/products/in-2021-irp-stakeholder
- Next workshop expected to be in late August

Acronyms

AMI	Advanced Metering Infrastructure
CHP	Combined Heat & Power
CPP	Critical Peak Pricing
CS	Small Commercial
DR	Demand Response
DER	Distributed Energy Resource
DEI	Duke Energy Indiana
DSM	Demand Side Mgt (EE + DR)
EV	Electric Vehicles
EE	Energy Efficiency
EIA	Energy Information Administration
IURC	Indiana Utility Regulatory Commission
IRP	Integrated Resource Plan
LBNL	Lawrence Berkeley National Lab
LMI	Low-Medium Income
MW	Megawatt
NEM	Net Energy Metering
NDA	Non-disclosure agreement
PPA	Purchase Power Agreement
PVRR	Present Value of Revenue Requirements
RFI	Request for Information
RS	Residential Standard
RE	Residential Electric
TOU	Time of Use
TOUD	Time of Use with Demand
T&D	Transmission and Distribution
UCAP	Unforced Capacity
UPC	Usage per Customer
VPP	Variable Peak Pricing
VPPD	Variable Peak Pricing with Demand

#	Question	Asker Name	Response Type	Answer(s)
1	no question - slight confusion over title sheet in deck provided for this meeting - says June 21.	David Ciarlone	Written	thanks. We will fix that for the record.
2	Is there a participants list provided for this meeting?	Michael Mullett	Written	Yes we will provide that with the meeting summary. It may not be complete as some attendees dial in and we do not have a name associated with that number
3	Not clear that ownership does not impact cost, which could impact dispatch etc.. etc... How do we ensure there is no difference?	David Ciarlone	Written	Hi David - could you clarify the question? I'm not sure I'm following.
4	Is there a day/time set yet for Workshop 5b?	Tim Lasocki	Written	Not yet. We will get it set soon.
5	Scott, did I hear you correctly when you said that you are assuming Duke ownership of all new resources in your modeling? We would definitely have some concerns about that. As you likely know, tax normalization rules require ITC benefits (for solar and paired storage) to be realized over the asset's life instead of accelerated recovery as can be done if the asset is not owned by an IOU. That raises the cost of solar and storage by 20 - 30%. So why would you assume that customers have to pay more for these resources than they actually would have to if equal consideration were given to owned and contracted resources? Note also that there are some ways for IOUs to get around these rules if they are not using existing interconnection rights. A wholly owned LLC can be used to leverage the full value of the tax benefits.	Anna Sommer	Live Answered	One - when we look at the MISO level modeling we are assuming a utility ownership structure and that is consistent with all resources. Some of those resources get selected and then dispatched for the power price. When we get to the DEI level modelling we will do some runs where we still maintain some consistency between the DEI level and the MISO level modelling and in doing so that will select a level of megawatts. Regarding the tax structures, when we issue the RFI, we will look at that as a sensitivity. When this will all come together is after we have done the IRP we will issue an RFP which will give us options in terms utility ownership, build own transfer, different tax equity structures - This will all get sorted out in the analysis or the RFP results.
5a	(ANNA QUESTION CLARIFICATION LIVE) Are you saying you will assume Duke ownership for MISO and DEI modelling but that you would do a sensitivity analysis that would NOT assume Duke ownership?		Live Answered	Scott - We have the RFI results and we need to see how we can extrapolate that to the MISO level modeling. We don't want any implicit arbitrages in the model to give us skewed results. Anna - Yes, The RFI results are useful from a number of perspectives, and its not just from the perspective of if owned resources are more expensive than contracted resources, but also from the standpoint of having market data be used as the baseline assumptions for the capital costs of those new resources. I do think there is a separate issue about how you treat ownership of resources. Because you have the option of creating an LLC which gives you the opportunity to capture those tax benefits I don't know why you would not take out tax normalization as part of your assumptions. Stewart - Scott, I know this is a conversation you all have been having internally. The point Anna is making is a good one. One of the concerns she is trying to take care of is that if you make assumptions that don't take into account some of the tax implications - artificially increasing the apparent price of those resources and therefore not selecting them, or selecting them at a later stage. I know that this is something you have been looking at. How do we build this into the model effectively so that we are taking into consideration both the benefits of utility ownership in terms of how it shows up in MISO, but also the tax benefits if it were financed through a different mechanism? Anna Yes, I agree with that Stewart, and I think we can set aside the apparent disagreement between CAC and Duke about how the RFI are used, and just focus on the ownership question. You can make the assumption of not needing to normalize those tax credits regardless of the source of those capital costs. Yes, this is the concern. and I think that is a concern regardless of what the market. We are concerned with the disadvantage being given to solar and solar paired with storage versus the other resources competing for the energy expansion. This is on point to whether modelling can survive the optimal portfolio or not Scott - I think we are closer than it might appear. We will look at this internally and be ready to propose a response that we can talk about at the next meeting. Follow up: DEI changed modeling input for renewable costs to use tax equity cost assmptions
6	I've been told that you are going to compare and contrast the portfolios that you are considering to Texas and California's portfolios what are you looking for to make sure that we do not have the same issues that they have had?	Cortney Galbraith	Written	We will compare different portfolios, some with mostly renewables, some with a combination of coal, gas, renewables, etc. We will demonstrate how much each of the portfolios would rely on the market versus which portfolios rely less on the market, and can be served more with the resources owned. Ultimately, the preferred portfolio will be one that allows us to reliably serve our customer's load.
7	Does info on page 9 mean that you would only expect a 1- 1.5% reduction in consumption over each of the next 5 years?	Ray Wilson	Written	If you rely on historical take up of programs then yes, we believe that the uptake will result in those levels of reductions.
8	Question re bullet 3 on last slide: What is assumption re existing generating facilities capacity factors used in modeling?	Michael Mullett	Written	Sure. But, there is a limit on how much of that is achievable. The large additions of solar and wind contemplated will have to include some large scale projects that will need transmission expansion.
9	As we are spending billions of dollars to go to clean energy what are we doing now for the current equipment that is aging significantly and is going offline with the slightest shift of the wind? How is this being addressed? The same customers are constantly losing power.	Cortney Galbraith	Written	This process is focused on the generation resources. But, Duke Energy has many other programs where we are focused on reliability of the delivery system - our TDSIC program has made great investments that improve reliability and we plan to continue that investment. We also have ramped up vegetation management around the lines, which can be a big cause of outages.
10	So, the load being met by model selection would be the forecast less that load projected to be met by running existing generation at historic capacity factors?	Michael Mullett	Live Answered	We do not take the EE bundles as a tool for reducing the load. We drop them into the model as if they were generating resource that has a cost, but no variable cost, and then the model would pick up the bundles as they are economic. EE bundles are not automatically selected but only when they are more economic than other resources. The model can pick different levels
11	Please have Brian read the question he is answering	Ray Wilson	Live Answered	Thanks we will make that happen
12	But, my question relates not to EE but the cost competition in the model between EE and existing generation on what time frame, an hourly, weekly, monthly, annual basis	Michael Mullett	Live Answered	(Mike asks this live) The models do have hourly resolution. The capacity expansion model may be different. When the model is doing resource selection it uses hourly data - we used levelized costs. We wanted to make sure that model captures the EE benefits. Levelized costs for EE allow us to include benefits that may occur beyond the modeling horizon. We are not using levelized costs for generation because they do not operate as a fixed resource. We wanted to make sure the EE bundles were not unfairly disadvantaged. We wanted to capture the benefits that go on beyond the planning window.
13	Why did you exclude this approach in the 2021-2023 time period?	Leslie Webb	Written	We already have an IURC approved EE/DR plan for that time period. So we hardwire in the results of those already approved programs.
14	EnCompass actually does turn capital costs into carrying charges if they are not already input as levelized charges.	Anna Sommer	Live Answered	Brian acknowledges this as part of the answer to Mike's last question.
15	Thanks Stewart!	Anna Sommer	N/A	
16	Does roll off reflect any adjustment other than end of measure life?	Dan Mellinger	Live Answered	When the life of the EE bundle ends, you don't assume that someone is going to be going back to something that is less efficient. This is baked into our load forecast and it brings the load forecast down. These savings do not disappear, they are accounted for somewhere else in the planning process.

#	Question	Asker Name	Response Type	Answer(s)
17	What is the mechanism to account for it in the load forecast?	Anna Sommer	Live Answered	As we run the models we have to account for that roll off so that we don't lose the savings.
18	Are you recording this meeting, can participants be sent a recording afterwards if they weren't able to attend today?	Megan Anderson	Written	We do not plan to make recording available. We are just using it to be sure we capture all questions and can answer them afterward, then we will delete. We will post the presentation and the summary of questions and answers to the IRP website.
19	So you do a post-estimation adjustment of the load forecast?	Anna Sommer	Live Answered	I will have to talk to load forecasting folks, but I agree we have to account for the correct amount of roll off
20	Ok, thanks Brian.	Anna Sommer	Live Answered	
21	Kelly can you send the link to the Q&A answers when it's completed then, it has been hard to find the Indiana IRP info on the website from time to time	Megan Anderson	Written	here is the link to website - the materials will be under the workshop links. I'll follow up with Scott, maybe we can send an email when the Q/A document is posted with the link. https://www.duke-energy.com/home/products/in-2021-irp-stakeholder
22	Kelley** my apologies	Megan Anderson	Written	No problem!
23	Are you addressing wholesale as well as retail DR? If so, how?	Michael Mullett	Live Answered	We do address both, our planners and the market potential study look at all the residential type programs, small and medium size businesses, and large industrial customers. We break it out by all customer classes and the uses they have. We look to enroll customers - residential through industrial - in our programs.
24	Will the MISO presentation later today address the changing manner in which DERs including DR will be participating in the wholesale market in the future? How are these changes in the wholesale market being incorporated in the IRP modeling as time goes by?	Michael Mullett	Written	I would think Melissa may cover that at a high level. We'll see. As we learn more about the impacts of FERC 2222 that will be incorporated into assumptions around DR. Today, there is not a good idea on what the impact may be. Too early to tell.
25	Can you confirm that the 2021 value represents actual current enrollments, and the increase shown in 2022+ represents added potential identified by Nexant? Do you know what % of peak load this represents?	Dan Mellinger	Live Answered	The 2021 should be close to the current enrollment. This is the build up of the internal forecast. The Market Potential Study guides the internal assumptions around program enrollment and growth and impact. I can't say specifically that 2022 is directly taken from the MPS but typically they would look at what the recent MPS would provide and they would grow their forecast toward that. They would use that as a target for assumed growth in program enrollment. There may be some small differences but we are continuously refining these numbers. We will continue to use the MPS for this.
26	Are you starting to factor in the potential for EV charging DR?	Ray Wilson	Written	Yes. Our load forecast has assumptions about EV charging included. Also, some of the scenarios may use an even higher assumption for more aggressive adoption.
27	Going back to slide 8 - Can you help me understand how you go from 24% to less than 2%?	Leslie Webb	Live Answered	We cannot assume that all customers are going to adopt at 100%, we try to estimate what is ACTUALLY possible to get for customer enrollment. We have seen even free lightbulb programs are adopted at only a 50% customer adoption. We do not have control over customer decision. 24% is the highest potential and the 2% is what we actually expect to happen based on historical uptake in programs.
28	Why does Slide 15 show DR plateauing in 2025-26?	Michael Mullett	Live Answered	This is the forecast based on our internal program budget, where we only do the detailed budget out for 5 years. This is our base line, but we are also using the MPS to craft a high DR scenarios where we can begin to show incremental additional going beyond 2025.
29	Leslie: 24% is based on cumulative economic savings over 25 years. 1.1% is an annual figure.	Dan Mellinger	Live Answered	yes
30	Follow up to Kelley's response: Would the uncertainty you reference call for a sensitivity rather than no consideration given the potential importance of O2222?	Michael Mullett	Written	The enhanced DR look that Brian showed could be thought of as a proxy for FERC 2222, I think.
31	So, the base case plateaus?	Michael Mullett	Live Answered	We will be using the MPS data to craft alternative scenarios where we could show what the additional growth going out beyond 2025 looks like.
32	Can you answer my question regarding the potential possibilities relating to Electric Vehicles	Ray Wilson	Live Answered	(live answered - see next)
33	Oh I see you sent an answer.	Ray Wilson	Written	ok. Thanks
34	I'm sorry, I'm not totally following, could ask an oral question?	Anna Sommer	Live Answered	
35	What geographic area is Zone 4 and why is there so much more Potentially Unavailable Resources in that Zone compared to others?	Michael Mullett	Live Answered	Zone 4 is Illinois and Illinois is a deregulated state. They have a significant amount of coal capacity that is under scrutiny that might have to retire because its uneconomic. MISO has a number of coal facilities that are considering shutting down because of it being uneconomic n the market and them not being able to recover their fixed costs.
36	What % of the 7.1 GW of new capacity within MISO is renewables?	Jim Grimes	Live Answered	For Zone 6 that represents the blue bar on the slide (page 22) represents all renewable capacity and its capacity that is accredited.
37	Were the generator trips during the February event mostly in MISO - South? Was there any area of MISO - North where that was particularly a problem?	Anna Sommer	Live Answered	It happened in both the south and the north footprints. We had generator trips and a lot of folks that we tried to start up could not start up because as soon as they tried to start up they tripped off line. We also had fuel availability issues for folks who were unable to get gas. So we did have forced outages in both the north and south. The south, because of colder weather etc. had more concerning forced outages.
38	What is the LCR level in 2026 for Zone 6?	Dale Thomas	Live Answered	We haven't calculated a new LCR for 2026. so you can assume it will be the same, assuming you don't have any changes to your import capability. You have enough resources to meet your Local Claim Requirement so you can import from other zones to meet your overall requirement.
39	Would you explain the MISO-PJM seam and its implications for Zone 6 (Indiana), especially as it relates to the AEP/I&M role in Indiana transmission resources?	Michael Mullett	Live Answered	For planning resource options and for what you are seeing today, we do have we have firm imports from PJM that are to be used by MISO. We have a few of those that we include in the planning resource option. All other non firm imports from PJM would not be included as firm capacity or shown as available to meet resource requirements.
40	How does the IRP address the increase in extreme weather due to climate change? We don't need more carbon-based fuels which are the root drivers of climate change and severe weather. Shouldn't we be QUICKLY building out transmission that supports clean energy over a wide footprint? A recent NYT article points out that climate change is happening more rapidly than most utilities/RTO are prepared for. It says utilities have assumed "… the impacts of climate change and extreme weather would unfold more gradually and there would be more time to prepare. But in the past few years, the entire industry has really been smacked upside the head.' https://www.nytimes.com/2021/07/29/climate/electric-utilities-climate-change.html#:~:text=Utilities%20are%20fighting%20to%20keep,flooding%20fueled%20by%20global%20warming.&text=A%20group%20of%20homeowners%2C%20fearing,to%20turn%20off%20their%20electricity.	Leslie Webb	Written	As we've discussed we are looking at a climate change forecast working with Purdue. We know the future holds a clean energy transition and that will help address climate change. You'll see more details on that when we start showing the various proposed portfolios.
41	I assume slide 29 refers to the RIIA study? That study looked at just the addition of more wind and solar, but didn't include additional storage or demand-side resources. I think you are looking at the impact of storage in Phase 3 of RIIA, right? When will that be available?	Anna Sommer	Live Answered	Yes -this is correct. I think they are ongoing with that now, but it will be will be quite some time before we have Phase 3 or the next iteration of this available. I think it has some storage but not enough to deal with the flexibility issues that we see. Storage can help with a lot of the other pieces of the puzzle related to renewables.
42	Would you explain the physical vs. jurisdictional realities of the electric transmission and distribution systems? How does MISO Future 3 reconcile the dichotomy between the physical and jurisdictional realities?	Michael Mullett	Live Answered	Future 3 is quite a build out. We have a hard enough time with our states getting routing to deal with the transmission that you see in Future 1. We are trying to do it on existing corridors to minimize some of the footprint issue that we see opposition to in our jurisdiction. And also to get to Future 3 you will need some significant materials and things that will be hard to find. It is very hard to route this over various states and jurisdictions. The actual material availability can be a challenge. There will be challenges where our policies want to go in the logistics and the actual ability to construct and get approvals in the right timeframe.
43	Great, thanks Melissa!	Anna Sommer	Live Answered	you're welcome
44	Would greater expansion of local electricity generation (e.g. rooftop solar) reduce the need for transmitting so much electricity within and across zones?	Jim Grimes	Written	Sure. But, there is a limit on how much of that is achievable. The large additions of solar and wind contemplated will have to include some large scale projects that will need transmission expansion.
45	Please bring Order 2222 into the discussion of Future 3 vs. Future 1.	Michael Mullett	Live Answered	I don't know the answer. I don't know how much we are going to see out of Order 2222 and how it will impact the future.

#	Question	Asker Name	Response Type	Answer(s)
46	What are MISO's assumptions regarding electric vehicle penetration? How does EV penetration affect the results.	Emily Medine	Live Answered	Future 1 has a pretty low penetration of electric vehicle utilization. Futures 2 and 3 you will see in the in the boxes that the energy increases is 30% footprint wide because of electrification and 50% footprint wide for Future 3. We have more aggressive assumptions for Futures 2&3 through electric vehicles and electrification in general.
47	Does the Biden infrastructure plan cover some of these costs for transmission buildout in Future1 or 3?	Leslie Webb	Live Answered	There is a provision in the latest bill where the federal government would be an anchor where they would build it and they would assume that generators and others would pay for it, and potentially subscribe to it. It is not a system that we have today, but there is the money in the bill before the senate that would enable this to be paid for. It would be them paying and then they would solicit people to purchase it from them. I recall that there is something in the bill that about siting on federal land and making that more streamlines, but I don't recall if there is anything in the bill that would provide a federal siting pre-emption.
48	It sure looks like the more solar panels and storage put where the electric is used the better!	Ray Wilson	Written	Agree. Although it's also generally more costly than the bigger solar/ wind projects. It will take all the above, I think.
49	CAISO and NYISO have filed their Order 2222 Compliance Plans; PJM will do so in October, I believe. Do you expect MISO to meet its current (later) Order 2222 Compliance Plan filing date?	Michael Mullett	Live Answered	Yes - there are a filing date and implementation date. I think we will achieve the filing date
50	Ray, we've certainly seen in another study we did that the co-location of distributed solar and battery storage across a feeder dramatically reduces the need to upgrade distribution lines and of course avoids transmission upgrades.	Anna Sommer	N/A	(no reply as this was a response to Question 48)
51	Absolutely. We all need to agree and get on with it.	Ray Wilson	N/A	(no reply)
52	Maybe if we could reduce some of the transmission costs and losses in transmission it would make locally produced electric look more attractive.	Ray Wilson	Written	Yes. Keep in mind that you can only include about 20-25 MW of solar on the distribution system at any given point. Larger installations will have to interconnect on the transmission line.
53	Tried twice to submit poll -- failure both times	Michael Mullett	Written	Mike - sorry about that we will be sending an additional poll out shortly
54	so the IRP finalizing dates remain the same?	Megan Anderson	Written	yes
55	THANK YOU!	Leslie Webb	N/A	







2021 Integrated Resource Plan
Stakeholder Workshop #5b

Sept 10, 2021

DUKE ENERGY

Agenda

9:30	Welcome & Protocols
9:45	IRP Regulatory Requirements & Stakeholder Timeline
9:50	Overview of Portfolios & Retirement Analysis
10:00	Optimized Portfolios (4)
10:40	Hybrid Portfolios (3)
11:20	Stakeholder Portfolios (5)
12:00	Lunch Break
1:00	Portfolio Summary & Stakeholder Portfolio Development
1:45	Analytical Framework & Scorecard/Criteria
2:00	Timeline to Submission
2:10	Wrap Up & Portfolio Survey

DUKE ENERGY

What are the Goals of the IRP Process

INTEGRATED RESOURCE PLAN (IRP):

DEI's plan to provide safe, reliable and sustainable energy solutions for our Customers in Indiana.

- IRPs are submitted every three years
- Plan is created with stakeholder input
- 20-year look at how DEI can cost-effectively serve our customers
- Modeling and analysis culminate in a utility preferred resource portfolio

What is a preferred resource portfolio?

"'Preferred resource portfolio' means the utility's selected long term supply-side and demand-side resource mix that safely, reliably, efficiently, and cost-effectively meets the electric system demand, taking cost, risk, and uncertainty into consideration."

IURC RM #15-06, LSA Document #18-127
Link (PDF): https://www.in.gov/iurc/files/RM_ord_20181024141710007.pdf

Roadmap for Stakeholder Process

Workshop 1 Nov. 20, 2020	Workshop 2 Jan. 21, 2021	Workshop 3 April 21, 2021	Workshop 4 June 21, 2021	Workshop 5a (Aug 4) & 5b (Sept 10)	Workshop 6 Oct 6, 2021	Workshop 7 Oct 18, 2021
✓ Goals of IRP ✓ Review of 2018 IRP ✓ Contemplated changes for 2021 ✓ Load Forecasting, including: • Energy efficiency (EE) • Electric vehicles (EVs) • Distributed Energy Renewables (DERs)	✓ Recap ✓ Follow-ups: • Climate change load forecast ✓ Scenario intro ✓ AMI data ✓ Customer Programs ✓ DERs	✓ Recap ✓ Follow-ups: • Climate change load forecast • Request for Information ✓ EE and demand response (DR) modeling ✓ Scenario update ✓ Portfolio creation tool	➢ Follow-ups: • Climate change load forecast • Portfolio tool ➢ Deep dive on scenario assumptions ➢ Connecting scenarios to portfolios	➢ Follow-ups ➢ EE Bundling/ DR deep dive ➢ Retirement analysis ➢ Scorecard ➢ Optimized portfolio results for each scenario ➢ Hybrid and Stakeholder portfolios initial discussions	➢ Follow-ups ➢ Modeling results on sensitivities ➢ Hybrid and Stakeholder portfolios modeling results	➢ Follow-ups ➢ Scorecard ➢ Preferred portfolio and short-term action plan

Stakeholder scenarios due by Aug 20

Stakeholder portfolios due by Sept 20

Evening Q&A Sessions for Customers

January 20, 2021	July 26, 2021

Ongoing technical meetings and data provision

What is a portfolio?

- A scenario is a set of internally consistent assumptions that are external to the utility and beyond its control
  - Needs to include specific assumptions that can be entered into models
  - For example, carbon regulation, fuel prices, cost of new generation
- A portfolio is a set of resource additions
  - For example, build a solar or combined cycle project; retire a unit; add more Energy Efficiency
- A sensitivity is an analysis where a key variable is changed
  - Provides insight on the impacts (value and risks) with changes in that variable

- The analysis will combine scenario and sensitivity analysis where we will test the portfolios across the range of scenarios which will measure the robustness and expose risks of the portfolios
- Each scenario needs to stand on its own, but a diverse group of scenarios is also important

Summary of Portfolios

Optimized Portfolios

1. Reference w/o CO_2 Regulation
2. Reference w/ CO_2 Regulation
3. High Gas Prices
4. Low Gas Prices

Hybrid Portfolios

5. Balanced Hybrid
6. Renewables/CC Hybrid
7. Renewables/CT Hybrid

Stakeholder Portfolios

8. Biden 100
9. Biden 90
10. Environmental Stakeholder Inspired
11. Reliable Energy
12. Deep Decarbonization/Rapid Electrification

Retirement Analysis

How will retirements be handled in the 2021 IRP?

- Retirements allowed starting with Planning Year 2023 due to required MISO Attachment Y timeline
  - The Attachment Y process is how a generator requests permission from MISO to retire generation

Three step process

- Resources run with retirement option turned off in order to get capacity factors for the duration of the planning window (Scenario dependent)
- Capital expenditures (Capex) and fixed operating and maintenance expense (FOM) for each plant is shaped over time matching capacity factors in first step
- Model run with retirements allowed starting with Planning Year 2023 using shaped capex and FOM in second step

What units are modeled for retirement?

- Cayuga 1&2, Gibson 1-5 and Edwardsport (multiple configurations)

Optimized Portfolios

Reference w/o CO_2 Reg Portfolio

Resources[1]

MW[2]

2200 MW of coal retires[3]

KEY TAKEAWAYS

2400 MW of coal runs entire term

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005															
Edwardsport IGCC	618	618																			
Edwardsport CC			541	541	541	541	541	541	541	541	541	541	541	541	541	541	541	541	541	541	541
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270
Gibson 3	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635
Gibson 4	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627
Gibson 5	313	313	313	313	313	313	313														
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310							
ZELFR																					
CC 1			815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815
CC 2 & 3							1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
Capacity PPAs	50	250	50																		
CT																					
EE	32	54	77	109	136	165	175	176	248	268	286	296	305	312	327	320	310	302	299	295	295
DR	497	507	512	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Solar	47	47	147	197	197	197	197	197	197	197	197	197	197	397	397	547	625	775	925	1,125	1,175
Solar & Storage																					
Wind (incl Benton)	100	100	100	100	100	100	100								50	100	100	100	100	100	100

Economics favor CC

Economics favor renewables in mid-2030s

Notes

1- Resource available for system

2- Nameplate MWs

3-Includes Gallagher 2&4

Reference w/ CO_2 Reg

2800 MW of coal retires including Gallagher 2&4

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005															
Edwardsport IGCC	618	618																			
Edwardsport CC			541	541	541	541	541	541	541	541	541	541	541	541	541	541	541	541	541	541	541
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	635	635	635	635											
Gibson 3	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635
Gibson 4	627	627	627	627	627	627															
Gibson 5	313	313	313	313	313	313															
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310							
ZELFR																					
CC 1							2,442	2,442	2,442	2,442	2,442	2,442	2,442	2,442	2,442	2,442	2,442	2,442	2,442	2,442	2,442
CC 2 & 3																					
Capacity PPAs	50	250	500																		
CT																					
EE	32	54	77	109	136	165	206	226	248	268	286	296	305	312	327	320	310	302	299	295	295
DR	497	507	512	533	538	538	538	538	538	538	538	538	538	538	538	538	538	538	538	538	538
Solar	47	47	347	747	747	747	747	747	747	1,147	1,547	1,947	2,347	2,747	2,947	3,147	3,325	3,525	3,725	3,925	4,125
Solar & Storage																					
Wind (incl Benton)	100	100	100	150	150	150	150	50	50	250	450	650	850	1,050	1,250	1,450	1,650	1,850	2,050	2,250	2,450

Economics favor CC

Carbon Tax accelerates renewable additions

High Gas Prices Portfolio

High Gas prices delay coal retirements

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005
Edwardsport IGCC	618	618	618																		
Edwardsport CC				541	541	541	541	541	541	541	541	541	541	541	541	541	541	541	541	541	541
Gibson 1&2	1,270	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005
Gibson 3	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635
Gibson 4	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627
Gibson 5	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310							
ZELFR																					
CC 1																					
CC 2 & 3																					
Capacity PPAs	50	250	500																		
CT				232	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232
EE	32	54	77	109	136	165	206	226	248	268	286	296	305	312	327	320	310	302	299	295	295
DR	497	507	512	607	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613
Solar	47	47	47	197	197	197	197	197	197	197	347	347	447	647	847	897	1,025	1,125	1,375	1,575	1,775
Solar & Storage																					
Wind (incl Benton)	100	100	300	500	500	500	500	400	400	400	400	400	500	700	900	1,100	1,300	1,500	1,700	1,900	2,000

High Gas prices don't favor CC economics

High Gas prices drive renewable energy additions

DUKE ENERGY

Low Gas Prices Portfolio

All coal retires

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005															
Edwardsport IGCC	618	618																			
Edwardsport CC			541	541	541	541	541	541	541	541	541	541	541	541	541	541	541	541	541	541	541
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270														
Gibson 3	635	635	635	635	635	635															
Gibson 4	627	627	627	627	627	627															
Gibson 5	313	313	313	313	313																
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310							
ZELFR																					
CC 1							2,442	3,663	3,663	3,663	3,663	3,663	3,663	3,663	4,884	4,884	4,884	4,884	4,884	4,884	4,884
CC 2 & 3																					
Capacity PPAs	50	250	450																		
CT			232	464	464	464	464	464	464	464	464	464	464	464	464	464	464	464	464	464	464
EE	32	54	77	109	136	165	175	176	172	167	160	150	139	126	113	95	74	57	44	31	21
DR	497	507	512	533	538	538	538	538	538	538	538	538	538	538	538	538	538	538	538	538	538
Solar	47	47	47	97	97	97	97	97	97	97	97	97	97	97	97	97	75	75	75	75	75
Solar & Storage																					
Wind (incl Benton)	100	100	100	100	100	100	100														

Low gas prices favor CC economics

Low gas prices don't favor renewables

Hybrid Portfolios

Blended Hybrid Portfolio

2200 MW of coal retires including Gallagher 2&4

2500 MW of coal runs entire term

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005															
Edwardsport IGCC	618	618	618	618	618	618	618	618	618	618	618	618	618	618	618	618	618	618	618	618	618
Edwardsport CC																					
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270
Gibson 3	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635
Gibson 4	627	627	627	627	627	627															
Gibson 5	313	313	313	313	313	313															
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310							
ZELFR																					
CC 1			815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815
CC 2 & 3							1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
Capacity PPAs	50	250																			
CT																					
EE	32	54	77	109	136	165	206	226	248	268	286	296	305	312	327	320	310	302	299	295	295
DR	497	507	512	533	538	538	538	538	538	538	538	538	538	538	538	538	538	538	538	538	538
Solar	47	47	247	472	472	472	472	472	472	672	800	925	1,050	1,275	1,300	1,400	1,450	1,550	1,650	1,775	1,825
Solar & Storage											75/20	150/40	225/60	300/80	375/100	450/120	525/140	600/160	675/180	750/200	825/220
Wind (incl Benton)	100	100	100	125	125	125	125	25	25	125	225	325	425	525	650	775	875	975	1,075	1,175	1,275

Additions of economic CCs

Significant additions of renewables

Renewables/CC Hybrid Portfolio

2200 MW of coal retires including Gallagher 2&4

All coal retired by 2035

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005															
Edwardsport IGCC	618	618	618	618	618	618	618	618	618	618	618	618	618	618							
Edwardsport CC															541	541	541	541	541	541	541
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270							
Gibson 3	635	635	635	635	635	635	635	635	635												
Gibson 4	627	627	627	627																	
Gibson 5	313	313	313	313																	
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310							
ZELFR															878	878	878	878	878	878	878
CC 1			815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815
CC 2 & 3							1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
Capacity PPAs	50	250																			
CT																					
EE	32	54	77	75	136	165	206	226	248	268	286	296	305	312	327	320	310	302	299	295	295
DR	497	507	512	601	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607
Solar	47	147	347	547	747	947	1,147	1,347	1,547	1,747	1,947	2,147	2,347	2,547	2,747	2,947	3,125	3,325	3,525	3,725	3,925
Solar & Storage											75/20	150/40	225/60	300/80	375/100	450/120	525/140	600/160	675/180	750/200	825/220
Wind (incl Benton)	100	100	200	300	400	500	600	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700	1,800	1,900
Storage			20	40	60	80	100	120	140	180	200	200	200	200	200	200	200	200	200	200	200

Additions of economic CCs

Significant additions of renewables

Renewables/CT Hybrid Portfolio

2200 MW of coal retires including Gallagher 2&4

All coal retired by 2035

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005															
Edwardsport IGCC	618	618	618	618	618	618	618	618	618	618	618	618	618	618							
Edwardsport CC															541	541	541	541	541	541	541
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270							
Gibson 3	635	635	635	635	635	635	635	635	635												
Gibson 4	627	627	627	627																	
Gibson 5	313	313	313	313																	
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310							
ZELFR															878	878	878	878	878	878	878
CC 1			815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815
CC 2 & 3																					
Capacity PPAs	50	250																			
CT							1,392	1,392	1,392	1,392	1,392	1,392	1,392	1,392	1,392	1,392	1,392	1,392	1,392	1,392	1,392
EE	32	54	77	75	136	165	206	226	248	268	286	296	305	312	327	320	310	302	299	295	295
DR	497	507	512	601	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607
Solar	47	147	347	547	747	947	1,147	1,347	1,547	1,747	1,947	2,147	2,347	2,547	2,747	2,947	3,125	3,325	3,525	3,725	3,925
Solar & Storage											75/20	150/40	225/60	300/80	375/100	450/120	525/140	600/160	675/180	750/200	825/220
Wind (incl Benton)	100	100	200	300	400	500	600	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700	1,800	1,900
Storage			20	40	60	80	100	120	140	180	200	200	200	200	200	200	200	200	200	200	200

CT replaces 2nd CC

Significant additions of renewables

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Stakeholder Portfolios

Biden Climate Plan Discussion

- Environmental Policy is a priority of the new administration
- Details on new regulation is still to be determined
- In keeping with the high-level goals that are being discussed, this scenario will be modeled as a mass cap reduction that gets the utility's CO_2 emissions to zero by 2035
- The IRP will model the Biden Climate Plan to determine what it would take for DEI to meet zero CO_2 emissions and still serve customers load Biden 100
- A second portfolio called Biden 90 will be evaluated that achieves 90% reduction by 2035

Biden 100 Portfolio

All coal and existing gas retired by 2035

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Cayuga 1&2	1,005	1,005	1,005	505	505	505															
Edwardsport IGCC	618	618	62																		
Edwardsport CC			541	541	541	541	541	541	541	541	541	541	541	541							
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	635	635	635											
Gibson 3	635	635	635	635	635	635	635	635													
Gibson 4	627	627	627	627	627	627															
Gibson 5	313	313	313																		
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310							
ZELFR													878	1,756	2,634	2,634	2,634	2,634	2,634	2,634	2,634
CC 1			815	815	815	815	815	815	815	815	815	815	815	815							
CC 2 & 3																					
Capacity PPAs	50	250																			
CT			696	696	696	696	696	696	696	696	696	1,392	1,392	1,392	696	928	928	928	928	928	928
EE	32	54	77	112	142	175	219	240	263	284	302	313	323	330	346	337	327	319	315	311	311
DR	497	507	512	607	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613
Solar	47	47	47	97	797	797	797	1,347	1,797	2,947	3,047	3,047	3,047	3,047	3,047	3,047	3,025	3,025	3,025	3,025	3,025
Solar & Storage											225/60	225/60	225/60	225/60	225/60	225/60	225/60	225/60	225/60	225/60	225/60
Wind (incl Benton)	100	100	100	100	100	100	850	1,200	1,850	2,300	2,850	2,850	2,850	2,850	2,850	2,850	2,850	2,850	2,850	2,850	2,850
Storage											650	800	950	950	1,500	1,500	1,650	1,650	1,650	1,700	1,700

Significant ZELFR additions

H2 burning CTs

Significant additions of renewables

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Biden 90 Portfolio

All coal retired by 2035

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Cayuga 1&2	1,005	1,005	1,005	505																	
Edwardsport IGCC	618	618																			
Edwardsport CC			541	541	541	541	541	541	541	541	541	541	541	541							
Gibson 1&2	1,270	1,270	1,270	635	635	635	635	635	635	635											
Gibson 3	635	635	635	635	635	635															
Gibson 4	627	627	627	627	627	627	627	627	627	627											
Gibson 5	313	313	313	313	313	313	313														
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310							
ZELFR													878	1,317	2,195	2,195	2,195	2,195	2,195	2,195	2,195
CC 1			815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815
CC 2 & 3																					
Capacity PPAs	50	250																			
CT			696	696	928	928	928	928	928	928	1,392	1,392	1,392	1,392	1,392	1,392	1,392	1,392	1,392	1,392	1,392
EE	32	54	77	112	142	175	219	240	263	284	302	313	323	330	346	337	327	319	315	311	311
DR	497	507	512	607	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613
Solar	47	47	97	97	447	447	547	847	1,447	2,647	2,897	3,047	3,047	3,047	3,047	3,047	3,025	3,025	3,025	3,025	3,025
Solar & Storage																	75/20	75/20	225/60	300/80	600/160
Wind (incl Benton)	100	100	100	100	100	100	500	1,100	1,750	1,900	2,400	2,550	2,550	2,550	2,550	2,550	2,550	2,550	2,550	2,600	2,700
Storage											100	750	750	850	850	1,000	1,200	1,300	1,300	1,300	1,300

Significant ZELFR additions

H2 burning CTs

Significant additions of renewables

Biden 90 portfolio keeps some gas operating based on economics and slightly reduces renewable build out compared to Biden 100

Environmental Stakeholder Inspired Portfolio

- Reflect priorities gleaned primarily from letters and discussions with Sierra Club
  - Gibson and Cayuga retire by 12/31/2030, sooner if economically advantageous.
  - Edwardsport on gas by 2023, and then runs to the end of the planning period on gas.
  - All new capacity through 12/31/2030 is clean, including solar, wind, batteries, solar/battery hybrids, DSM
  - No new gas before 2030 (includes CT and CC)

- Will be working with Sierra Club to ensure assumptions are accurate and will revise accordingly

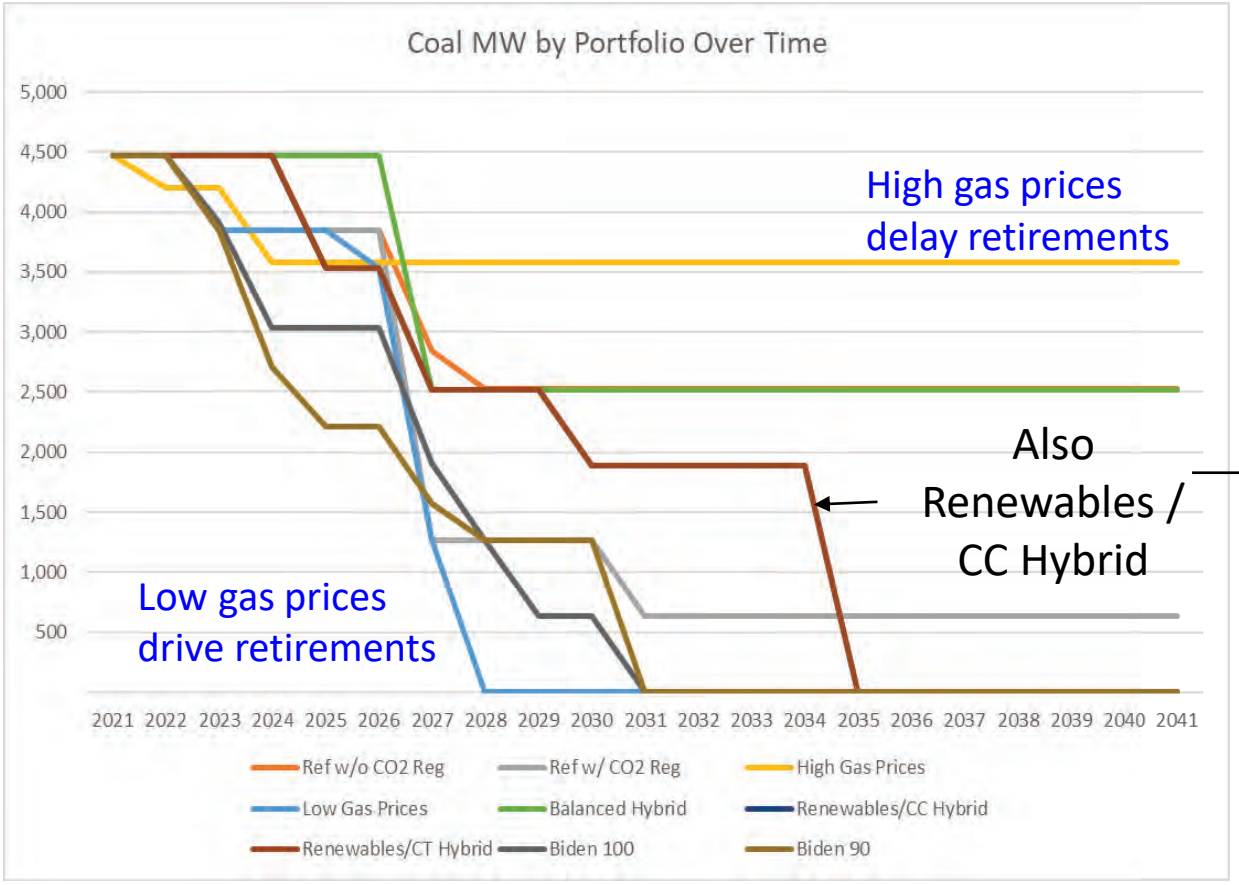
Reliable Energy Portfolio

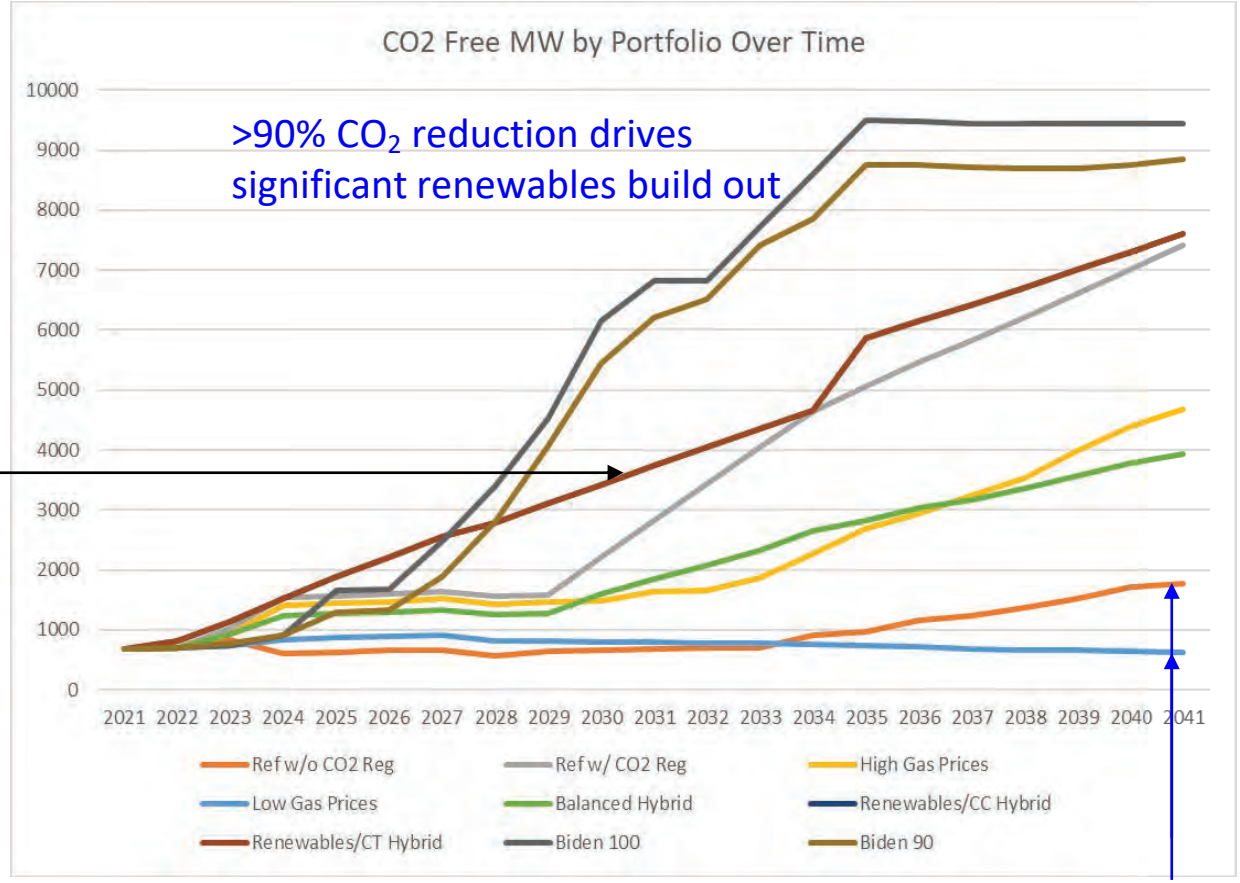
- Reliable Energy providing the following info re: its portfolio that we will use to develop a portfolio:
  - Mass cap of Net Zero CO_2 by 2040
  - 15-year life (for financial purposes) on CC's
  - CT's and firm/interruptible natural gas transportation contracts
  - Add Carbon Capture and Sequestration to Edwardsport by 2030 (in time to obtain access to Section 45Q tax credits) and assume financing is through securitization
  - Retire Cayuga early
  - Include upstream Green House Gases for coal and natural gas
  - High relative natural gas prices
  - High MISO Capacity Prices for transition period 2023 – 2030
  - Limit MISO renewables at current estimated costs to 35% through 2035.
  - Incorporate declining UCAP assumptions for renewables through forecast period.

- Focus on preserving options and showing the benefits of coal as the transition fuel to net zero

Lunch

Portfolio Summary Data (Coal & CO_2 Free Capacity)





Stakeholder Portfolio Modeling

- As has been done in the past two DEI IRPs, stakeholders can propose portfolios that reflect their preferences
- Some possible options are:
  1. Modify one of the portfolios presented in this stakeholder meeting
     - Use Portfolio Summary Statistics to screen portfolios that match your preferences
     - Adjust resource specifics presented in slides 9-20
  2. Provide energy mix by fuel/resource type every 5 years and we will develop a portfolio that approximates that mix
  3. Use the Portfolio Screening Tool in Chrome to develop resource mix
     - https://deiscreeningtool.duke-energy.com/
- Once specified (due Sept 20), a stakeholder portfolio will be evaluated alongside with the other portfolios

Analytical Framework & IRP Scorecard

Analytical Framework

PVRR, CO2, Market Purchases, Rate Impacts, etc.			SCENARIOS				SENSITIVITIES		
			Reference w/o CO2 Regulation	Reference w/ CO2 Regulation	High Gas Prices	Low Gas Prices	RFI Data	Extreme Weather	Others?
Optimized	1	Ref w/o CO2 Reg							
	2	Ref w/ CO2 Reg							
	3	High Gas Prices							
	4	Low Gas Prices							
Hybrid	5	Balanced Hybrid							
	6	Renewables/CC Hybrid							
	7	Renewables/CT Hybrid							
Stakeholder	8	Biden 100							
	9	Biden 90							
	10	Enviro SH Inspired							
	11	Reliable Energy							
	12	DDRE							

Allows for the comparison of how each portfolio performs across the range of scenarios

DEI Proposed Decision Criteria

		PORTFOLIOS											
		Optimized				Hybrid			Stakeholder				
		1	2	3	4	5	6	7	8	9	10	11	12
Scorecard/Criteria Factors		Ref w/o CO2 Reg	Ref w/ CO2 Reg	High Gas Prices	Low Gas Prices	Balanced Hybrid	Renewables /CC Hybrid	Renewables /CT Hybrid	Biden 100	Biden 90	Enviro SH Inspired	Reliable Energy	DDRE
Reliability	Dispatchability												
	Capacity and energy requirements												
	Reliance on market purchases												
Resilience / Stability	Diversity of Resources												
	Executable												
	Flexibility/Diversity												
Affordability	PVRR												
	Rate impact												
Environmental Sustainability	CO2 impact												
	Other environmental impacts												
Portfolio Flexibility	Ability to adapt to changing circumstances												

Timeline to Submission

Sept 10: Stakeholder meeting 5b (Portfolios)

Oct 6: Stakeholder meeting 6 (Modeling Results/Portfolio Metrics)

Oct 18: Stakeholder meeting 7 (Present Preferred Portfolio)

Nov 1: Submit IRP

Closing Comments, Stakeholder Comments

Wrap Up

- Meeting/Portfolio Survey
- Comments can also be sent to:
  - Scott at: scott.park@duke-energy.com
  - Stewart at: stewart@vanry.com
- Meeting summary and other materials will be posted on website by Sept 17
  - https://www.duke-energy.com/home/products/in-2021-irp-stakeholder

Resource Definitions

- Battery/Storage - Four (4) hour battery storage
- Capacity PPA (Capacity purchase power agreement) - Near term capacity needed to meet forecasted reserve margin requirements. Could be place holder for capacity only purchase, or purchases of power or existing assets coming out of request for proposals (RFP). Could be renewable or conventional.
- CC (Natural Gas Combined Cycle) - Options include Class F and Class J
- CT - Natural Gas Combustion Turbine
- CT H2 –Natural Gas Combustion Turbine using Hydrogen as fuel
- Edwardsport IGCC – Edwardsport with gasifiers running primarily on coal
- Edwardsport CC – Edwardsport with natural gas only operations
- Solar – Utility scale solar
- Solar + Storage - Solar plus 4-hour battery storage
- Wind – Utility scale wind
- DR– Demand Side Management Demand Response
- EE - Energy Efficiency
- ZELFR – Zero Emitting Load Following Resources. Placeholder for future technology of this type. Modeling using estimated nuclear small modular reactor (SMR) costs. Could be any future technology that is non-emitting such as Hydrogen CC, CC with CUS, SMR, Advanced Nuclear, etc.

Acronyms

AMI	Advanced Metering Infrastructure
CHP	Combined Heat & Power
CPP	Critical Peak Pricing
CS	Small Commercial
DR	Demand Response
DER	Distributed Energy Resource
DEI	Duke Energy Indiana
DSM	Demand Side Mgt (EE + DR)
EV	Electric Vehicles
EE	Energy Efficiency
EIA	Energy Information Administration
IURC	Indiana Utility Regulatory Commission
IRP	Integrated Resource Plan
LBNL	Lawrence Berkeley National Lab
LMI	Low-Medium Income
MW	Megawatt
NEM	Net Energy Metering
NDA	Non-disclosure agreement
PPA	Purchase Power Agreement
PVRR	Present Value of Revenue Requirements
RFI	Request for Information
RS	Residential Standard
RE	Residential Electric
TOU	Time of Use
TOUD	Time of Use with Demand
T&D	Transmission and Distribution
UCAP	Unforced Capacity
UPC	Usage per Customer
VPP	Variable Peak Pricing
VPPD	Variable Peak Pricing with Demand

#	Question / Comment	Asker Name	Response Type	Answer(s)
1	Why was a link to register for this meeting not posted to DEI's website? The slides are also not available on DEI's website to download.	Caleb Loveman	Written	They were supposed to be posted yesterday. Apologies for the delay. We will check on that.
2	What's the decision process after stakeholder feedback has been collected?	Kara Archer	Written	We will address that this afternoon. We have a list of criteria to discuss that will help the Company make an ultimate decision on what the preferred portfolio will be.
3	Several of us with Sierra Club had difficulty finding the link as it was not included in the email with the slides and isn't on the website, so we missed Stewart's message, if that is important.	Devi Glick	Written	Sorry about that. All Stewart covered was the ability to ask questions, etc.
4	Also I am not Devi Glick. I am Wendy Bredhold, so I must be using her link.	Devi Glick	Written	I think there is a function where you can rename your self.
5	perhaps a price on carbon would simplify the modeling when compared to mass cap limits.	Jim Grimes	Written	yes, that's correct. Other scenarios do use a price on carbon and that's how we have traditionally done it.
6	Duke is Indiana's largest single source of carbon emissions. Climate change affects the future for ALL our kids and grandkids. Will the associated carbon emissions be included with the analysis of portfolios? Will carbon emissions date be provided today?	Leslie Webb	Written	We understand. Total carbon emissions and the other attributes of the portfolios will be covered in the next meeting. There is more modeling to be done to obtain that data. Today, we will be reviewing just the list of resources in each portfolio.
6.1	Thanks, Kelly. So how do you expect stakeholders to provide feedback on your survey today without carbon emissions data?		Written	I did not see the follow up question from Leslie. We will show in later slides the total coal MW and the total CO_2 Free MW, but the data you are asking for is not available yet.
6.2	I don't see Kelly's initial response to Leslie here.		Written	see next question
7	Hi Stewart, Participants may have a different view. I'm not seeing any of the tabs you are describing in Q&A. Also, it does not have the dots you described in the upper left. - Indra	Indra Frank	Written	Peter is looking into this Indra. I am not sure why that is the case. We will find out and fix this as quickly as possible. Hi Indra, Mike and others, we are working on this in the background - not sure why you cannot see answers
8	Stewart, the Chat is disabled! Will it be turned on?	Laura Arnold	Written	Chat is not available. You can communicate with, we are using the Q&A dialogue to enable stakeholders to engage with each other and with us.
9	what efforts have you made to engage a diverse range of stakeholders?	Kara Archer	Written	We have conducted both the day long and evening sessions. The evening sessions have been geared toward customers that are not experts in the IRP process to bring more awareness to our customer base.
10	Ok, thanks Kelley. Was there any intentional outreach to make sure the stakeholder group fairly represents all people who will be impacted by Duke's future decisions?	Kara Archer	Written	Other than the stakeholder meetings, DEI has discussed IRP issues with groups that have expressed interest, as well. We marketed the evening meetings to our customer base via email.
11	Stewart - I am having the same experience as Indra is -- I do not yet see a response to her comment.	Michael Mullett	Written	Peter is looking into this as we speak.
12	Just a reminder, the smallest price on carbon in legislation that has already been introduced in Congress is $15/ton, increasing by $10 each year.	Jim Grimes	Written	Thank you. We believe the other more strict portfolios Biden 100 /90, etc. have the ground covered.
13	What are the actual high and low costs of gas vs present price of gas	Ray and	Live Answered	I will have to look at the specifics over lunch, but generally we are seeing about $4.00 at as the low at the end of the planning period and $7.00 at the end.
13.1	So, you will check on this over lunch.		Written	Yes
14	Who is EMCC?	Megan Anderson	Written	Energy Matters coalition, Mike Mullet
14.1	Thanks if we can avoid acronyms that would be appreciated :)		Written	Energy Matters Community Coalition, the proponent of the DDRE Scenario.

#	Question / Comment	Asker Name	Response Type	Answer(s)
15	How will you handle portfolios that have asusmptions of technologies not yet commercially viable?	sean brady	Written	We do include as a resource placeholder we call a ZELFR - zero emitting load following resources - it's a place holder for things like SMR (small nuclear), advanced nuclear, combustion turbines with hydrogen or carbon capture, long duration storage, etc.. The models can select these resources in the out years, assuming there have been technology advancements.
16	Wasn't Cayuga announced in 2020?	Wendy Bredhold	Written	Cayuga's current retirement date is estimated at 2028 and that was included in our prior IRP (2018).
17	Can you explain again why an RFP was not initiated earlier in this IRP process? And when will you issue the RFP?	Leslie Webb	Written	We plan to issue the RFP at the end of the process so that we know what amount of renewables, and other resources we have a need for. The world is changing fast and we could not rely on our last IRP to determine the near-term needs - i.e., how many MW and when. The plan is to do an RFP in early 2022.
18	Does the Company believe the recent increase in Henry Hub prices are a short term phenomenon and prices will smooth out over time? Or does the Company believe prices may continue to be violatitle and potentially increase in the long term?	Kerwin Olson	Live Answered	What we have seen is that the recent runup of prices has been more of a front end phenomenon. Certainly the backend of the curve has not moved nearly as much and is still within the confines of the high and low gas cases that we are considering. But it does highlight where prefracing gas was extremely volatile, but what we have seen is, with fracing, not only have gas prices gone down, but the volatility has gone down as well. We are starting to see the E&P companies doing things to improve their balance sheet and make sure they are on stronger footing. We have also seen the the rise of natural gas exports. When these factors come together we see prices rise. However this seems to be a short term phenomenon, rather than a systemic change. It does illustrate we can't take too much for granted. This points to why we want to consider different trajectories of gas prices in teh analysis.
18.1	So this is uniform across all analysis?		Written	Yes - we will want to portolios that can handle volatility without getting too bent out of shape.
19	Refer to Slide 7 unit retirements. Did DEI evaluate any of these legacy coal-fired power plant units for possible gas-fired conversion?	ANTHONY ALVAREZ	Written	Anthony - we did not include any gas conversions other than Edwardsport in the modeling.
19.1	Is there any particular reason for not including any gas conversion evaluation of the legacy power plant units?		Live Answered	See response to number 33.
20	The Reference without CO_2 Regulation portfolio is showing a drop in Demand Response (DR) from 512 MW in 2023 to 200 MW in 2024 and this seems to be different from the other portfolio tables. What is causing this drop in DR capacity?	Chelsea Hotaling	Live Answered	Its very simply the economics. DR does provide a number benefits, but this reference case without carbon, different resources need to compete for themselves. Demand response has capacity value but it doesn't have energy value. The economics favor combined cycles without a carbon tax because the not only provdie capacity value but also energy value. To minimize costs that resource is preferred.
21	Do the portfolios take into consideration the work underway at MISO on Seasonal Resource Adeqacy Construct? MISO plans to make a filing at FERC on this proposal yet this Fall.	sean brady	Written	We will be looking at both a summer and winter peak for reserve margins. However, the new proposal was not (and still is not) specified enough for us to completely include it. We will consider it, but are not able to model it.
21.1	Kelley, the proposed construct is actually four seasons, not two, so I think it's pretty important to capture that if you are going to attempt to represent the construct. Are you doing any runs without a seasonal construct given the uncertainty about what it would look like?		Written	Hi Anna - I think Scott covered this. We are using current construct, but still looking at when we may become winter peaking.

#	Question / Comment	Asker Name	Response Type	Answer(s)
22	Can you explain the difference between Edwardport IGCC and CC?	Leslie Webb	Live Answered	Edwardsport is a gasified coal facility where it brings in coal and puts it through a fairly complicated chemical process that strips away a number of pollutants and then creates something called syngas. That syngas goes into a turbine and is burned similar to natural gas, and then steam from the syngas process goes into a steam turbine that then uses electricity. That is a description of the Edwardsport IGCC. We have 600 megawatts coming out of that resource. In this portfolio this switches to a combined cycle in 2023 where the gasified coal process stops and we just send natural gas to the turbine, which gets burned and creates steam for the steam turbine to make electricity. There is a change in operation - the plant remains but it goes from a coal fired unit to to a gas burning unit. CC means Edwardsport running on gas and IGCC means running on coal.
22.1	Thanks, so it's switching from coal to gas		N/A	
23	Does Duke believe the MISO Attachment Y process is required to run Edwardsport solely on natural gas? In other words, is it possible to make the conversion to natural gas for 2022?	Aaron Schmoll	Written	I don't believe Attach Y is necessary, but the capacity value does change, so we would need to synch up with MISO planning year, etc. Also, we believe any major change in operations (like permanently discontinuing coal) will need a regualtory process. As such, we estimated that June 2023 would be the first MISO planning year where the change can be made. It's just a simplifying assumption at this point.
24	Can you explain why customer-owned solar is not considered a type of Demand Response since it basically helps to off-set demand?	Leslie Webb	Live Answered	(Stewart Ramsay) It shows up similar but because you are not controlling it you are just mapping when that customer's solar is showing up and reducing the customers load. But because you don't dispatch it like you do DR you don't have in the DR category, but it is having the effect that Leslie is pointing to, it is reducing off-set customer demand at hte time it is available. Correct? (Scott) Absolutely
25	Thanks. Also, what is the assumed annual operations and maintenance expense for Edwardsport as a combined cycle facility?	Aaron Schmoll	Written	Let me take that one back. We have a couple of different assumptions based on different operating assumptions.
26	Yes, I have on above.	ANTHONY ALVAREZ	Written	Anthony - just confirming I didn't miss a question. Are you good now? Kelley - No. I had a follow up question (comment) after your response.
27	Why do economics favor CC?Is there something in the modeling to favor CC? Do your models have an inherent bias toward gas?	Leslie Webb	Live Answered	The economics for CC are that it is relatively inexpensive to build from a capital cost, and operationally, since it burns gas in the J-Class combined cycles are very efficient so it has low production costs. That drives the economics as well as the flexibility (ease of start and shut down) that allows it to take advantage of rises and falls in gas prices. That is the value proposition of Combined Cycle.
28	Were solar and wind ppa's modeled for the entire duration of the study period? The optimization algorithm in EnCompas will not build Solar and Wind that is programed in as utility owned projects if there is no capacity need even if the energy is cheaper from wind and solar.	Devi Glick	Live Answered	If we see portfolios that start building essentially energy to sell into the market, this is a red flag, we generally don't like to see that. The solar here is costed out at the MISO level and the portfolio level assuming a tax equity structure, which does show a reduction in cost over traditional utility ratemaking. At this stage we are identifying need, and this, again, is in one particular portfolio. Other portfolios will have much more, in this case, solar being selected. In the execution phase we will issue the RFP and we will get responses that are transactable and do another valuation - new load forecasts etc - and make the economic determination of what to execute and go forward with. In this case, given the lack of a carbon tax the continued operation of the coal units, there isnt the need and the economics dont support much renewable additons until the 30's
29	There is a reference to Gallagher 2&4 on the Ref w/o CO_2 slide. I thought Gallagher retired in June of this year. Would it be brought back online?	Indra Frank	Written	It is retired and is not intended to be brought back on line
29.1	Thank you, Kelley. Why is it mentioned on the slide?		Written	I think Scott covered, but it was only included because it operated part of 2021.

#	Question / Comment	Asker Name	Response Type	Answer(s)
30	If you summed the columns, would the yearly MW totals be roughly the same for each portfolio?	Barry Kastner	Live Answered	Generally no, because not all units of capacity are the same. When it comes to modelling we use the UCAP convention that MISO currently uses. This takes the nameplate capacity or ICAP and adjust it based on its forced outage rate. A 100 megawatt coal unit might be, for example, 88 or 90 megawatts in that world. A combined cycle might be 97 megawatts. A 100 megawatt solar facility would only get you 50 megawatts and 100 megawatts of wind might only get you 12 or 13 megawatts. It would be like adding apples and oranges since each portfolio has different amounts of different types of generation. We are mindful of the reserve margin and energy sufficiency that is also important to consider. So the answer is, they would not add up to the same thing.
31	Duke needs to postpone submission to give stakeholders with experts the opportunity to review the modeling and collaborate with us.	Jennifer Washburn	Written	At this point we are still on track to make the Nov. 1 filing and we really don't want to delay because we need to get it final so we can issue the RFP for any near term needs. We will work with you on data once it becomes available and go from there.
31.1	Kelley, does that mean transmission of these modeling files to intervenors is imminent? Stewart, please read our request for Duke to delay submission.		Written	If we don't have enough time and collaboration for this part of the process, what is this all for? This is the most important stage of the IRP COLLABORATIVE process. We are supposed to work out any disagreements beforehand and dig into the data together. We hope Duke reconsiders.
32	Refer to Slide 7 unit retirements.	ANTHONY ALVAREZ	Live Answered	(See next)
33	Did DEI evaluate any of these legacy coal-fired power units for possible gas-fired conversion? If no, is there any particular reason for not including any gas conversion evaluation of the legacy power plant units?	ANTHONY ALVAREZ	Live Answered	In this analysis we haven't. We have essentially screened out that technology. Typically we find that when a coal unit gets converted to burning natural gas there is still a fairly high forced outage rate. You find yourself with the cost of converting the unit, it burns a more expensive fuel, and the outage rate is still relatively high compared to a combined cycle. It just doesn't run that much given those higher costs. All of this undermines the economics of converting coal to gas. Again I am speaking of traditional pulverized coal generators like Cayuga and Gibson, that have a large boiler. Edwardsport is a completely different type of coal burning facilitiy.
34	Scott, do you know if the winter or summer PRM has been binding in your analysis so far?	Anna Sommer	Live Answered	Planning Reserve Margin - yes - we are mindful of both the winter and the summer reserve margins.
35	That's one reason why I think it's really important to model 4 seasons and not two seasons as you are doing. I also think it's important to model the current construct because of the uncertainty you are mentioning	Anna Sommer	Written	The new MISO construct is constantly changing with each MISO meeting. There is simply no way for us to model it because it has not been finalized. And frankly has changed drastically since it was first introduced.
35.1	I totally agree Kelley, which is why you should model the current construct too.		Written	Just following up, but we are modeling the currrent construct. Sorry, I misunderstood your first question.
36	Stewart - The features you just described, I am seeing; it was the original description you provided earlier that I was (and still am) not seeing.	Michael Mullett	Written	Do you have a question
37	I	Wendy Bredhold	N/A	
38	Thank you for looking into the Q&A box question, Stewart. When I open the Q&A box, I can see the questions and answers, I just wanted to let you know that the box does not have the tabs you mentioned during the intro. The only tabs available are "all questions" and "my questions"	Indra Frank	Written	OK. Thanks. The names are different then. I apologize
39	This claim that renewables aren't economic until mid-2030s is laughable. Even amongst Indiana IOU's alone that is clearly not true.	Wendy Bredhold	Written	It depends on which scenario you are in. Recall that this is a scenario without CO_2 regulations. You will see more renewables in the other scenarios and portfolios.
39.1	Kelley, we don't have CO_2 regs now and renewables are competitive with gas.		N/A	
40	Why is Gallagher on the slide?	Indra Frank	Live Answered	It was retired in 2021 - It would just add one more level of detail

#	Question / Comment	Asker Name	Response Type	Answer(s)
41	Sorry, I don't totally follow that Scott, so you are using the same reserve margin requirement for both winter and summer?	Anna Sommer	Live Answered	Effectively yes, in the absence of having a specified winter reserve margin
42	What is the assumptions regarding CC plant life?	Emily Medine	Written	In these runs I believe we are using full life assmptions (30 or 35 years).
43	What is about Gibson 3 which makes it the Gibson unit which stays on the system the longest?	Michael Mullett	Live Answered	It is going to be small changes in heat rate, or variable costs of O&M might be different than other units. If the optimization can save a dollar, it will move heaven and earth to save a dollar. It s the calculation that would keep one of these units on, the difference betwen any of these units is probably very small.
43.1	Is Scott's answer regarding marginal modeling differences with the other Gibson units the same reason that Gibson 3 has been the unit used in the Company's CO_2 capture studies in collaboration with China and the Lawrence Livermore National Lab?		Follow-up	No, the reason the Company modeled Gibson U3 in the referenced CO_2 capture studies was because Unit 3 has been studied previously in evaluating past carbon capture technologies. Additionally, this unit would have the most design complexities due to its location in the middle of the plant.
44	What assumptions are being made regarding new gas pipeline permitting?	Emily Medine	Live Answered	There is still sufficient pipeline capacity to support a couple of additional CCs. So this is not a limiting factor in this analysis. When it comes time for the CPCM Process a couple of those other qualitative analyes would be required. If we wanted to bring in a Combined Cycle and there is a pipeline close by, this is not an issue. However, if we want to locate and we DO need a new pipeline, that is a very complex analysis. As far as identifiying these portfolios there was not a limitation driven by an assumption about no new pipeline capacity being available.
44.1	Stewart Ramsay - In this case we are seeing a lot more reliance on renewables as compared to the previous case, where the economics did not appear to favor renewables out until 2030's. The previous case without a carbon tax and whatever the assumptions are on gas price brings up one of the questions asked and answered offline was about "why not". Renewables are cost effective. Why under the previous scenario does it have to do with capacity credit that renewables get. What is it that creates such a big shift here with and without CO_2 regulation that makes renewables much more economic?		Live Answered	This is where it gets into complexity. Let's say with solar technology that it costs $1 a megawatt hour - its cheaper than ever, and that's a fully loaded cost. If you look at the per unit cost, you might say well, just build nothing else. The problem is that on a megawatt hour basis is that you don't have any power when the sun doesn't shine. So when it comes to planning, looking at things on a dollar per megawatt basis becuase we need to be able to serve customers reliably, all years and all hours. All of these factor, no matter what the resource is, we are looking at what the capacity is at the time of the system peak. If the system peak doesn't coincide with the solar peak or the wind peak, there will be a divergence. So if I need a 100 megawatts of wind and the credit is 12 megawatts per hundred, I need to invest in that much more wind capacity to insure that I have 100 megawatts at the time of the system peak. For planning purposes we need to make sure we are serving the peak, but even this is somewhat simplistic, because we need to be able to serve energy for all 8760 hours. This, is an added reality of resource planning and resource adequacy. When we get to seasonal construct it gets even more complicated because different resources contribute different amounts to different peaks. So in summer when solar is doing well in the afternoon it does a great job of serving the peak. If you get a cold winter day at 8 am you have loads peakiing solar is not doing much. Wind actually performs better in the winter than the summer. All of this needs to be considered and drives the overall economics. It more complicated than a pure $ per megawatt per hour comparison.
45	Just to be entirely clear, you are still using the carbon tax of starting at $5/ton + $5/year despite that being lower than any proposed federal policies, correct?	Alex Jorck	Written	In the reference cases, yes.
46	Do the renewable additions reflect declining UCAP?	Emily Medine	Written	In this view, it is just name plate capacity.
47	What's the difference between CC 1 and CC 2&3 and why the difference in the type of CC that was selected between the CO_2 price and no CO_2 price portfolio?	Will Kenworthy	Live Answered	In this scenario they are more sequential. We are seeing the progression of different technologies -F class to J Class in one Scenario and
48	It looks like the models are based on anticipated MW output of various energy sources. But is cost of maintaining renewables similar to cost of nonrenewables?	Kara Archer	Written	The costs of different mainteance for different resources is included in the model.
48.1	Are there supplementary materials that clarify how actual dollar costs for each energy source factor into the key points about where economics favor specific sources?		Written	We have data behind the modeling which can provide - some is confidential and requires an NDA. Please get with me and Scott after today's meeting to discuss.

#	Question / Comment	Asker Name	Response Type	Answer(s)
49	Nobody is saying that.	Wendy Bredhold	Written	I'm sorry Wendy, due to the delay in posting questions and the discussion, I'm not sure what this is refering to. All I see is "Nobody is saying that".
50	What assumptions are you making about the economics of storage and how it might enhance to UCAP of grid connected solar? What was your source for those assumptions?	John Jones	Live Answered	Storage in an RTO is challenging because the market acts as a kind of a battery. You can inject in one hours LMP and discharge in another hours LMP. To some extent that undermines the value of storage. Depending on how MISO's construct changes that could definitely boost the value proposition for storage. Storage in general is a resource that provides many more benefits than just what a generator does. It can provide capacity and it can provide energy, but it can also act as an alternative to transmission and distribution. It can provide different grid support services. When I look at this as simply pure optimizaion which minimizes cost, generally speaking storage does not show up. When we look at some of the other portfolios we do add storage because it does provide additional benefits that optimization does not capture. In terms of the source information, we gather that as part of the cost collecting information. We contract with various industry experts to get that information. In the RFP we will be asking for battery proposals as well. and using those prices in the analysis going forward.
51	What is the storage duration which is being assumed over the 20-year horizon for the IRP? Does it increase, if so, at what increments in what years? Is storage duration improvement also modeled with Solar DG + Storage in terms of forecasted load reductions?	Michael Mullett	Live Answered	Storage duration - We use the 4 hour as a the primary. We do allow for a 2 hour as well as a longer duration battery to be an option but, as you see, they are not being selected. When we get to actually executing we will have to look at a number of factors to decide what is the best type of battery. Today we have a traditional shape of load where it bottoms out over night and it ramps up in the afternoon. A traditional summer profile. As more solar comes on line, EV charging comes to be, additional home heating comes in. that shape could change considerably. Its that shape the battery takes advantage of. It allows us to buy at the low load, low price times and sell at the high priced. We could be in a situation where the load shape is considerably different and as that shape evolves that is going to dictate different duration of batteries and that sophistication is not in the model.
51.1	Stewart Ramsay - Are you making an assumptions of Solar plus storage on the customer side in terms of forecasted load reductions.		Live Answered	There is not Solar Plus Storage in any of our forecasts. We have not seen that show up in a material way.
52	But, given the conversation earlier with Stewart, solar + storage would have a higher capacity factor than solar alone @ MISO -- and that would show up in the IRP modeling, right?	Michael Mullett	Live Answered	Not necessarily. It does become a better asset, in this particular case you would now have winter capacity value, but it comes with additional costs. The economics and benefits are factored in. In this modeling space the economics of storage and solar are not favorable. As we go forward we will see portfolios that do include solar and storage because there are additional benefits of storage as well as paired solar and storage that we do think is important in terms of the direction the utility needs to be going,
53	Can you explain how much EV adoption is being modeled? I think Kelly mentioned that some EV is included in your modeling, but not sure details of how much have been shared.	Leslie Webb	Live Answered	I will get that at lunch. However in general, customer owned solar lowers the load forecast and customer owned EVs increases the forecast. So both of these are not dispatchable or controllable by the utility they just effect, and to some extent, offset each other.
54	But, this is where the CO_2 mass cap comes in -- solar + storage at even a higher cost will satisfy the mass cap "must" constraint when the solar alone would not. . . .	Michael Mullett	Live Answered	I completely agree. We will get to these, but if we make these assumptions, this does not include a carbon tax, its does not include mass cap, and this is the lowest cost set of options. When we get into some of the hybrids, as well as the Biden plans, then storage is an important part of that.
55	It is Mother Nature not the Biden Administration which imposes the CO_2 mass cap. Thus, Mother Nature's mass cap should be in ALL scenarios -- whether DEI has figured out how to model it or not!!	Michael Mullett	Written	I understand your point of view. We want to have a diverse set of scenarios (futures) and portfolios to assist in decision making.
56	In low gas prices, if the company says "all coal retires" by 2028, does that mean Edwardpsort will run on only gas, and not syn gas, after 2028?	Kerwin Olson	Written	Yes. Looks like it switches to gas operations (denoted as Edwardsport CC) in 2023.

#	Question / Comment	Asker Name	Response Type	Answer(s)
56.1	If so, why is all the capacity IGCC and CC? sorry, "not" cc? I might be looking at the wrong slide.		Written	OK. When it changes from IGCC to CC, that's the year it moves to running on gas.
57	It concerns me much of these models assume coal burning past 2030, I think it isn't a good planning strategy given the economics. When you say preserve does this mean the model didn't choose to continue coal burning but Duke did?	Megan Anderson	Written	In the optimized portfolio runs we have reviewed, the model chose the results based on economics. In the Hybrid and Stakeholder portfolios, Duke Energy or Stakeholders create the portfolio.
58	What constraints did you impose on the optimization for this portfolio?	Anna Sommer	Live Answered	(reference to Blended Hybrid) This was not constrained or optimized. We took the lessons learned from the previous model and moved the pieces around to come up with a portfolio that got the diversity and balance I spoke about.
59	Indeed i was, apologies	Kerwin Olson	N/A	
60	We don't have that much time to keep burning coal.	Wendy Bredhold	Written	Thanks for your input. We are looking at a variety of portfolios with different transition timelines.
61	Good morning! In the renewables/CC hybrid portfolio (slide 15), what explains Edwardsport operating as a coal-fired IGCC until 2035?	Simon Lomax	Live Answered	That is just a selection of this portfolio. It is blending it and is a little more progressive in the transition phase.
62	But why is it continuing to run - as in economically what did you learn that justified it continuing to run?	Megan Anderson	Live Answered	I look back even on the previous portfolio - where it still continues to operate as a coal unit for the duration. Edwardsport is the cleanest of the coal operations, because in the gasification most pollutants get stripped out early. There is the additional option that down the road the IGCC could have carbon capture technology added to it. Its just a choice that this portfolio includes.
62.1	So is it cheaper to run edwardsport on coal until 2035 versus gas in this porfolio?		Follow-up	In the hybrid and stakeholder portfolios, resources are placed in certain years, rather than purely optimized by the model.
63	I can't imagine there is anyone here who isn't being personally impacted by climate change at this point. We do know what future is in front of us if we don't retire coal. Again, please delay your submission. We need the modeling files. We need time to collaborate with you and dig into the files. Otherwise, Duke is going against the spirit of the IRP collaborative process and this has all been for naught.	Wendy Bredhold	Written	As stated, these portfolios are options to consider and compare on various criteria like reliability, diversity, costs, etc. The timing of coal retirements will be different in various portfolios.
64	How do financial implications for Duke and for customers differ for this model compared with the more coal and natural gas based models you showed earlier?	Kara Archer	Written	We will be looking at the revenue requirement and rate impact in the next meeting after the modeling is completed. It's a major consideration in determining which is the preferred portfolio.
65	When are the modeling files underlying the Company's analysis going to be made available to the Stakeholders who have requested them and executed the NDAs necessary to obtain them?	Michael Mullett	Written	I don't have an exact date at this point. Let me take that back.
66	Scott, you have directed our focus to 2041, but protecting our KIDS AND GRANDKIDS from climate change requires urgent, immediate action and hinges on what happens in the next decade. Can you briefly review your portfolios focusing on the SHORT TERM.	Leslie Webb	Live Answered	Yes - we can certainly do this. The IRP has the plan and the short term action plan. I will do that
67	On the hybrid portfolios, please explain why the Edwardsport does not convert to a combined cycle (or has a later date of conversion) than indicated in all of the optimized portfolios.	Aaron Schmoll	Written	The hybrid portfolios offer a different version of the future. They will be compared to the other portfolios on all the criteria like relaiblity, diversity, costs, etc. We believe there are diversity and fuel security benefits to maintaining Edwardsport on coal for longer durations. We want to see a variety of portfolios to compare.

#	Question / Comment	Asker Name	Response Type	Answer(s)
68	Echoing Jen's comment from earlier - this modeling is very complicated, as evidenced by the delays the Company has already faced. If Duke is genuine about taking stakeholder comments and feedback into account in its modeling, the Company needs to provide a timeline sufficient for stakeholders to review inputs, assumptions and results and provide that feedback. And then time for the Company to actually incorporate that feedback into its modeling. Finalizing results on the current timeline will not allow sufficient time for that.	Devi Glick	Written	Let us take this discussion back and discuss the potential timing we see. More to come.
69	One of costs of burning coal is disposing of the combustion wastes (coal ash). We've seen in the Carolinas that environmentally protective coal ash disposal costs are considerable. Under federal regulations, on top of the disposal costs, coal ash disposal sites are also responsible for groundwater monitoring and treatment of contamination that extend for 30 years after the site stops receiving coal ash. I assume the coal ash costs are somehow worked into the retirement analysis, but it would be helpful to hear an explanation of how the costs associated with coal ash disposal and 30-year responsibilities are treated in these portfolios?	Indra Frank	Live Answered	I will defer on this to someone else on the team. We will get an answer out on this as soon as possible. Email response provided to Indra Frank: Thank for your question at the IRP stakeholder meeting concerning whether the costs associated with coal ash basin closure are included in modeling. The costs included for coal plants do include the incremental costs associated with future coal ash closure and monitoring costs consistent with the requirements of the USEPA's Coal Combustion Residual (CCR) Rule. For example, assume a coal unit's continued operation would require a new landfill cell to open up and adds additional acreage to the landfill footprint. In that case, the incremental costs of the landfill and 30 year monitoring of ground water for the new acreage are included as cost required to continue to operate that coal unit. In contrast, sunk costs that are already required today under the CCR rule to close current ash basins are not included in modeling, as such costs are required no matter when the coal unit is retired. This would be true for all the portfolios.
69.1	Thank you for reading this question! I look forward to the discussion after lunch		N/A	
70	Again, please delay submission. We don't have the modeling files yet. We need time to collaborate with you. Or is it's Duke intention to not collaborate and work on the most important part of this process, ie the actual modeling files?	Jennifer Washburn	Written	You will get access to the files when they are completed. Let me check on timing of that.
71	In the future would it be possible to show the tons of CO_2 emitted for each year so we could see how it is or isn't goinng down and by how much. And ofcourse it woud be interestng to see the cost of the electric in each year.	Ray and	Written	Yes - this will be part of the next meeting. Each portfolio will behave a little bit differently in terms of carbon emissions depending upon the scenario it is in - We will have hard data for next meetings.
72	Can you discuss how the IRP modeling process deals with renewables that can be contracted on an energy-only basis at lower prices than the go forward costs of coal and CCGT (particularly in high gas and carbon pricing scenarios)?	John Jones	Live Answered	We look at a comprehensive resource so we don't get into where a resource can be stripped apart in terms of its capacity only value, energy only value, rec value, that sort of thing. They are considered together for each kind of resource. When we get into the RFP process if a bidder wants to provide a bid that is an energy only product, and it does reflect a lower cost because of that, that is something we would consider as part of the RFP analysis.
73	Short term?	Leslie Webb	Live Answered	If we define short term as through 26 - we are retiring a Cayuda and a couple of Gibson units and starting to really ramp up solar and wind. The primary objective of this portfolio is to meet the 35 target.
74	I assume it is green hydrogen. How is it priced?	Emily Medine	Live Answered	Yes - it's a green hydrogen product so we've taken some near term cost forecasts as well as some technological innovation assumptions to develop that. Having said that they are not high capacity factor machines. They are not going to run that much and so the impact on the assumed hydrogen price is not that great.
75	It seems very odd to me, that even under these constraints solar + storage aren't being added until the 2030s. That strikes me as a reason to revisit pricing, operating charateristics, etc. As we've said before we think Duke's pricing for these assets is overstated.	Anna Sommer	Live Answered	That is certainly something we can look at.

#	Question / Comment	Asker Name	Response Type	Answer(s)
76	1. Does DEI make any asusmptions about reusing transmission/interconnection rights to add renewables at existing generation sites?	sean brady	Live Answered	Generally speaking we don't get into that siting part of the conversation. As a practicality that is something we would certainly consider. Looking at other portfolios, if we had the opportunity we would certainly make use of exising sites and this is something we would do for all resource additions. To the extent there are synergies to be had with retirements or additions that make use of existing sites - and we would do that with both conventional and renewable resources.
77	Even with the Biden 90, why does there have to be a delay in coal burning plants retirement when the focus is to keep the gas for high peak times. I don't see why the delay in coal retirement.	Cheryl Gettelfinger	Live Answered	There are economics in running coal and we want to do what is economic for the benefit of customers. Again, this speaks to the modelling process. We ask the model to "meet this". If we wanted it to get lower earlier, we would install that as a requirement. We would be more than happy to work with stakeholder proposed portfolios that have that faster CO_2 reduction as its premise.
78	Thanks Scott - we will probably have some additional specifications around modeling solar and wind as energy resource (PPAs)	Devi Glick	N/A	
79	I don't see any RFPs referenced on the website. Where should we go for more info?	John Jones	Written	We are working on the process now, there is nothing to review at this point. When we have a draft, we will send for review/ post it. Likely not until after we file the IRP.
80	2. For implementation of additional renewables, what barriers does DEI see to being able to site the level of renewables needed? Clean Grid Alliance (CGA) would like to discuss with DEI what's needed to implement the additions in the portfolios and siting challenges. We realize it's an implementation detail, but DEI can't achieve it's portfolio if renewables are not available because of siting challenges. Please contact CGA to discuss. Sean Brady sbrady@cleangridalliance.org	sean brady	Written	Thanks, Sean. We will reach out to discuss offline.
81	Thank you, and just to clarify, Duke reached out and asked us to participate in this exercise.	Wendy Bredhold	Written	Thank for the clarification Wendy
82	Who is Reliable Energy? Is it a coal advocacy group?	Leslie Webb	Written	They represent coal interests.
83	What is "Reliable Power"?	Megan Anderson	Written	Reliable Energy**
84	Who is Reliable Energy? Is it a coal advocacy group?	Leslie Webb	Written	Yes.
85	Thank you, Stewart. We appreciate Duke's consideration. We want to work with you and lessen the potential for future disputes.	Jennifer Washburn	N/A	(live answered)
86	Renewable Energy Portfolio slide: "Limit MISO renewables . . . to 35% through 2035" is that a limit on MISO reneables or renewables in DEIs portfolio?	sean brady		Answered by Emily Modin
87	Thanks Scott. I can't participate in the afternoon session, so just wanted to flag a couple things. 1) Is the transmission of the EnCompass files to intervenors imminent? and 2) I feel very strongly that despite the uncertainty of the MISO RA redesign you cannot pick and choose which elements of it you model. The redesign involves changes to accreditation of thermal generators that could have a significant impact on units like Eport and a 4, not two season construct which would enable to you to model seasonal withholding of units. Currently, you are picking the elements of that plan that most benefit existing and new thermal generators AND you are not modeling the current construct. I just want to say, again, that I think this is a significant oversight and a driver of the plans you are showing us today.	Anna Sommer	Live Answered	I will follow up with Anna, I don't view things that way. What we are doing is taking the current construct, which does look at it on a UCAP basis, and is not seasonal. MISO is talking about going to seasonal, but again, there are a number of parameters that are not specified. We are using a UCAP methodology and a UCAP reserve margin. She is correct in saying there is a different capacity accredidation, but that is going to imply a different reserve margin. The accredidation is not finalized, nor do we have what the corresponding reserve margin with that accreditation methodology would be. Without those, in my mind, we really don't have a modelable capacity construct. So we have, and this was done at the recommendation of stakeholders, changed our modelling to modelling on a UCAP basis, with a UCAP reserve margin, and we are mindful of what is going on in the winter. Given what we don't know about the capacity accreditation and the associated reserve margins, I will have to ask her how she would envision doing that, because I am frankly not seeing how that is done. without making some blanket guesses.
87.1	Stewart - I recommend revisiting the results of your conversation with Anna in the next meeting, does this make sense to you?		Live Answered	Scott - Yes is does.
88	Stewart. You are not muted	David Nderitu	Written	thank you. My mic shows muted. Technology is funny

#	Question / Comment	Asker Name	Response Type	Answer(s)
89	Regarding the data, as someone new to this process, I have to admit I'm overwhelmed with the presentation of so many sheets of numbers. Is this a normal format used for IRPs? Can you make available spreadsheets with all this data to help us understand the portfolios better? Not the inputs, just what you have in the slides.	Leslie Webb	Written	yes, slides were sent to those who regisered and will be on the website
89.1	Thanks, Scott. The slides are not practical for analysis. I mean provided this information in a spreadsheet form. I'm not asking for anything more than what you have made public in the slides. I'm just asking for a more useful format.		Written	I'll look into this, just to be clear, it is simply a table, there are no forumals, etc. behind it. Follow up: Excel files were emailed to Leslie Webb
90	CAC would like the complete modeling data but I'll defer to Anna and Chelsea. We have walked away for now from our other data requests (e.g. CAC Set 2 but thank you for the recently provided NERC GADS outage data). In order for this process to work, we need to look under the hood at your modeling. Let's avoid future disputes and work together	Jennifer Washburn	Written	Thanks. I think it would be helpful to meet with Scott and try to at least prioritize the data needed and come up with a timeline.
91	Yes, we would like to see all of the modeling inputs. It takes a few minutes to export data from all of the runs they have performed in EnCompass. EnCompass downloads that into a zipped folder that Duke can then send us. This is what they did for the MISO wide runs. We will want to ask follow up requests after we see the modeling inputs, but we would need to start with those to see what is in the model. The most important thing is that we have an opportunity to weigh in and offer requested changes to the inputs and modeling framework. We all just want the best work product. We look forward to talking to you. I'll check with Anna and Chelsea as to their availability.	Jennifer Washburn	Written	thanks. I think that what Scott and team are looking to do is give you, and Anna and your team a schedule for what elemements would be delivered by when.
92	Thanks, Stewart.	Jennifer Washburn	N/A	
93	Sierra Club has also requested modeling files and signed an NDA. we have received some files and would like to continue to receive results	Devi Glick	Written	Got it. Let me double check with legal on whether we have a formal request from you or need something. Either way, we will include you in the meeting and scheduling. Devi, we do not have a formal request for information from Sierra Club. Could you please discuss internally and send us a written request for what you'd like? Happy to provide - the written requests keep us organized. Thanks!
94	We would also like to talk to you next week about which additional data we need.	Devi Glick	Written	Thanks. We will include you in the meeting.
95	What is gas price now?	Ray and	Live Answered	August gas was above $4,
96	Hi Stewart, I'm hoping you will also be able to return to the coal ash question. I haven't heard it listed as one of the after-lunch topics, yet. Thanks,	Indra Frank	Written	Indra - I need to check in with some folks to make sure I understand how the costs were modeled. We will do that and respond in the written Q/As next week. Sorry, I wasn't able to track it down over lunch.
96.1	Ok. I look forward to hearing from you next week. Just in case, my email address is ifrank@hecweb.org		N/A	
97	what is normal?	Ray and	Written	For the last few years it has been in the $2-3 range.
98	Thank you, Scott.	Leslie Webb	N/A	live answered
99	The NEM Curve obviously does not reflect the impact of the end of NEM and its replacemnt with EDG @ 71/22	Michael Mullett	Written	I believe we did incorprate the law change in our NEM assumptions in the load forecast. I'll let you know if that is incorrect.
100	Sorry to be such a pain but what are the units for gas?	Ray and	Live Answered	(live answered) MMBTU (Million British Thermal Units)
101	It is simply NOT possible to reflect the "instantaneous netting" interpretation of SEA 309's definition of "excess distributed generation."	Michael Mullett	Written	I'll check.

#	Question / Comment	Asker Name	Response Type	Answer(s)
101.1	Well, if you are told something different than I am saying, then add those modeling files to the EMCC request because, literally, it is literally (i.e. mathematically) IMPOSSIBLE to get the NEM curve shown on the chart just shown with EDG, the 2.3 cents/kwh credit rate, and "instantaneous netting.		Follow-up	Informal data request responses provided to EMCC.
102	Sounds good. Thank you.	Jennifer Washburn	N/A	
103	Kindly remind us again what are the low and high gas price ranges ($)?	ANTHONY ALVAREZ	Live Answered	We presented this in the 4th meeting, In the 2030 Range the low forecast was in the $3 the base was mid $4 and the high was about $7. In 2040 the low was about S4, the mid was about $6 and the the high case was about $10. .
104	Slide 24 is helpful. But what matters most to protect the future for our kids and grandkids is carbon emissions. Can you also include a graph that shows this? And also gas MW?	Leslie Webb	Live Answered	Yes - we will show that and will have a gas chart for next time.
105	Does one of these take into account the Clean Electricity Payment Program? How will that be incorporated in this IRP process?	Wendy Bredhold	Written	That's a little too new for us to have modeled and we won't be able to incorporate that. However the Biden 100 and 90 should have a similar impact.
106	Of the portfolios presented today, which one meets Duke's corporate sustainability goals?	Leslie Webb	Written	Based on analysis done to date, we can't answer that question yet. We will have to run each of these portoflios in the various scenarios and sensitivies. See chart Scott has up now. The next meeting should provide that data.
106.1	Thanks, Kelly. Should you add a column to Scott's chart that simply indicates whether it conforms to Duke's corportate sustainability goals?		Written	That's good advice. Thanks.
107	Are you going to provide both PVRR and rate impacts?	Emily Medine	Written	Yes, we plan to do both.
108	Is the extreme weather sensitivity going to be made internally consistent across all resources so you pick up variable generator performance, correlated thermal forced outages, increased performance of DSM, decreased/increased transmission tie capability, fuel supply availability, and other assumptions for exactly the same weather conditions?	Chelsea Hotaling	Live Answered	(live answered) I will not get to that level of detail. We tried to do that a couple of IRP's ago where we tried to make assumptions about extreme weather. Here we will use the portfolio screening tool, rely on the energy mix and capacity mix of each of these portfolios and then test them using the same sets of assumptions.
109	Will the PVRR results be provided by year?	Emily Medine	Live Answered	We certainly can. This is challenging to graph given the number of dimensions on paper. Nonetheless, all of that information will be available. People will be able to see what happens over time.
110	20 years?	Emily Medine	Live Answered	Our basis is 20 years but we have modelling for 50 years
111	Stewart - The DDRE Scenario is necessarily different. There is a critical difference between a mass cap DDRE scenario and others. With respect to the CO_2 cap, is a "must" not a "want," so particular portfolios only have two outcome values: YES or NO. Only the portfolios which have a outcome value of YES would then be subjected to PVRR optimization to determine which is least cost.	Michael Mullett	Live Answered	The optimized portfolios we did in numbers 1-4 assumed the same company load forecast. The DDRE narrative includes a significant component where the rest of the economy becomes increasingly electrified, through the addition of Evs, home heating etc and so there is a load forecast that goes with that. That is just a very different scenario and since its a different size it doesnt lend itself well to comparisons because the DDRE would be so much bigger. We will also do a DDRE A and B.
111.1	Mike clarifies 3:19:51- There are two points here - the modelling framework and the extent to which in the DDRE scenario the CO_2 emissions are not just a factor they are a must. If the portfolio does not fall under the mass cap then that portfolio is out.		N/A	
112	On slide 28, should you add a row the bottom of you Decision Criteria chart that indicates whether that portfolio conforms to Duke's corportate sustainability goals?	Leslie Webb	Written	I think so - i would put it under the Environmental Sustainability section.
113	Can you provide definitions and more detail on the criteria factors shown in this scorecard? For instance, how will diversity of resources and “ability to adapt to changing circumstances” be measured? Are you measuring dispatchability and flexibility in a different manner? Having more detail on these criteria factors will help us to be able to provide better feedback to you.	Chelsea Hotaling	Live Answered	Yes, this is something we can provide in more detail at the next meeting, including how we plan to measure them and see that it is applied consistently across the portfolios.
114	What does DDRE stand for?	Ray and	Written	Deep Decarbonization / Rapid Electrification

#	Question / Comment	Asker Name	Response Type	Answer(s)
115	Regarding Scorecard Criteria Factors, Leslie made the point that reducing CO_2 early on is more valuable than removing the same qty later on. Given this, how would the CO_2 Impact Factor be applied?	Barry Kastner	Live Answered	There are a couple of ways we could do that. There could be a snapshot in time - achieve this reduction level by 20 - 25- 35. Another concept is the idea of discounted tonnes, just like a dollar in the future is worth less than a dollar today. We can apply that same concept to tonnes so that a tonne avoided in 40 is less impactful than than a tonne avoided in the near term.
116	I assume the Scorecard/Criteria Factors have different weights. Will those weights be made available?	Jim Grimes	Live Answered	They won't have weights. I am not a fan of applying weights, because they are very subjective. It does give the false impression that there is objectivity. This does become a judgement. There are a number of portfolios that behave differently differently across a number of different crtiteria. Presuming what those proper weights are is somewhat a folly. We are not going to get into weighting the criteria and then making a formula. Not to mention we would need to go beyond the weights and determine what the metrics would look like. If 10% of PVRR vs 15% of carbon but they are in dollars and tonnes, it starts to lose meaning. So it will be a case that is made for the preferred portfolio based on these criteria, but not get into weighting.
117	Could you pop it up again or send the link?	Wendy Bredhold	Written	Are you no longer able to see the survey questions?
118	A young stakeholder asked whether the recording can be made available for students who have to be in school during the day.	Leslie Webb	Written	We are not making recordings public. They are only used to capture minutes and action items. The mintes and Q/A log will be public.
119	I don't feel I have a complete understanding of the implications of these scenarios at this time to answer your survey.	Leslie Webb	Written	I understand. There will be opportunities later. The next meeting really will have a lot more data to wade through!
120	I didn't finish the poll before it disappeared, Was looking at the hybrid portolios.	Wendy Bredhold	Written	Wendy - That poll was closed but I can send you the questions, take your answer and include it in the poll. peter@vanry. com
120.1	No worries Peter. You have our prereqs for a portfolio		N/A	
121	But y'all know what we want.	Wendy Bredhold	Written	Sorry about that. Technology.... I think we do!
122	Yes. Thanks.	ANTHONY ALVAREZ	N/A	
123	The link to register on the IRP webpage is still Aug 4. Can you please update that before the next meeting?	Shannon Anderson	Written	we will make sure that everything is up to date before the next meeting
124	Thank you.	Barry Kastner	N/A	







2021 Integrated Resource Plan
Stakeholder Workshop #6

Oct 27, 2021

What are the Goals of the IRP Process

INTEGRATED RESOURCE PLAN (IRP):

DEI's plan to provide safe, reliable and sustainable energy solutions for our Customers in Indiana.

- IRPs are submitted every three years
- Plan is created with stakeholder input
- 20-year look at how DEI can cost-effectively serve our customers
- Modeling and analysis culminate in a utility preferred resource portfolio

What is a preferred resource portfolio?

"'Preferred resource portfolio' means the utility's selected long term supply-side and demand-side resource mix that safely, reliably, efficiently, and cost-effectively meets the electric system demand, taking cost, risk, and uncertainty into consideration."

IURC RM #15-06, LSA Document #18-127
Link (PDF): https://www.in.gov/iurc/files/RM_ord_20181024141710007.pdf

Agenda

9:30	Welcome & Protocols
9:40	IRP Regulatory Requirements, Stakeholder Timeline & Comments
9:50	Overview of Portfolios
10:10	Stakeholder Portfolios
10:40	Analytical Framework & Scorecard/Criteria
11:00	PVRR Analysis
11:30	CO_2 Reduction
12:00	Lunch Break
1:00	Market Purchase Analysis
1:30	Sensitivities
2:00	Timeline to Submission
2:10	Wrap Up & Portfolio Survey

DUKE ENERGY

Roadmap for Stakeholder Process

Workshop 1 Nov. 20, 2020	Workshop 2 Jan. 21, 2021	Workshop 3 April 21, 2021	Workshop 4 June 21, 2021	Workshop 5a (Aug 4) & 5b (Sept 10)	Workshop 6 Oct 27, 2021	Workshop 7 Nov 16, 2021
✓ Goals of IRP ✓ Review of 2018 IRP ✓ Contemplated changes for 2021 ✓ Load Forecasting, including: • Energy efficiency (EE) • Electric vehicles (EVs) • Distributed Energy Renewables (DERs)	✓ Recap ✓ Follow-ups: • Climate change load forecast ✓ Scenario intro ✓ AMI data ✓ Customer Programs ✓ DERs	✓ Recap ✓ Follow-ups: • Climate change load forecast • Request for Information ✓ EE and demand response (DR) modeling ✓ Scenario update ✓ Portfolio creation tool	➢ Follow-ups: • Climate change load forecast • Portfolio tool ➢ Deep dive on scenario assumptions ➢ Connecting scenarios to portfolios	➢ Follow-ups ➢ EE Bundling/ DR deep dive ➢ Retirement analysis ➢ Scorecard ➢ Optimized portfolio results for each scenario ➢ Hybrid and Stakeholder portfolios initial discussions	➢ Follow-ups ➢ Modeling results on sensitivities ➢ Hybrid and Stakeholder portfolios modeling results	➢ Follow-ups ➢ Scorecard ➢ Preferred portfolio and short-term action plan

Stakeholder scenarios due by Aug 20

Stakeholder portfolios due by Sept 20

Evening Q&A Sessions for Customers

January 20, 2021	July 26, 2021

Ongoing technical meetings and data provision

Stakeholder Comments

- *Excited to see if real changes are on the immediate horizon*
- *Reduce coal and gas powerplants and increase solar and wind power.*
- *What can you do to move swiftly toward actual clean energy?*
- *Why should we as customers pay for your incentive to go green? We already pay an exorbitant amount for a "cheaper" coal electric. Please explain this in detail. Because solar and wind power are cheaper and so we should pay less not more for you to go "green".*

Summary of Portfolios

Optimized Portfolios

1. Reference w/o CO_2 Regulation
2. Reference w/ CO_2 Regulation
3. High Gas Prices
4. Low Gas Prices

Hybrid Portfolios

5. Balanced Hybrid
6. Renewables/CC Hybrid
7. Renewables/CC/CT Hybrid
8. Renewables/CT Hybrid

Stakeholder Portfolios

9. Biden 100
10. Biden 90
11. Sierra Club
12. Reliable Energy
13. Deep Decarbonization/Rapid Electrification

Stakeholder Portfolios

Reliable Energy Portfolio

Reliable Energy	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005														
Edwardsport IGCC	618	618	618	618	618	429	429	429	429	429	429	429	429	429	429	429	429	429	429	429
Edwardsport CC																				
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	635	635	635	635	635	635
Gibson 3	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635			
Gibson 4	627	627	627	627	627	627	627	627	627											
Gibson 5	313	313	313	313	313	313	313	313	313											
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR															1,317	1,317	1,317	1,317	1,317	1,317
CC 1							1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
CC 2 & 3																				
Capacity PPAs	50		50																	
CT																			232	232
EE	53	85	119	154	184	216	260	279	303	324	342	353	363	370	386	378	368	360	357	353
DR	497	507	512	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Solar	47	447	847	1,247	1,647	2,047	2,447	2,847	3,247	3,647	4,047	4,447	4,847	5,247	5,647	6,047	6,425	6,825	6,875	6,875
Solar & Storage																				
Wind (incl Benton)	100	100	100	300	500	700	900	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,000	3,000
Storage																				

Sierra Club Portfolio

Awaiting feedback from stakeholder

DDRE Portfolio (Base Load Forecast)

Awaiting feedback from stakeholder

DDRE Portfolio (Electrification Load Forecast)

Awaiting feedback from stakeholder

Analytical Framework Template

PVRR, CO_2 Reduction & Market Purchases				SCENARIOS			
				Reference w/o CO_2 Regulation	Reference w/ CO_2 Regulation	High Gas Prices	Low Gas Prices
PORTFOLIOS	Optimized	1	Ref w/o CO_2 Reg				
		2	Ref w/ CO_2 Reg				
		3	High Gas Prices				
		4	Low Gas Prices				
	Hybrid	5	Balanced Hybrid				
		6	Renewables/CC Hybrid				
		7	Renewables/CC/CT Hybrid				
		8	Renewables/CT Hybrid				
	Stakeholder	9	Biden 100				
		10	Biden 90				
		11	Sierra Club				
		12	Reliable Energy				
		13	DDRE				

Comparing how each portfolio performs across the range of scenarios promotes better decision making

DUKE ENERGY

CO_2 Regulation Assumption

- Many possible forms of carbon policy
- Establishing a price for emissions has been proven to be an effective approach for reducing emissions in planning and operations while also simplifying modeling
- Recent policy proposals have focused on Clean Energy tax incentives or Clean Energy Standard concepts
- For consistency and simplicity, this IRP represents carbon policy by applying a cost adder on carbon emissions- effectively a shadow price on CO_2 emissions
- For purposes of the PVRR and customer bill impact calculations for CO_2 policy scenarios, the costs shown reflect the indirect effects of this shadow price on altering resource selection and cost-effective dispatch to reduce CO_2
- Imposing both indirect and direct emission costs (as in a carbon tax) would negatively impact customers, particularly low and moderate income customers

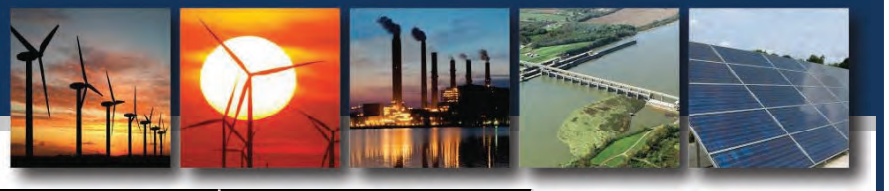
Proposed IRP Decision Criteria (Definitions)

Reliability			Resilience / Stability			Affordability		Environmental Sustainability			Portfolio Flexibility
Dispatchable Resources as a percentage of load	Can portfolio serve load in all years of IRP planning period?	Average percentage of annual market purchases	Diversity of Resources as measured by HHI	Challenges in executing portfolio	Can portfolio mix serve load in extreme weather weeks in PST?	Average of portfolio PVRRs across scenarios	5 year CAGR of rates in Ref Scenario w/o CO2	2040 CO2 Reduction % and Avg Annual Tons Emitted	On track for meeting Duke Energy Climate Goals?	SO2, Nox & PM Emissions	Range of PVRRs across scenarios

IRP SELECTION CRITERIA

				Reliability			Resilience / Stability			Affordability		Environmental Sustainability			Portfolio Flexibility
			METRIC	Dispatchable Resources as a percentage of load	Can portfolio serve load in all years of IRP planning period?	Average percentage of annual market purchases	Diversity of Resources as measured by HHI	Challenges in executing portfolio	Can portfolio mix serve load in extreme weather weeks in PST?	Average of portfolio PVRRs across scenarios	5 year CAGR of rates in Ref Scenario w/o CO2	2040 CO2 Reduction % and Avg Annual Tons Emitted	On track for meeting Duke Energy Climate Goals?	SO2, Nox & PM Emissions	Range of PVRRs across scenarios
PORTFOLIOS	Optimized	1	Ref w/o CO2 Reg												
		2	Ref w/ CO2 Reg												
		3	High Gas Prices												
		4	Low Gas Prices												
	Hybrid	5	Balanced Hybrid												
		6	Renewables/CC Hybrid												
		7	Renewables/CC/CT Hybrid												
		8	Renewables/CT Hybrid												
	Stakeholder	9	Biden 100												
		10	Biden 90												
		11	Sierra Club												
		12	Reliable Energy												
		13	DDRE												

PVRR Through 2030



PVRR Through 2030				SCENARIOS			
				Reference w/o CO_2 Regulation	Reference w/ CO_2 Regulation	High Gas Prices	Low Gas Prices
PORTFOLIOS	Optimized	1	Ref w/o CO_2 Reg	$8.8	$9.2	$9.5	$8.2
		2	Ref w/ CO_2 Reg	$8.6	$8.9	$9.6	$8.1
		3	High Gas Prices	$9.0	$9.5	$9.5	$8.3
		4	Low Gas Prices	$8.4	$8.7	$9.5	$7.9
	Hybrid	5	Balanced Hybrid	$9.6	$9.8	$10.1	$9.4
		6	Renewables/CC Hybrid	$10.0	$10.1	$10.5	$9.7
		7	Renewables/CC/CT Hybrid	$9.6	$9.9	$10.1	$9.3
		8	Renewables/CT Hybrid	$10.1	$10.4	$10.6	$9.9
	Stakeholder	9	Biden 100	$9.5	$9.7	$10.1	$9.1
		10	Biden 90	$9.4	$9.6	$10.0	$9.0
		11	Sierra Club				
		12	Reliable Energy				
		13	DDRE				

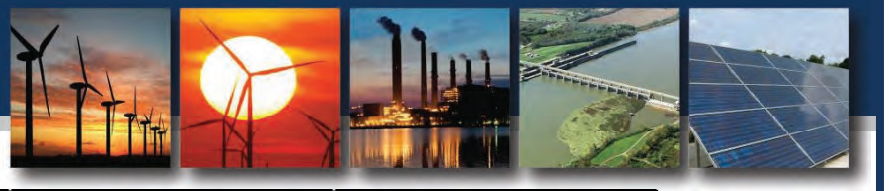
Working with Stakeholder

PVRR Through 2040

PVRR Through 2040				SCENARIOS			
				Reference w/o CO_2 Regulation	Reference w/ CO_2 Regulation	High Gas Prices	Low Gas Prices
PORTFOLIOS	Optimized	1	Ref w/o CO_2 Reg	$15.3	$17.7	$17.3	$14.1
		2	Ref w/ CO_2 Reg	$15.1	$16.1	$17.7	$14.0
		3	High Gas Prices	$15.6	$18.8	$16.8	$14.6
		4	Low Gas Prices	$15.1	$15.8	$18.7	$13.7
	Hybrid	5	Balanced Hybrid	$17.1	$18.1	$18.4	$16.6
		6	Renewables/CC Hybrid	$18.6	$18.7	$20.0	$18.0
		7	Renewables/CC/CT Hybrid	$17.4	$18.6	$19.3	$16.7
		8	Renewables/CT Hybrid	$18.8	$19.9	$20.4	$18.2
	Stakeholder	9	Biden 100	$20.9	$21.1	$21.7	$20.4
		10	Biden 90	$19.8	$20.0	$20.9	$19.2
		11	Sierra Club				
		12	Reliable Energy				
		13	DDRE				

Working with Stakeholder

CO_2 Reduction Through 2030 (vs 2005 baseline)



CO_2 Reduction Through 2030				SCENARIOS			
				Reference w/o CO_2 Regulation	Reference w/ CO_2 Regulation	High Gas Prices	Low Gas Prices
PORTFOLIOS	Optimized	1	Ref w/o CO_2 Reg	-32%	-66%	-32%	-36%
		2	Ref w/ CO_2 Reg	-68%	-68%	-57%	-58%
		3	High Gas Prices	-16%	-66%	-14%	-29%
		4	Low Gas Prices	1%	-62%	-61%	-59%
	Hybrid	5	Balanced Hybrid	-29%	-48%	-29%	-31%
		6	Renewables/CC Hybrid	-41%	-53%	-42%	-41%
		7	Renewables/CC/CT Hybrid	-43%	-53%	-55%	-44%
		8	Renewables/CT Hybrid	-44%	-55%	-44%	-45%
	Stakeholder	9	Biden 100	-47%	-73%	-47%	-50%
		10	Biden 90	-48%	-70%	-49%	-51%
		11	Sierra Club				
		12	Reliable Energy				
		13	DDRE				

Working with Stakeholder

CO_2 Reduction Through 2040 (vs 2005 baseline)

CO_2 Reduction Through 2040				SCENARIOS			
				Reference w/o CO_2 Regulation	Reference w/ CO_2 Regulation	High Gas Prices	Low Gas Prices
PORTFOLIOS	Optimized	1	Ref w/o CO_2 Reg	-32%	-76%	-33%	-47%
		2	Ref w/ CO_2 Reg	-77%	-77%	-73%	-61%
		3	High Gas Prices	-33%	-83%	-18%	-51%
		4	Low Gas Prices	-2%	-66%	-61%	-61%
	Hybrid	5	Balanced Hybrid	-31%	-58%	-32%	-39%
		6	Renewables/CC Hybrid	-77%	-81%	-78%	-77%
		7	Renewables/CC/CT Hybrid	-76%	-83%	-79%	-76%
		8	Renewables/CT Hybrid	-80%	-86%	-82%	-81%
	Stakeholder	9	Biden 100	-95%	-98%	-96%	-96%
		10	Biden 90	-89%	-92%	-89%	-89%
		11	Sierra Club				
		12	Reliable Energy				
		13	DDRE				

Working with Stakeholder

Lunch

Avg Mkt Purchases Through 2030 (% of energy)

Market Purchase Percentage Through 2030				SCENARIOS			
				Reference w/o CO_2 Regulation	Reference w/ CO_2 Regulation	High Gas Prices	Low Gas Prices
PORTFOLIOS	Optimized	1	Ref w/o CO_2 Reg	16%	37%	10%	29%
		2	Ref w/ CO_2 Reg	15%	26%	11%	25%
		3	High Gas Prices	18%	48%	10%	38%
		4	Low Gas Prices	15%	25%	10%	15%
	Hybrid	5	Balanced Hybrid	7%	15%	5%	11%
		6	Renewables/CC Hybrid	7%	11%	5%	9%
		7	Renewables/CC/CT Hybrid	13%	22%	10%	19%
		8	Renewables/CT Hybrid	11%	20%	9%	14%
	Stakeholder	9	Biden 100	11%	16%	7%	20%
		10	Biden 90	11%	17%	8%	21%
		11	Sierra Club				
		12	Reliable Energy				
		13	DDRE				

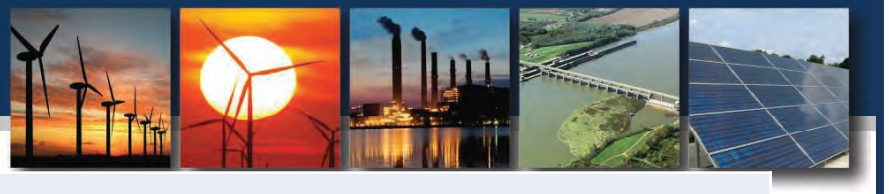
Working with Stakeholder

Avg Mkt Purchases (% of energy)

Market Purchase Percentage 2030-2040				SCENARIOS			
				Reference w/o CO_2 Regulation	Reference w/ CO_2 Regulation	High Gas Prices	Low Gas Prices
PORTFOLIOS	Optimized	1	Ref w/o CO_2 Reg	13%	56%	14%	28%
		2	Ref w/ CO_2 Reg	13%	15%	13%	12%
		3	High Gas Prices	10%	71%	8%	37%
		4	Low Gas Prices	12%	15%	13%	12%
	Hybrid	5	Balanced Hybrid	4%	19%	4%	6%
		6	Renewables/CC Hybrid	6%	10%	6%	6%
		7	Renewables/CC/CT Hybrid	20%	27%	20%	20%
		8	Renewables/CT Hybrid	19%	26%	19%	19%
	Stakeholder	9	Biden 100	11%	8%	11%	11%
		10	Biden 90	12%	9%	12%	12%
		11	Sierra Club				
		12	Reliable Energy				
		13	DDRE				

Working with Stakeholder

Sensitivities



#	Sensitivity	Rationale
1	High Load	Regulatory Requirement
2	Low Load	Regulatory Requirement
3	Weather Stress	Tests each portfolios robustness on its ability to serve load in times of extreme weather
4	RFI data	Tests the impact on the optimal portfolios in a future that assumes the RFI results
5	No market	Tests the reliance of the portfolios on its reliance on the market in terms of PVRR and ability to serve load
6	High-cost Gas Gen	Request of stakeholder to include a view where the cost of new gas generation is higher
7	Upstream GHG	Request of stakeholder to include a view where the upstream GHG emissions are considered
8	Higher Winter Wind ELCC	Test the impact of increasing the winter ELCC for wind

Timeline to Submission

Oct 27: Stakeholder Meeting 6

-(Modeling Results/Portfolio Metrics)

Nov 16: Stakeholder Meeting 7

-(Sensitivities/Present Preferred Portfolio)

Nov 30: Submit IRP

Closing Comments, Stakeholder Comments

Wrap Up

- Meeting Survey
- Comments can also be sent to:
  - Scott at: scott.park@duke-energy.com
  - Stewart at: stewart@vanry.com
- Meeting summary and other materials will be posted on website by Nov 3
  - https://www.duke-energy.com/home/products/in-2021-irp-stakeholder

APPENDIX

Acronyms

AMI	Advanced Metering Infrastructure
CHP	Combined Heat & Power
CPP	Critical Peak Pricing
CS	Small Commercial
DR	Demand Response
DER	Distributed Energy Resource
DEI	Duke Energy Indiana
DSM	Demand Side Mgt (EE + DR)
EV	Electric Vehicles
EE	Energy Efficiency
EIA	Energy Information Administration
IURC	Indiana Utility Regulatory Commission
IRP	Integrated Resource Plan
LBNL	Lawrence Berkeley National Lab
LMI	Low-Medium Income
MW	Megawatt
NEM	Net Energy Metering
NDA	Non-disclosure agreement
PPA	Purchase Power Agreement
PVRR	Present Value of Revenue Requirements
RFI	Request for Information
RS	Residential Standard
RE	Residential Electric
TOU	Time of Use
TOUD	Time of Use with Demand
T&D	Transmission and Distribution
UCAP	Unforced Capacity
UPC	Usage per Customer
VPP	Variable Peak Pricing
VPPD	Variable Peak Pricing with Demand

Resource Definitions

- Battery/Storage - Four (4) hour battery storage
- Capacity PPA (Capacity purchase power agreement) - Near term capacity needed to meet forecasted reserve margin requirements. Could be place holder for capacity only purchase or purchases of power or existing assets coming out of request for proposals (RFP). Could be renewable or conventional.
- CC (Natural Gas Combined Cycle) - Options include Class F and Class J
- CT - Natural Gas Combustion Turbine
- CT H2 –Natural Gas Combustion Turbine using Hydrogen as fuel
- Edwardsport IGCC – Edwardsport with gasifiers running primarily on coal
- Edwardsport CC – Edwardsport with natural gas only operations
- Solar – Utility scale solar
- Solar + Storage - Solar plus 4-hour battery storage
- Wind – Utility scale wind
- DR– Demand Side Management Demand Response
- EE - Energy Efficiency
- ZELFR – Zero Emitting Load Following Resources. Placeholder for future technology of this type. Modeling using estimated nuclear small modular reactor (SMR) costs. Could be any future technology that is non-emitting such as Hydrogen CC, CC with CUS, SMR, Advanced Nuclear, etc.

Optimized Portfolio for Ref w/o CO_2 Reg

OPT REF w/o CO_2 Reg	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005														
Edwardsport IGCC	618	618																		
Edwardsport CC			586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270
Gibson 3	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635
Gibson 4	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627
Gibson 5	313	313	313	313	313	313														
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR																				
CC 1							1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
CC 2 & 3																				
Capacity PPAs	50	250	400																	
CT			232	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232
EE	53	85	119	151	178	207	248	266	288	308	326	336	346	353	368	361	352	345	342	338
DR	497	507	512	607	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613
Solar	47	47	47	247	247	247	247	247	247	247	247	247	247	247	447	597	675	875	925	1,125
Solar & Storage																				
Wind (incl Benton)	100	100	100	100	100	100	100												50	50
Storage																				

Optimized Portfolio for Ref w/ CO_2 Reg

Opt Ref w/ CO_2 Reg	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005														
Edwardsport IGCC	618	618																		
Edwardsport CC			586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	635	635	635	635										
Gibson 3	635	635	635	635	635	635	635													
Gibson 4	627	627	627	627	627	627														
Gibson 5	313	313	313	313																
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR																				
CC 1							1,082	1,082	1,082	1,082	1,082	1,082	1,082	1,082	1,082	1,082	1,082	1,082	1,082	1,082
CC 2 & 3							1,082	1,082	1,082	1,082	1,082	1,082	1,082	1,082	1,082	1,082	1,082	1,082	1,082	1,082
Capacity PPAs	50	250	450																	
CT			232	232	232	232	232	232	232	232	232	232	232	232	232	464	464	464	464	464
EE	53	85	119	151	178	207	249	268	292	315	334	345	355	363	379	372	362	354	351	346
DR	497	507	512	533	538	538	538	538	538	538	538	538	538	538	538	538	538	538	538	538
Solar	47	47	147	547	547	547	547	547	747	1,097	1,497	1,897	2,297	2,697	2,897	3,097	3,275	3,475	3,675	3,875
Solar & Storage											75	75	75	75	75	75	75	75	75	75
Wind (incl Benton)	100	100	100	100	100	100	100		100	300	500	700	900	1,100	1,300	1,500	1,700	1,900	2,100	2,300
Storage																				

Optimized Portfolio for High Gas Scenario

HIGH GAS	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005
Edwardsport IGCC	618	618																		
Edwardsport CC			586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270
Gibson 3	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635
Gibson 4	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627
Gibson 5	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR																				
CC 1																				
CC 2 & 3																				
Capacity PPAs	50	250	400																	
CT			232	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232
EE	53	85	119	151	178	207	248	266	288	308	326	336	346	353	368	361	352	345	342	338
DR	497	507	512	607	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613
Solar	47	47	47	147	147	147	147	147	147	147	297	297	397	597	797	847	975	1,075	1,325	1,525
Solar & Storage				75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Wind (incl Benton)	100	100	100	100	100	100	100					200	400	600	800	1,000	1,200	1,400	1,600	1,800
Storage																				

Optimized Portfolio for Low Gas Scenario

LOW GAS	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005														
Edwardsport IGCC	618	618																		
Edwardsport CC			586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270												
Gibson 3	635	635	635	635	635	635														
Gibson 4	627	627	627	627	627	627														
Gibson 5	313	313	313	313	313															
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR																				
CC 1							1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
CC 2 & 3							1,221	1,221	2,442	2,442	2,442	2,442	2,442	2,442	2,442	2,442	2,442	2,442	2,442	2,442
Capacity PPAs	50	250	400																	
CT			232	464	464	464	464	464	464	464	464	464	464	464	464	696	696	696	928	928
EE	53	85	119	151	178	207	248	266	288	308	326	336	346	353	368	361	352	345	342	338
DR	497	507	512	533	538	538	538	538	538	538	538	538	538	538	538	538	538	538	538	538
Solar	47	47	47	47	47	47	47	47	47	47	47	47	47	197	197	197	175	175	175	175
Solar & Storage																				
Wind (incl Benton)	100	100	100	100	100	100	100											50	50	50
Storage																				

Balanced Portfolio

Balanced Hybrid	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005														
Edwardsport IGCC	618	618	618	618	618	618	618	618	618	618	618	618	618	618	618	618	618	618	618	618
Edwardsport CC																				
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270
Gibson 3	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635
Gibson 4	627	627	627	627	627	627														
Gibson 5	313	313	313	313	313	313														
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR																				
CC 1			815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815
CC 2 & 3							1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
Capacity PPAs	50	250																		
CT																				
EE	53	85	119	151	178	207	248	266	288	308	326	336	346	353	368	361	352	345	342	338
DR	497	507	512	607	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613
Solar	47	47	247	497	497	497	497	497	497	697	797	947	1,047	1,297	1,297	1,397	1,425	1,525	1,675	1,775
Solar & Storage											75	150	225	300	375	450	525	600	675	750
Wind (incl Benton)	100	100	100	150	150	150	150	50	50	150	250	350	450	550	600	800	900	1,000	1,100	1,200
Storage																				

Renewables/CC Portfolio

Renewable-CC Portfolio	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005														
Edwardsport IGCC	618	618	618	618	618	618	618	618	618	618	618	618	618	618						
Edwardsport CC															541	541	541	541	541	541
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270						
Gibson 3	635	635	635	635	635	635	635	635	635											
Gibson 4	627	627	627	627																
Gibson 5	313	313	313	313																
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR															878	878	878	878	878	878
CC 1					815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815
CC 2 & 3							1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
Capacity PPAs	50	250	500																	
CT																				
EE	53	85	119	151	178	207	249	268	292	315	334	345	355	363	380	374	365	358	355	351
DR	497	507	512	607	613	613	613	613	613	721	721	721	721	721	721	721	721	721	721	721
Solar	47	147	347	547	747	947	1,147	1,347	1,547	1,747	1,947	2,147	2,347	2,547	2,747	2,947	3,125	3,325	3,525	3,725
Solar & Storage																				
Wind (incl Benton)	100	100	200	300	400	500	600	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700	1,800
Storage																				

Renewables/CC/CT Portfolio

Ren/CC/CT Hyrbid Port	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005														
Edwardsport IGCC	618	618	618	618	618	618	618	618	618	618	618	618	618	618						
Edwardsport CC															586	586	586	586	586	586
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270						
Gibson 3	635	635	635	635	635	635	635	635												
Gibson 4	627	627	627	627	627	627	627	627												
Gibson 5	313	313	313	313																
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR																				
CC 1							1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
CC 2 & 3																				
Capacity PPAs	50	250	450																	
CT															1,160	1,160	1,160	1,160	1,160	1,160
EE	53	85	119	151	178	207	248	266	288	308	326	336	346	353	368	361	352	345	342	338
DR	497	507	512	607	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613
Solar	47	47	197	447	647	847	1,047	1,247	1,497	1,547	1,697	1,847	1,997	2,147	2,297	2,447	2,575	2,725	2,875	3,025
Solar & Storage							75	150	225	300	450	525	600	675	900	975	1,125	1,275	1,425	1,500
Wind (incl Benton)	100	100	100	100	100	100	100	100	100	200	400	600	900	1,200	1,500	1,800	2,100	2,400	2,600	2,800
Storage																				

Renewables/CT Portfolio

Renewable-CT Portfolio	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005														
Edwardsport IGCC	618	618	618	618	618	618	618	618	618	618	618	618	618	618						
Edwardsport CC															586	586	586	586	586	586
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270						
Gibson 3	635	635	635	635	635	635	635	635	635											
Gibson 4	627	627	627	627																
Gibson 5	313	313	313	313																
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR															878	878	878	878	878	878
CC 1			815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815
CC 2 & 3																				
Capacity PPAs	50	200																		
CT							1,392	1,392	1,392	1,392	1,392	1,392	1,392	1,392	1,392	1,392	1,392	1,392	1,392	1,392
EE	53	85	119	151	178	207	249	268	292	315	334	345	355	363	380	374	365	358	355	351
DR	497	507	512	607	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613
Solar	47	147	347	547	747	947	1,147	1,347	1,547	1,747	1,947	2,147	2,347	2,547	2,747	2,947	3,125	3,325	3,525	3,725
Solar & Storage											75	150	225	300	375	450	525	600	675	750
Wind (incl Benton)	100	100	200	300	400	500	600	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700	1,800
Storage																				

Biden 100 Portfolio

Biden 100 Portfolio	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	505	505	505	505													
Edwardsport IGCC	618	618																		
Edwardsport CC																				
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	635	635								
Gibson 3	635	635	635	635	635	635	635	635	635	635										
Gibson 4	627	627	627	627	627	627														
Gibson 5	313	313	313	313	313	313														
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR													1,317	1,756	2,634	2,634	2,634	2,634	2,634	2,634
CC 1			815	815	815	815	815	815	815	815	815	815	815	815						
CC 2 & 3																				
Capacity PPAs	50	250																		
CT											464	928	928	928	1,392	1,624	1,624	1,624	1,624	1,624
EE	53	85	119	154	184	216	260	280	303	324	343	353	364	371	387	379	369	361	358	354
DR	497	507	512	931	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937
Solar	47	347	347	347	1,247	1,247	1,247	1,597	2,347	3,047	3,047	3,047	3,047	3,047	3,047	3,047	3,025	3,025	3,025	3,025
Solar & Storage											150	150	150	150	150	150	150	150	225	225
Wind (incl Benton)	100	100	100	100	100	500	1,100	1,600	2,000	2,500	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700
Storage										250	750	1,050	1,050	1,150	1,500	1,500	1,500	1,500	1,500	1,550

Biden 90 Portfolio

Biden 90 Portfolio	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	505	505	505	505													
Edwardsport IGCC	618	618																		
Edwardsport CC																				
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	635	635	635	635						
Gibson 3	635	635	635	635	635	635	635													
Gibson 4	627	627	627	627	627	627	627	627	627	627										
Gibson 5	313	313	313	313	313	313														
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR													878	1,317	1,756	1,756	1,756	1,756	1,756	1,756
CC 1			815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815
CC 2 & 3																				
Capacity PPAs	50	250																		
CT											464	696	696	696	928	1,160	1,160	1,160	1,160	1,160
EE	53	85	119	154	184	216	260	280	303	324	343	353	364	371	387	379	369	361	358	354
DR	497	507	512	931	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937
Solar	47	247	247	247	1,097	1,097	1,097	1,547	2,147	2,997	3,047	3,047	3,047	3,047	3,047	3,047	3,025	3,025	3,025	3,025
Solar & Storage												75	75	75	300	375	375	600	600	600
Wind (incl Benton)	100	100	100	100	150	400	950	1,400	1,800	2,150	2,700	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,850	2,850
Storage										200	700	850	850	1,050	1,400	1,400	1,400	1,400	1,400	1,450

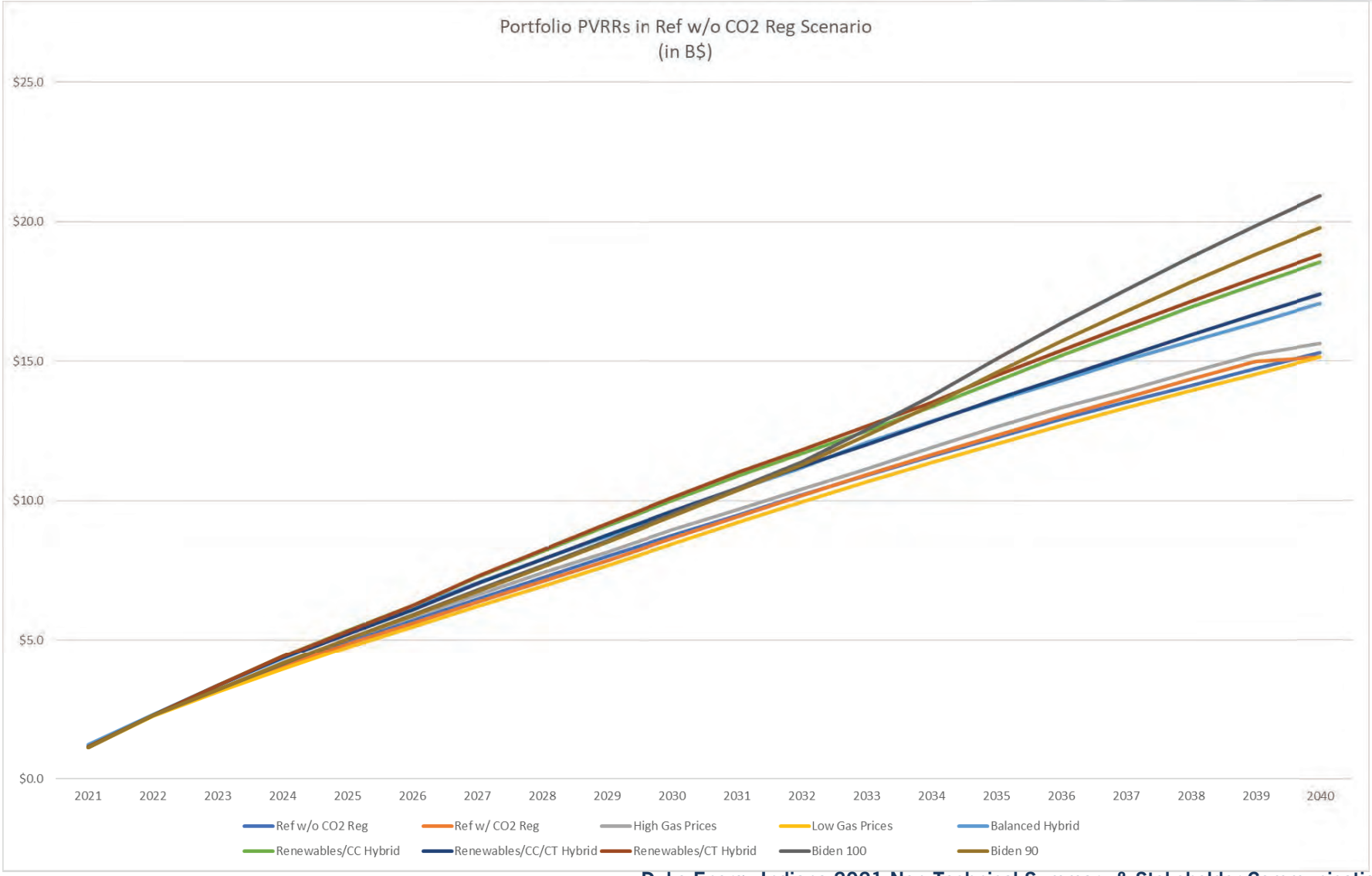
Sierra Club Portfolio

Reliable Energy Portfolio

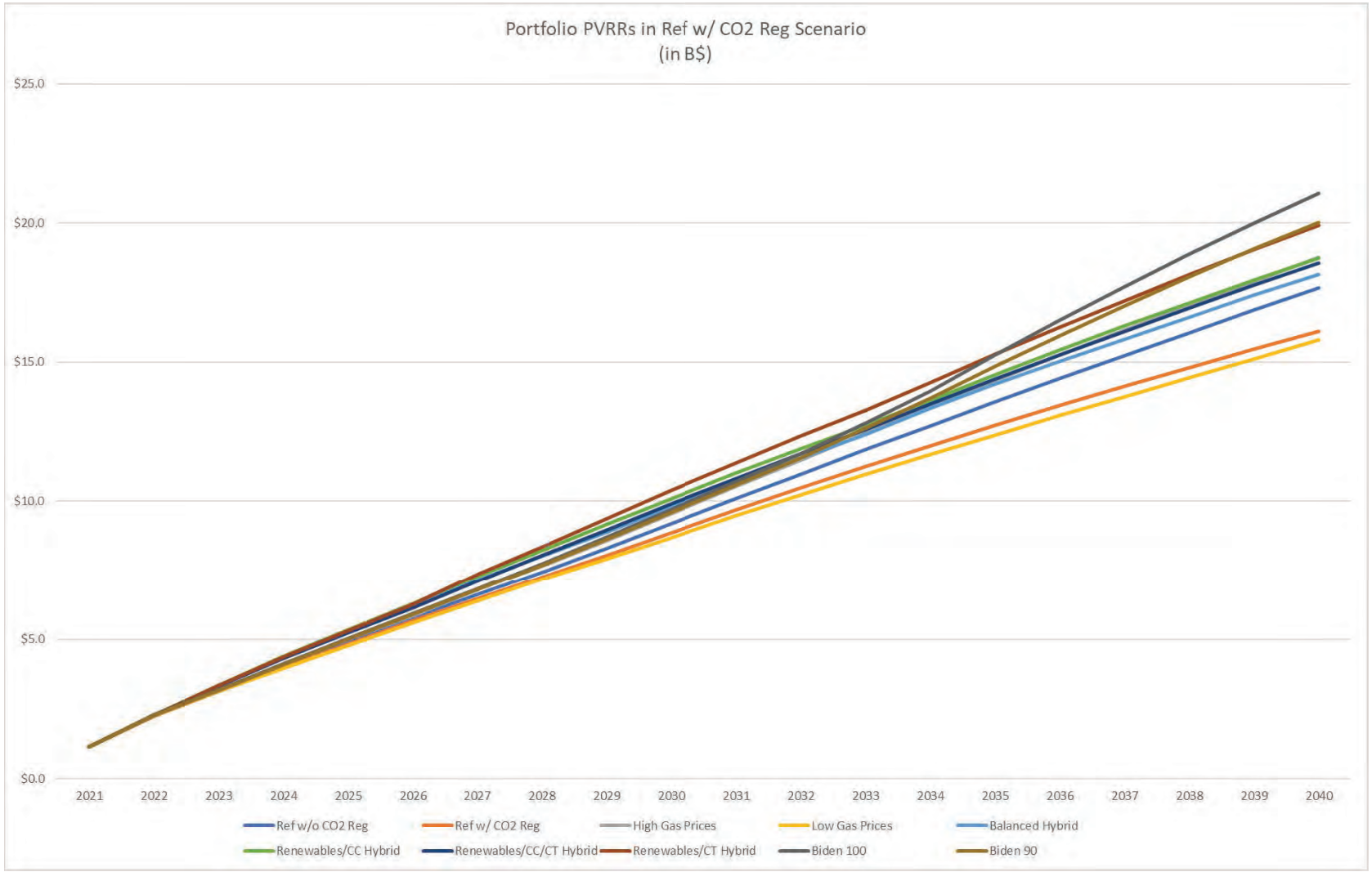
DDRE Portfolio (Base Load Forecast)

DDRE Portfolio (Electrification Load Forecast)

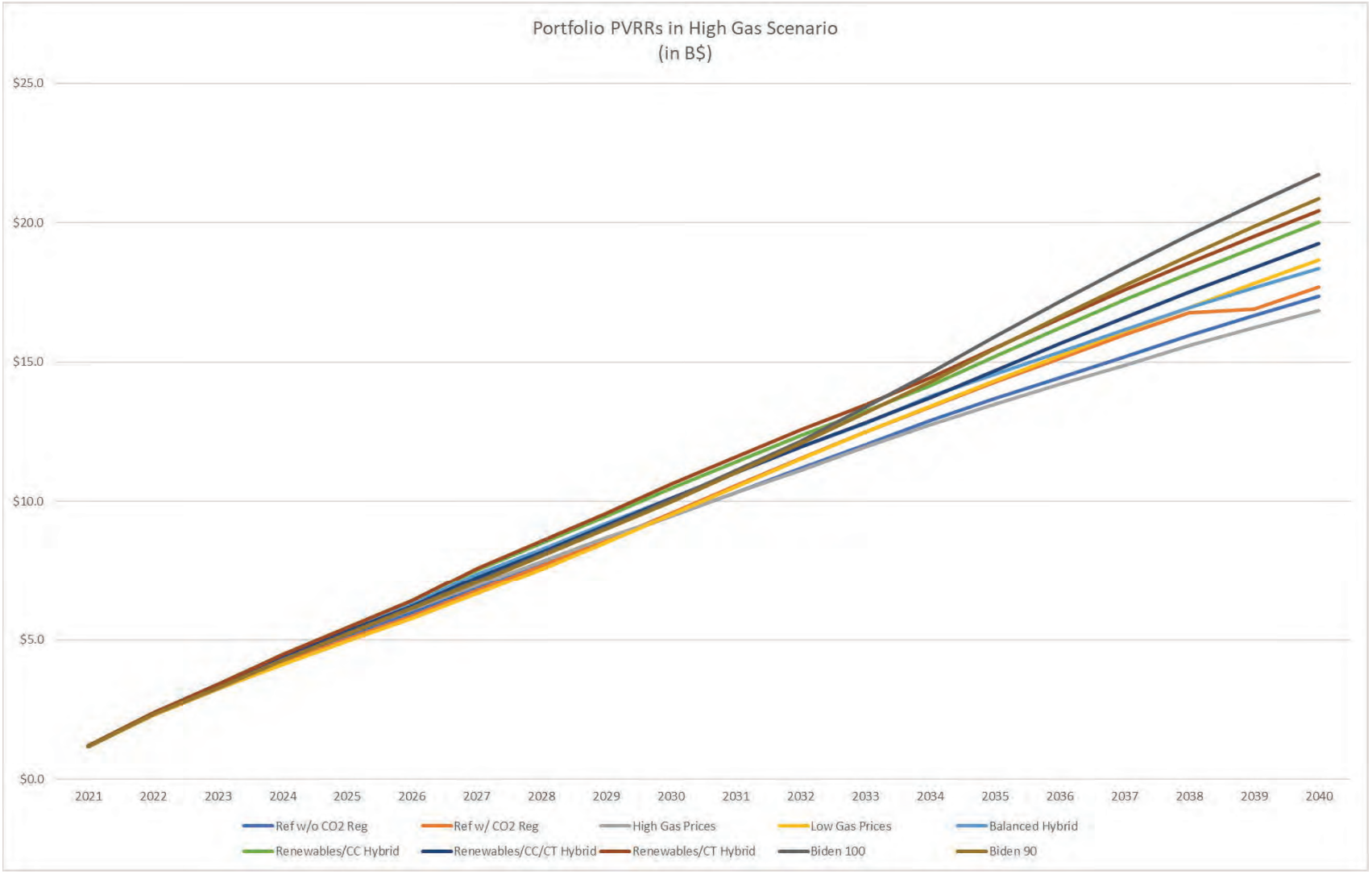
PVRR in Ref w/o CO_2 Reg



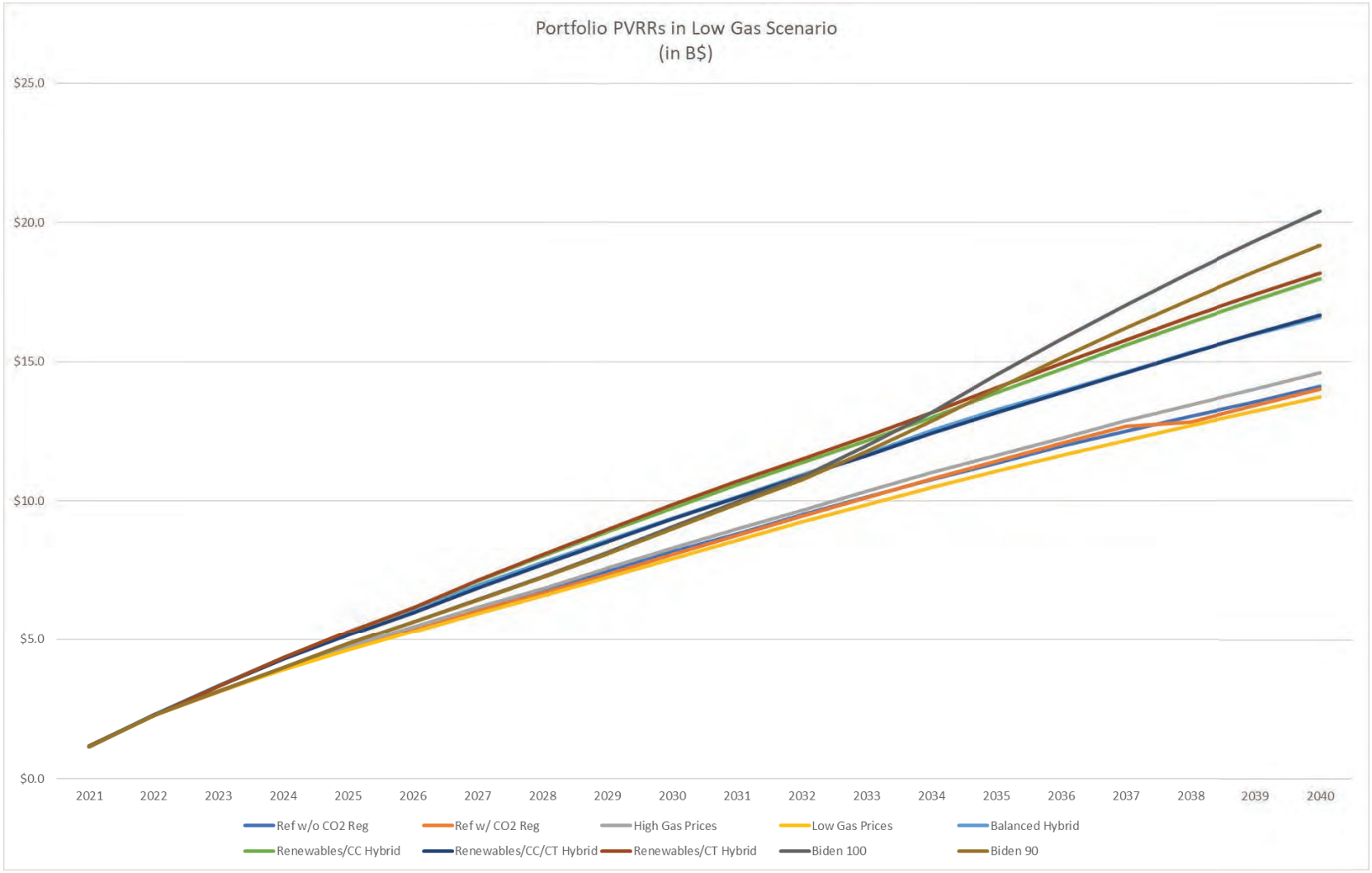
PVRR in Ref w/ CO_2 Reg



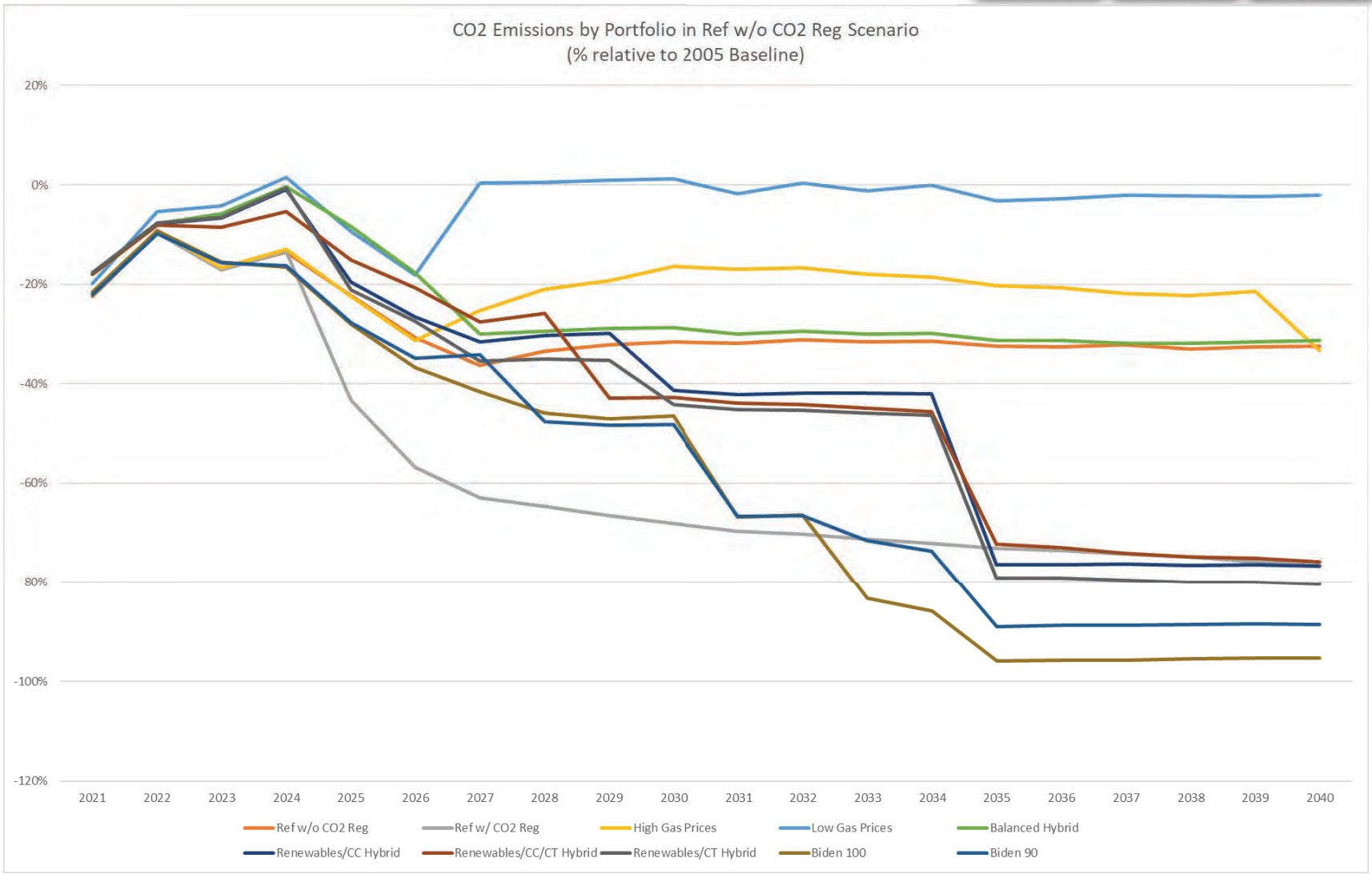
PVRR in High Gas Scenario



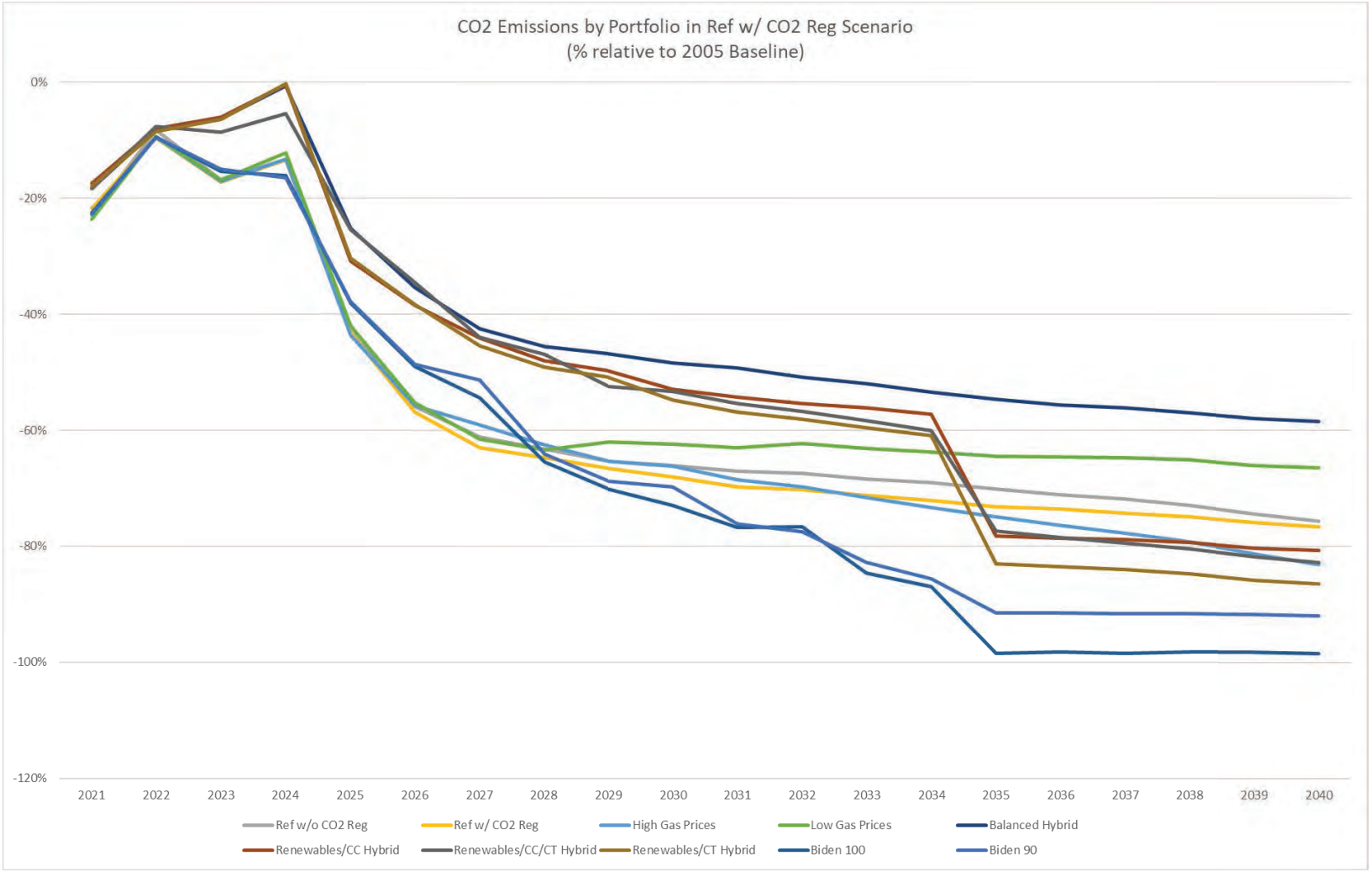
PVRR in Low Gas Scenario



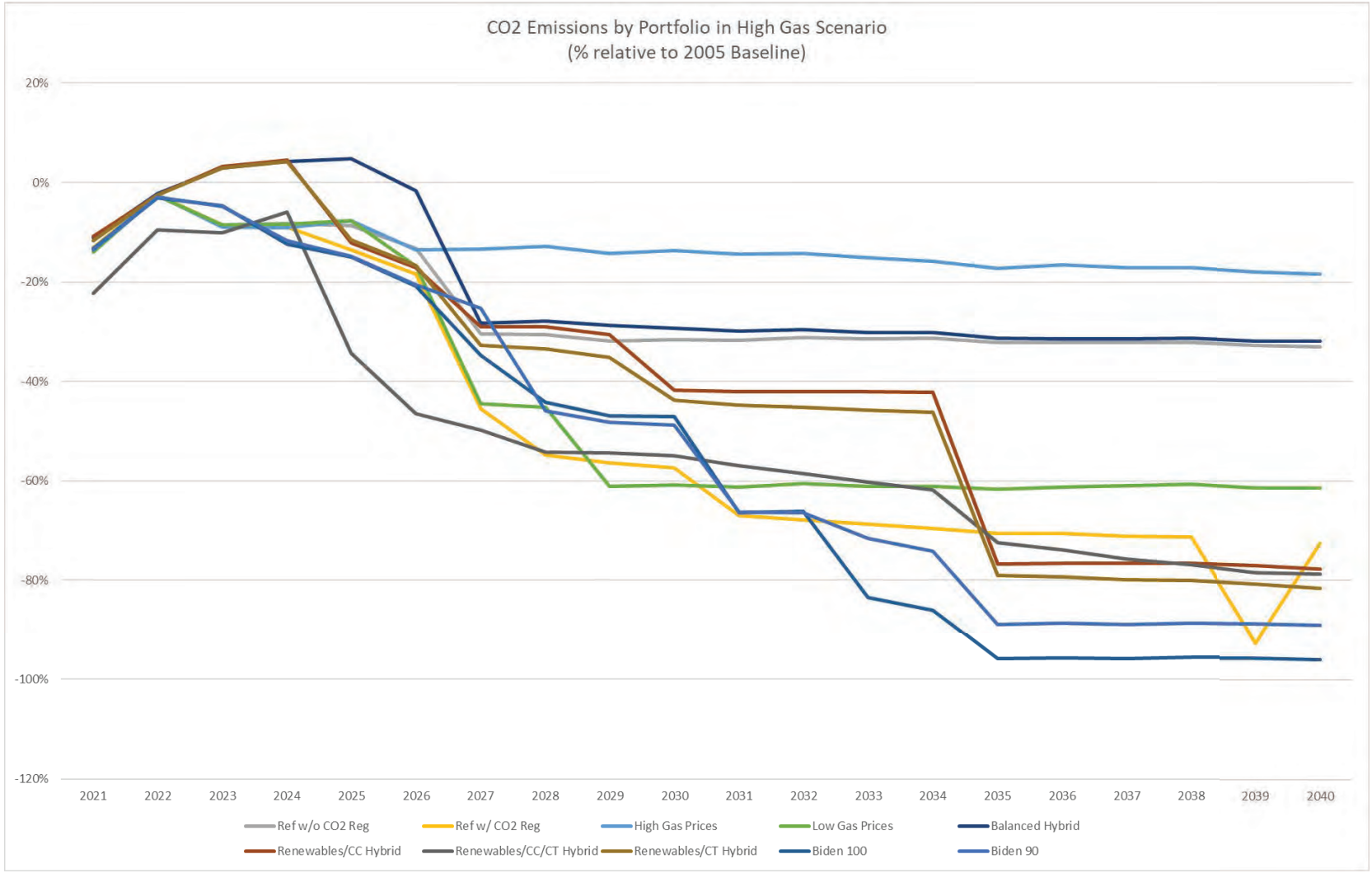
CO_2 Emissions in Ref w/o CO_2 Reg



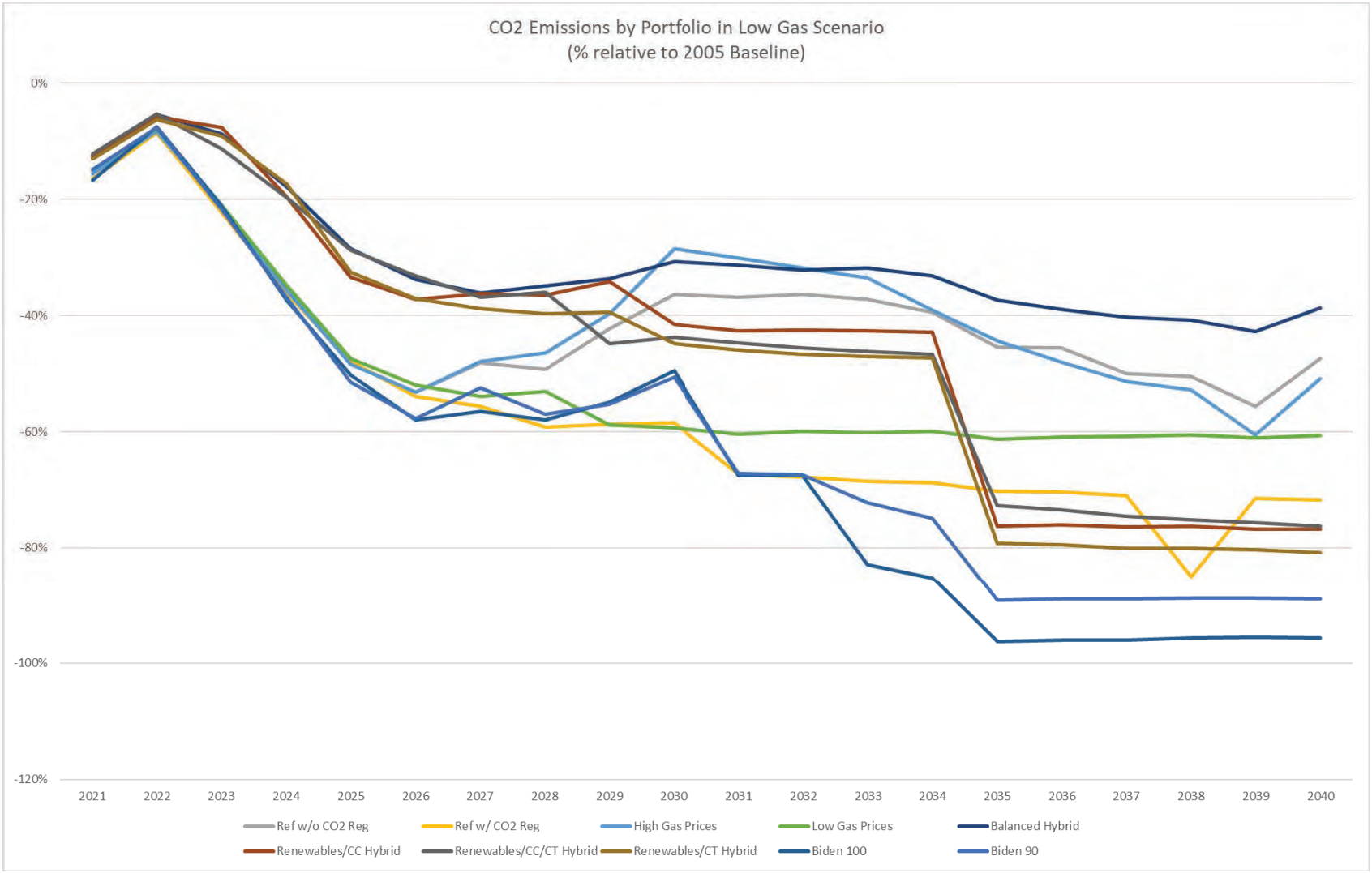
CO_2 Emissions in Ref w/ CO_2 Reg



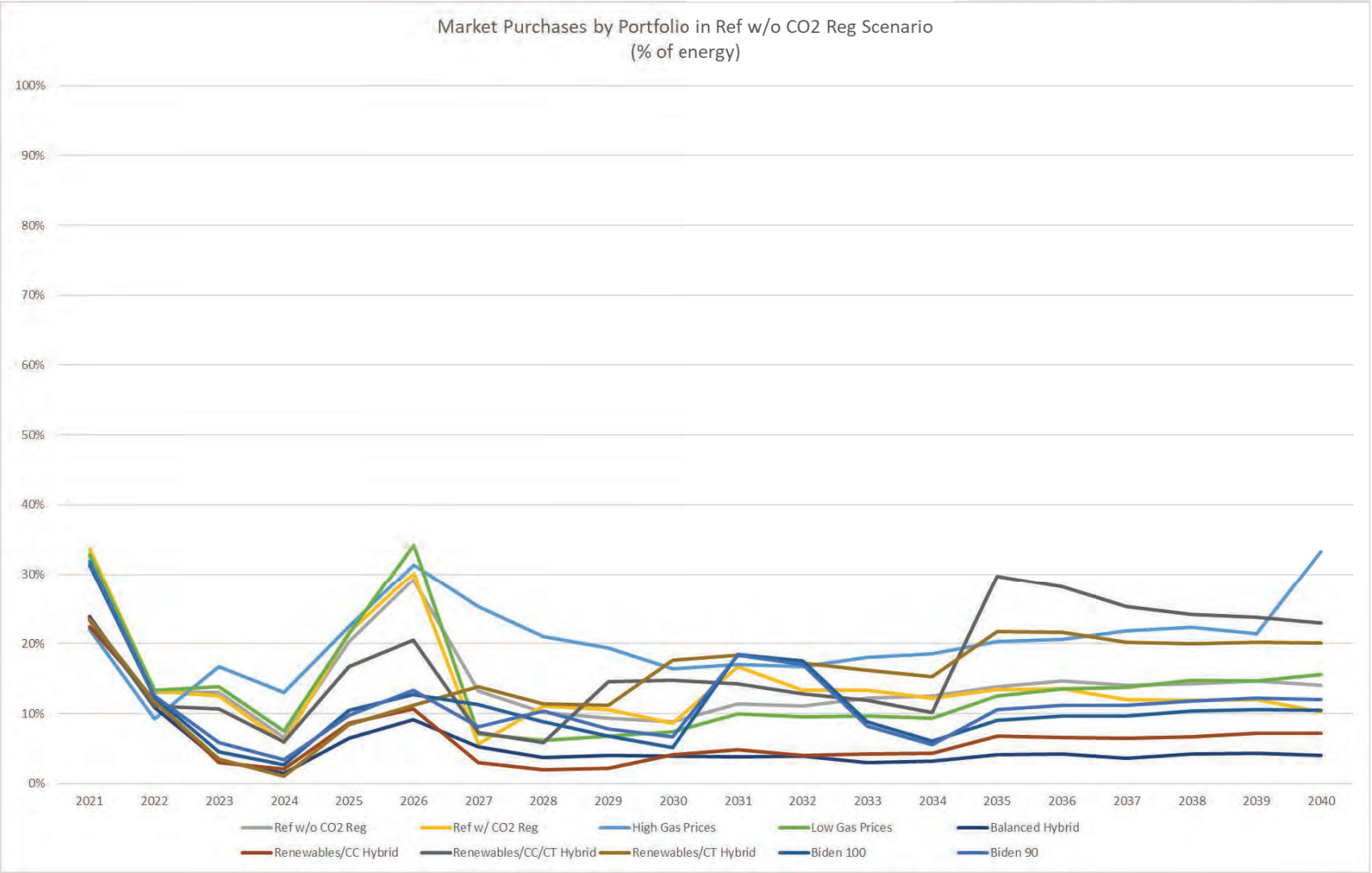
CO_2 Emissions in High Gas Scenario



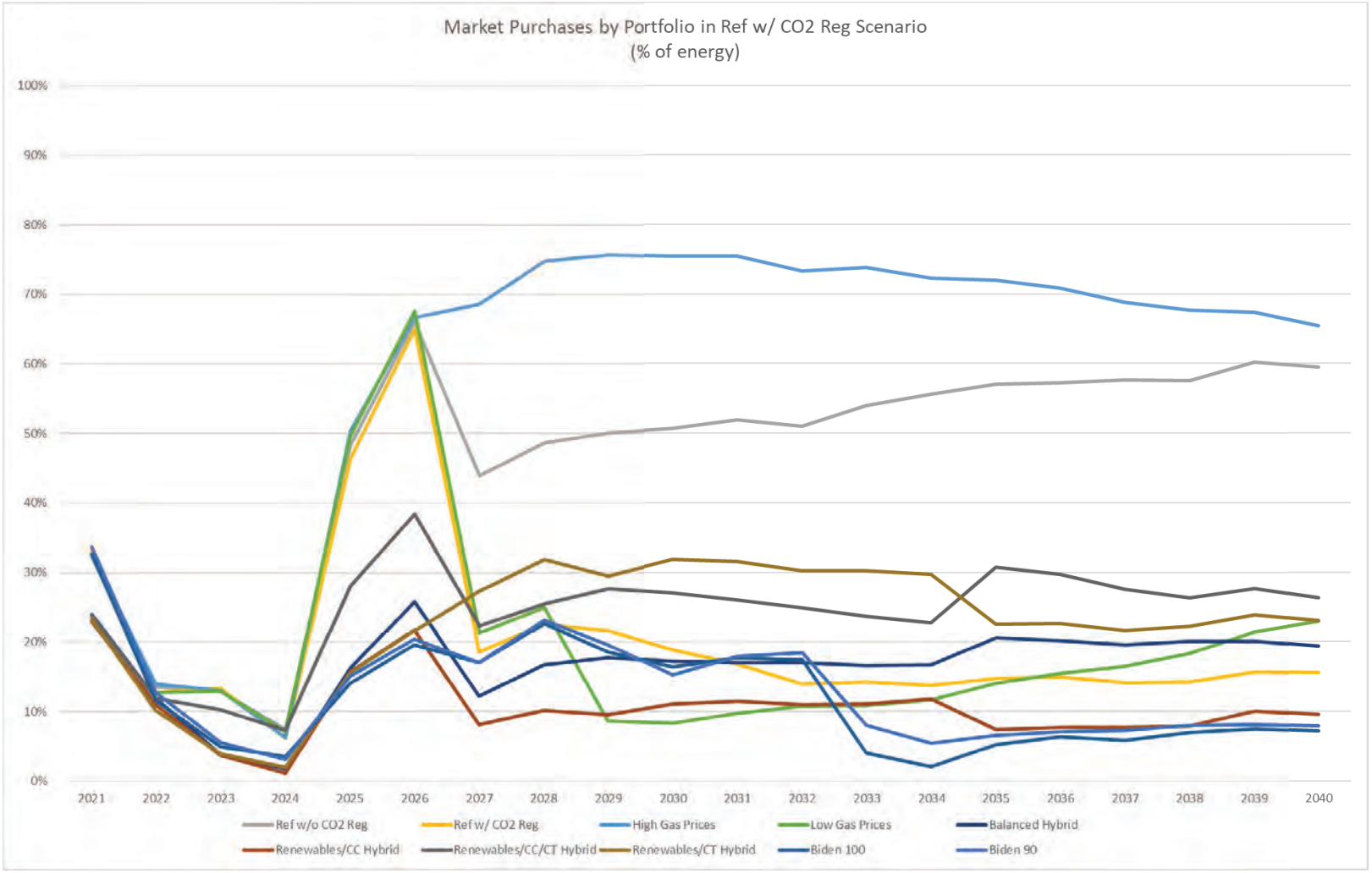
CO_2 Emissions in Low Gas Scenario



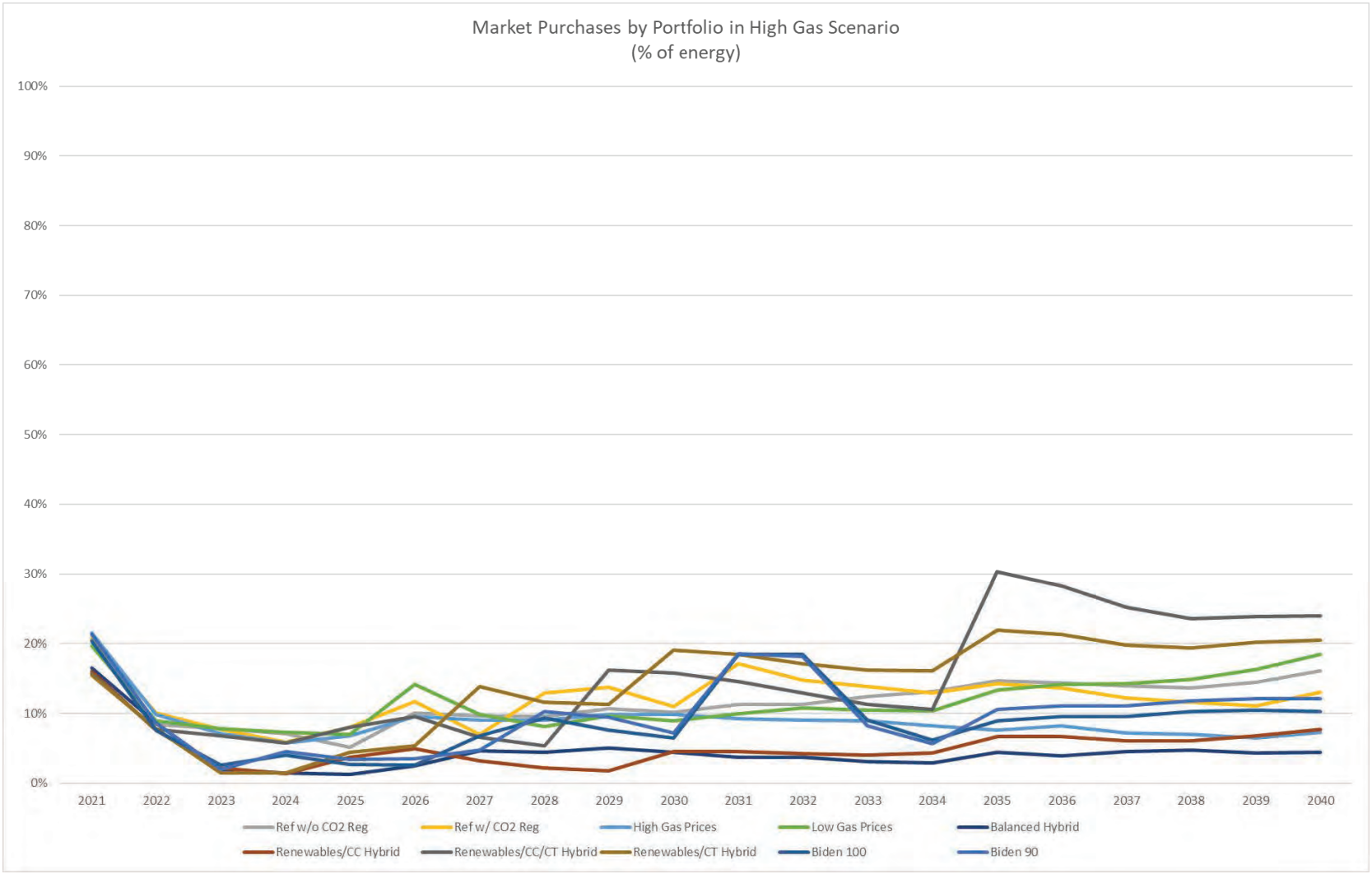
Market Purchases in Ref w/o CO_2 Reg (% of energy)



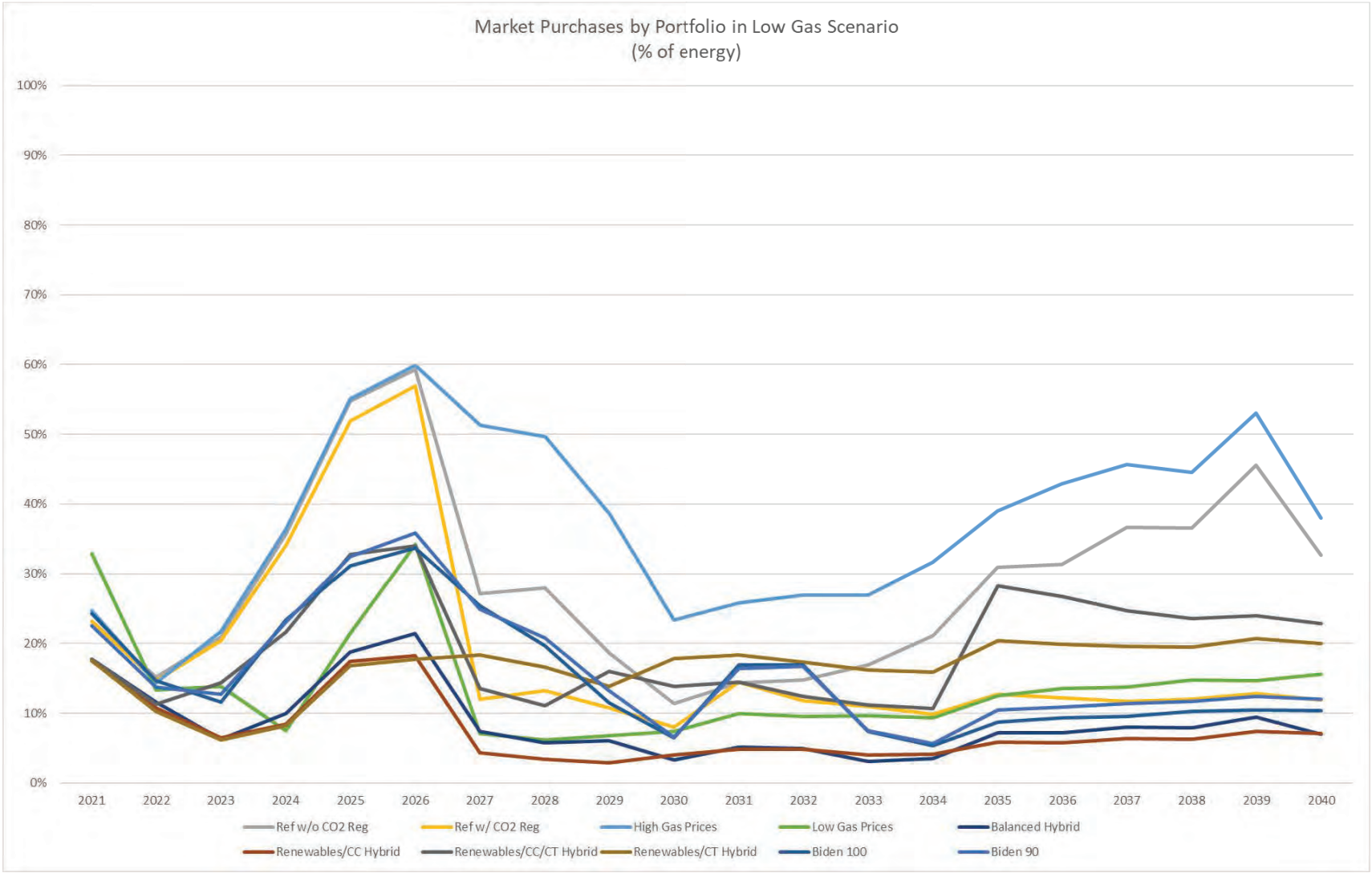
Market Purchases in Ref w/ CO_2 Reg (% of energy)



Market Purchases in High Gas Scenario (% of energy)



Market Purchases in Low Gas Scenario (% of energy)



	Duke Energy Indiana - IRP Stakeholder Meeting #6		
#	Question	Asker Name	Response(s)
1	A lot of the modeling has been finalized so unfortunately the extension hasn't helped much. We hope Duke will reconsider finalizing all this modeling and instead continue to work with us.	Jennifer Washburn	We will continue to work with Stakeholders on portfolios and modeling from now until the filing deadline. Scott will address live.
		Anna Sommer	Hi Kelley, the concerns we are raising are about the underlying assumptions used to develop those portfolios. A stakeholder portfolio doesn't address those concerns and DEI hasn't been forthcoming enough with information to allow the modeling process to even address these concerns.
		(Scott Live)	I think it would be most appropriate to handle this during when we get to the specific portfolios because each portfolio proposed is in various stages of progress. Each has unique priorities. I have been trying to check in weekly.
2	See Anna's comment please--we're talking about the underlying assumptions.	Jennifer Washburn	I read Anna's question verbatim. I hope that was acceptable
			Yes, but Scott disregarded Anna's question--she said it's not about the stakeholder portfolios--it's about the basic, underlying assumptions.
			ok. I will re ask the question as we get into the analysis and ask Anna to discuss it live with Scott. Would that work for you?
			Sure, FYI, I have to drop off now for an hour for a settlement mtg, so thanks in advance for teeing this up for Anna at that time.
	(Hand Up Comment) Regarding the summer peak versus winter peak issue - the real issue here is in the winter a polar vortex type context and to the extent you are talking about a 4 days to a week event, I am curious about the modelling about the extent you can identify the peak, be it winter or summer. We would really like to hear that discussion. How are you defining peak? And in regards to the market and the extent to which the market improves your geographic diversity as far as sources are concerned. So in terms of dealing with these polar vortex of heat dome events, the extent to which the market gives you the diversify the geography. We are also interested in storage, a crucial factor too.	Mike Mullet (Live Comment)	There is modelling space and the real world. For modelling purposes we use weather normalized load that looks at more the average. To Mikes point, we don't experience that type of load. In the scorecard we will get into looking at how the portfolios perform under extreme weather circumstances including what the output of various resources are. In modelling space we assume a certain MISO resource adequacy construct. We are moving to look at things on a seasonal basis. We are not all the way there. We will continue to monitor. Implicit in this analysis is that the MISO Resource adequacy construct is consistent over the time period that we are planning over. Utilities are in a massive transition and I think the MISO Resource Adequacy construct is going to change once again over the next 20 years. We need to keep an eye on these portfolios being diverse and able to serve customer under a number of changing circumstances.
3	To add to what Jennifer and Anna said, we only got access to transparent cost input assumptions last week, so we appreciate the engagement throughout, but this critical information was only provided very recently.	Devi Glick	Devi, we have been providing modeling information since August but understand that we've been delayed and apologize. We intend to continue to work with stakeholders between now and submission of the IRP, as well as after the IRP is submitted.
			Hi Beth, the modeling information that was provided in August only related to the modeling used to derive the wholesale market prices. We identified some concerns with that and DEI said they were in the process of modifying those files. We didn't receive any modeling files related to Duke's own system until late Sept. and when we held a meeting with your team to discuss them on Oct. 15th we were told it was too late for any changes. Originally we were told we would get modeling files in April. Perhaps you can see why we are so frustrated that this process isn't actually including stakeholder feedback?

#	Question	Asker Name	Response(s)
4	Suffice it to say at this point, DITTO for Energy Matters Community Coalition on the need for more data and more time to analyze and discuss that data in the Stakeholder Process (which for EMCC is more Scenario than Portfolio focused -- basically in order "not to get the cart before the horse").	Michael Mullett	Thanks, Mike. We will continue to work with you.
	(Hand up Question) I have been questioning how ethics is fitting into your decision process and I have not seen any evidence of this to date in your scenario building. However, the hybrid portfolios do seem to include a sense of "how can we be good citizens of the earth perspective". I think this is a good thing and should be included in all your decision making. It makes me hopeful to see that this is being considered. I have also seen a lot of advertising that as a customer Duke is going carbon neutral by 2050. This is too late for carbon neutrality for my grandchild who is being born today. I would urge you to look at 2030.	Susan Schechter	Thanks and congratulations Susan.
5	Scott said he would allow me to address the Sierra Club portfolio and I'd like to do that now with our org up on the slide please. Thank you.	Wendy Bredhold	
	(Wendy Bredhold - Live Question / Comment) I wanted to point out that Sierra Club wrote Duke last Thursday and said we are withdrawing our stakeholder portfolio. We are not comfortable because we think your gas cost assumptions are too low. I also wanted to give our expert, Devi Glick and opportunity to speak if she has anything to add.		
	Devi Glick (Live Addition) We certainly appreciate the engagement we have had with Duke but we did not receive the transparent capital costs estimates until last week so it was very hard to make the decision about whether to have a portfolio or not until we had that clear cost information. We were not comfortable with the numbers we were shown. We had asked for an alternative portfolio to be run and that was not done - a reference portfolio with the lower gas costs.	Scott	Ok - We certainly understand that and we don't need to maintain that portfolio under the Sierra Club banner. We offered two ways to look at this. One was to go back to the Sierra Club costs and see what the PVRR impacts would be. We also offered a more comprehensive view, where we would go back, look at the MISO level view, increase the cost of gas resources, reoptimize the MISO and then do the same thing at the DEI level. Essentially the difference of opinion comes from the two different sources of our data.
		Devi Glick	Happy to respond Scott - We do compare to the National Renewable Energy Lab, the EIA and the numbers provided by Horizon Energy and the Encompass Model. We also look at prices of similar projects that have actually been built. We are NOT looking just at the ATB - we are not looking at a single source.
		Scott	Given that would you like us to continue with an ATB level resource cost and follow through on that sensitivity, or would you prefer for us not to pursue a Sierra Club portfolio or high gas cost sensitivity.

#	Question	Asker Name	Response(s)
		Devi Glick	I think we are not interested in doing a Sierra Club portfolio at this time. We can talk off line but we are not interested in a Sierra Club portfolio at this time
		Scott	OK - I will get in touch with you and see if we can bring this to some kind of resolution.
6	I would like to comment briefly at this point, if possible.	Michael Mullett	Mike Mullet is invited to speak
	I wanted to present EMCC's point of view on this point which we think is critical. We are NOT withdrawing. We are very frustrated with the modeling. Duke is a player at the global level as far as climate changes is concerned. You don't quit on climate change, it is an existential threat. We don't think you can quit on Duke because, A. this modelling team is extremely talented, and capable. We think its important to have this modelling team in play. As well, I think there has been progress with this Duke "climate denial" situation. Duke as a corporate entity is beginning to recognize and respond more fully to climate scenarios, Having said this, when you are in modelling space you have to consider alternative futures and not just ones that fit into corporate profit goals, banishment preferences. We remain concerned about the extent at which the process here is too much focused on Dukes interests as a monopoly, vertically integrated utility whose top management has got an irrational love affair with gas. We are not going to quit. On Susan's point, its not just ethics. International law is being redefined to incorporate the crime of ecocide. Large global utilities like Duke are going to be candidates for being indicted in the Hague for ecocide. People are looking at the US.	Mike Mullet (Live Comment)	Stan Responding - I appreciate your passion, you and I have had discussions over the year and you are a great advocate and we all respect that but I have to respond to a couple of points. You would be very hard pressed to call Duke Energy and its predecessors at least since this issue has been at the forefront, as climate deniers,. You know better than that. You knew Jim Rogers and you knew that he was at the forefront of this discussion, prior to any other CEO. And Lynn Good has carried that on. The other point, you like to refer to us as a monopoly utility; we are a regulated utility, and you know this better than anyone, you have written books about it. We have an obligation to serve, in every situation that we can imagine. it an obligation, an expectation, from our customers and our regulators. You have that expectation of us. Its not an infatuation with gas. You know, that when you have a 6000 megawatt portfolio you need to have dispatchable energy to serve our customers, all of our customers in all of those scenarios that Scott and his team have to plan out. So, while I appreciate your advocacy, for your clients, yourself your neighbors, we are doing our best too. You will see in these portfolios that we are trying to do it in the most effective way that we can in order to ensure reliability, resiliency, affordability, and certainly sustainability is front and center for everyone at Duke Energy.
7	Devi can respond to Scott, thanks.	Wendy Bredhold	(No Response)

#	Question	Asker Name	Response(s)
	There are a lot of people who are participating in this process out of concern for our kids and grandkids - its hard to overstate the consequences we are facing. It is encouraging to see that Duke is beginning to or has acknowledged your role and hopefully you will establish the right kind of goals. I have a question about the hybrid portfolios. You seem to have a new hybrid portfolio from the last meeting until today. I am referring to Portfolio 7	Leslie Webb Live Comment	We took a look at those portfolios and we learned the lesson and are coming up with portfolios that are somewhat in the middle. You can look at these portfolios as being on a spectrum. Portfolio 7 is a kind of a combination of 6 and 8. It really is about taking advantage of a greater diversity of resources.
8	I feel certain Duke knows Sierra Club isn't going anywhere, regardless of whether we participate in the portfolio exercise.	Wendy Bredhold	Of course. We would like you to consider the sensitivity route that Scott discussed if gas prices are the main issue. But, we understand, either way.
	I have emailed Stan something like 6 or 700 petitions from Duke Customer who are Sierra Club members and we now have 1352 with 536 personal messages and I will be emailing those to you after today's meeting.	Wendy Bredhold (Live Comment)	
9	Respectfully, on the street when people hear how much coal Duke is still using in Indiana and how little renewable energy has been developed people know the utility is not prioritizing the climate.	Megan Anderson	Thanks, Megan. As you can see thru this process we are making progress on the clean energy transition and expect to continue that, while balancing affordability and reliability of the system.
			Glad to hear that but saying the utility was prioritizing climate in Indiana to this point is rewriting history. Duke could be lobbying the state to reinstate a net metering law that provides adequate credit to homeowners, allowing true shared ownership of solar through community solar projects, and much more to change the future and customers perspectives.
10	Reliable carbon pollution portfolio.	Susan Schechter	All stakeholders have equal opportunity to provide portfolios.
11	Please clarify the reduction in IGCC capacity from 618 to 429 in 2027 in the Reliable Portfolio.	Michael Mullett	Emily - yes this is correct
12	We need Duke to pull in the sustainable solution because it is a tough problem. ONE DECADE.	Susan Schechter	Thanks, we understand your views. We will use the decision criteria to ultimately choose the preferred portfolio.
13	Please clarify the Gibson 3 continued operation, especially re whether CCUS is an assumption of that continued operation.	Michael Mullett	It was kept on line because it was needed.
14	Please explain how CO_2 emissions constraint is operationalized in Reliable Portfolio.	Michael Mullett	This is a new edition and we will apply it to the scenarios and dispatch it. We will come up with a CO_2 profile for this scenario along side everything else. Reliable Energy has proposed a more comprehensive greenhouse gas view of the world where we look at upstream emissions. We will do a sensitivity on that based on the fuel burned and up the stack CO_2 emissions.
15	What does the ZELFR stand for?	Caleb Loveman	Zero Emission Load Following Resource
			Zero emitting load following resource - a placeholder for new technology in the future. Could be small nuclear, etc.
16	There was a reference to carbon capture in the discussion. What is the assumption for where the captured carbon will go? It can't be sequestered.	Aaron Schmoll	Our primary assumption is that all of it can be sequestered. I can't speak to leakage. Information Clarification from Panel - - We assumed 86% was sequestered and 14% was not.
17	Emily, where did you derive your assumptions for CCS costs? And are you assuming 90% capture, 100%, or something else?	Anna Sommer	live answered
			The first part of my question wasn’t answered.
			Anna - we'll follow up on this.

#	Question	Asker Name	Response(s)
18	(this is Tabitha Balzer, not Aaron)	Aaron Schmoll	Thanks - I think you can change the screen name if you hit the three dots.
19	Thank you for recognizing GHG is the real menace.	Susan Schechter	thanks
	RE: Slide 13 - Does that mean you are assuming a carbon tax and dividend type framework or	Michael Mullett (Live Comment)	It could be viewed that way, that there is a dividend that exactly offsets each ratepayers bill , you could look at it more like an emissions allowance. There is a cost and that causes the generator to behave differently but those direct costs don't get passed on.
	So does it show up in the PVRR or not	Michael Mullett (Live Comment)	The tax, no, but all the other impacts of changing the generating fleet are included. The impact would show up. Under these scenarios if we were dispatching carbon emitting resources whose costs are now higher as a result of this the cost of energy coming out of the resources would be higher and that is what the customer would see.
20	What costs of CCUS are incorporated in the modeling and what part are externalized?	Michael Mullett	All costs were incorporated.
21	Is carbon capture a reliable technology? I understand that it relies on a basalt reservoir.	Susan Schechter	There are pilot projects, capture is more advanced. Sequestration or storage is still under development, but there are pilots. More technology needs to develop.
22	Capture is one matter; sequestration is another	Michael Mullett	Yes - the costs of adding is in, but the overall costs of running. (Scott commits to providing more information between meetings)
23	Has there been an updated evaluation regarding the feasibility of carbon sequestration at Edwardsport since it was previously determined to be impossible? (Tabitha)	Aaron Schmoll	I am not sure it was, but we will check with engineering group on that.
24	45Q is an externalization of sequestration costs.	Michael Mullett	Thanks.
25	They go hand in glove, or no? No permanent, stable sequestration then carbon capture is not a solution. Rate payers don’t need to pay for another Edwardsport experimental boondoggle.	Susan Schechter	Respectfully disagree with Edwardsport comment. Sequestration, storage or utilization such as in enhanced oil recovery will be necessary for carbon capture to work. The sequestration does not need to be on-site.
26	Why continue to pollute, capture the pollution, insert it into the ground with unanticipated consequences like earth tremors etc.? This geotechnology is a false solution?	Denise Abdul-Rahman	Hi Denise - We are not saying that is the answer. Duke is looking into all technology options in the future, CCS, small nuclear, advanced storage, hydrogen, etc. There needs to be technology advancements in the future to meet climate goals.
			Thank you Kelley. From our perspective all of the above you mentioned are false solutions too. "Not in my backyard" Who will bear the burden of these technologies such as the waste, danger.
27	Mother nature can not be greenwashed.	Susan Schechter	Thanks for input
28	Please welcome distributed generation partners to solve this existential challenge.	Susan Schechter	We agree DG is part of the answer as well. But, small installations can't meet all our customers' needs reliably or cost effectively. So, we'll need a reliance on large scale renewables.
			The utility industry has lobbied to minimize the penetration of small distributed production. Look at the contribution to rooftop solar in Australia. They are experimenting with hydrogen production to store excess production on summer sunny days.
29	Government regulation is not the issue. Mother nature regulation is not in question.	Susan Schechter	not sure of the context on this comment. thanks.
30	I have a question about that.	Anna Sommer	live answered

#	Question	Asker Name	Response(s)
31	Will these detailed Q&As be reflected in the Meeting notes for later reference and sharing with those not in attendance today?	Michael Mullett	yes they will.
32	Last bullet. Why would increased emissions costs from carbon tax negatively impact customers if they receive a dividend from the tax revenues to pay for the increased costs? That statement seems inconsistent with your statement that Duke would not pass those costs onto the customer.	Jim Grimes	That bullet meant if we had included both the indirect and direct cost of carbon in the costs, then it would negatively impact customers. We are assuming only the indirect costs are passed on.
33	I'd like to share some thoughts about these criteria. I also have some questions about them.	Anna Sommer	live answered
34	As you look at impact on rates over the next 5 yrs., can you also look at CO_2 emissions of over the next 5 yrs. as well? As Scott said short term carbon emissions is key.	Leslie Webb	Yes. We should have that data by year.
35	Example of an indirect cost?	Jim Grimes	There is a carbon tax, so we make different decisions about retirements / resources, etc. to move away from carbon emitting resources. Those costs are included in the PVRR analysis.
36	I would definitely include the health effects of fossil fuel combustion	Ray Wilson	thank you
37	What is Duke doing to stay competitive in their grid with solar? Central grid, Mammoth proposed 2BW solar farm facility looks to be the next largest in the nation. Is Duke going to stay competitive with that amount of cheap solar? If not, what do you suspect the rate increase and profit loss to be?	Derek Reuter	Derek, we are continuing to assess the potential for adding solar to our system as part of our IRP planning. More to come on any future rate impact once resource decisions are made.
	So you represented the carbon cost as a dispatch adder which means that it increases the marginal cost of the unit. Did you apply that consistently in the modelling that comes before the optimization where you derive the market price forecast, so that your essentially dispatching against the wholesale market price that has the CO_2 cost embedded in it?	Anna Sommer (Live Comment)	Yes
	re: Slide 14 - Regarding the metric of justice for communities where plants are closing. Yes that is something that is in the bucket of accountabilities that belong with Duke, so I think it's a good thing that you are considering it. The suggestion I would make is that the manner in which you portfolio of resources effects the people and communities in which they are located is not unique to just the power plants that are being retired, its a variable or implication of all of the resources that you have in your portfolio currently, as well as those that you might develop in the future. The way to be fair about that is to be to think about jobs that would result from the portfolio as a whole. There would be reductions and additions. We need to be complete and not cherry pick one community over another. We also made recommendations earlier in our comments, that we should look at community impacts like pollution. Please refer to our earlier comments.	Anna Sommer - (Live Comment)	Scott - PST is the Portfolio Screening Tool which we demoed and made available for stakeholders. The thought here is to take the portfolios that the stakeholders have provided and in a snapshot year of 2030 or 2040 and change the resource mix to that and see how that portfolio performs in extreme weather on summer winter and shoulders. We are using the polar vortex of 2019 as a model for that extreme weather. I think the PST does cover a number of your concern areas. The reason we have gone back in time is to capture historical load radians and windspeed. Regarding your point about forced outages, that is something that changes with extreme temperatures. However, part of normal practices, additional weatherization efforts have been taken to mitigate that impact. Unfortunately we do not have a perfect representation of that relationship in the Portfolio Screening Tool. It would be an interesting analysis to look at changes in overall energy efficiency, and this would be an improvement in the next IRP to capture resource performance under weather normalized conditions versus resource performance of all kinds - traditional generators as well as energy efficient under these extreme conditions.

#	Question	Asker Name	Response(s)
	(continued) 3. My third point - you have dispatchable resources as a percentage of load. Virtually all resources on the supply side are dispatchable or can be as a product of contracting. There is a concern on our part you about whether the way you are modeling dispatchable resources - the criteria are too limiting because it does not represent the full universe of the capabilities of these resources. The questions that I have relate to the resilience and the stability criteria. Scott can you please talk about PST and the application of modelling in extreme weather? We too are concerned about the impact of weather, but our concern is about that tool (PST) is that it does not capture all the factors that occur during that winter week. I don't think it captures, for example, the fact that load seems to increase during extreme weather. It also does not capture the possibility of forced outages. And it does not capture the increases during extreme winter weather the performance of energy efficiency increases too. It offers just a partial look at all the ingredients that go into that pie. So given that the tool is not perfect and we can't really address the issues, we are interested in how the data will be adjusted in this IRP to account. Regarding executability - what does this mean and what are the thresholds?	Anna Sommer - (Live Comment)	(continued) In term of exactly what we are trying to measure in terms of executability - we will be looking at how steep the build out of a particular resource is. For example if we have a scenario that build 2 J-Class Combined Cycles simultaneously. That would be a potential issue in terms of execution. Its a question of how measured is the transition. Too much activity at once and supply chain are constraints. I understand that you would like to have a clearer sense of how executability will be transparently measured.
	We have provided feedback that the PST was a great innovation but not really ready to be used at that time. My question is are we using the same PST that we commented on before or is this an improved version? Regarding the environmental side of this, the best way to deal with CO_2 emissions is to avoid them in the first place. We need to look at the full cost picture, not just part. As far as Duke meetings its long term carbon goals, what are you doing in terms of 2040 and 2050 modelling space? My last question - it needs to be understood that rolling brownouts are a potential reality with respect to climate change - We have seen that with extreme weather events, fires, - your customers are thinking about resiliency. I am not seeing in this modelling that Duke is paying attention to this. Decentralized storage is critical, decentralized generation is critical. I am concerned that Duke is seeing this. In modelling space we need to attend to this. Would the company consider an acceleration or amendment to the IRP if the results of the RFP is known. To what extent are we seeing the impact of 2222?	Mike Mullett (Live Comment)	It is the same one, we just need to make sure we are not applying the PST too broadly. It is just information that enters the decision making process. Essentially we are going to be looking to see if we are on track. Are there sufficient renewables and are we still able to maintain a reliable system. In modelling space, we are seeing economies of scale. Next year when we issue the RFP the smaller distributed resources will be included in our analysis. IRP acceleration is a policy question I cannot answer. The impacts of 2222 will be different - I am not saying this is the last RFP, it is likely to be an ongoing cycle of RFP's - Its a long term process which responds to the evolving market. (Kelly) there are a couple of ways we can consider making changes along the way. One is the CPCN process, after you do make a decision, where the RFP results in an updated analysis. The other is that if there are material changes that occur at other levels, for example federal, we would not rule out making changes. However, the IRP three year time period is not all that long, since we start planning for it a year earlier.
38	In the Environmental Sustainability category, should effects on water be included?	Ray Wilson	thank you Ray. That is a good suggestion. We certainly will consider that.

#	Question	Asker Name	Response(s)
39	Solar's day peak with smart grid and power cell system to manage all power sources, allows peak usage hours to be hedged. Also allowing fiber/broadband to be extended cross the grid. What are Duke's plans regarding deployment of smart grid infrastructure to eliminate energy waste, direct energy management and allow for internet connectivity across the state?	Derek Reuter	We have a grid plan that focuses on reliability, resiliency and enabling the grid to accept more two way flow of power from DG, etc. We can provide more on that separate from this process.
			Thank you Kelly for the response, will your infrastructure include for storage? What energy loss measures are built in?
			I'll have to follow up with you later on the energy loss questions. The IRP does look to including storage as an option, stand alone or paired with solar. We have a couple small storage projects in place today.
			TY, please do.
40	In terms of a community metric, the overriding issue for communities is climate change weather disasters. Duke is the largest single source of carbon emissions in Indiana. Based on data from NOAA, the economic impact of billion-dollar disasters have doubled in Indiana over the last 20 years. Costs were $10-20 Billion during 2001-2020. In the U.S., billion-dollar disasters costs have more than tripled, going from $442.2 Billion (1981-2000) to $1,469.1 Billion (2001-2020). So an important community metric is to keep extreme weather from getting worse….which brings us back to reduce carbon emissions.	Leslie Webb	Thanks for the input, carbon emissions are included in the environmental sustainability criteria, as well.
41	If Duke were to promote distributed production it would make a huge positive impact .	Susan Schechter	thanks for the comment
42	Is the cost of groundwater pollution from unlined ash ponds included in the cost modelling?	Susan Schechter	We include the costs to comply with federal and state regulations related to coal ash ponds in the modeling, including ongoing groundwater monitoring.
			So you externalize that cost.
43	GHG reduction is important to everyone.	Susan Schechter	Yes, we agree it is important to everyone.
44	Equitable GHG reduction is important to our communities	Denise Abdul-Rahman	Agree. Thanks.
		Mike Mullett	EMCC agrees, but is concerned with DEI behavior as well as its rhetoric and its response to date to Community Solar is one of those situations where "actions speak louder than words"!
45	The government must force the monopoly utility to reduce harm to the planet. We're back to Duke back pedaling on GHG reduction?	Susan Schechter	I'm not sure of the context of your last comment. We are certainly not back pedaling. We have carbon reduction goals we are working toward.
46	Regarding the PVRR numbers, it looks like Portfolio 2 has a lower PVRR than Portfolio 1 in the Reference W/O CO_2 Regulation. This seems counterintuitive since Portfolio 1 is optimized for this scenario. It seems like the optimized portfolio should have the lowest cost. What am I missing?	Doug Gotham	live answered What is missing is that the optimization has a window because the model is going through a search algorithm to come up with a portfolio that minimizes cost. Part of that algorithm has a window that if it gets within .2% of the theoretical optimal it calls that optimization complete. Chris - the tolerance we have been using is .5%
47	I don't think I follow, why would consistent carbon reductions across the scenarios be important? Did I mishear and you meant PVRR?	Anna Sommer	live answered Yes! We are looking for consistently low PVRR's - to create stability and consistency - we try to apply this across the scenarios. Same as with CO_2.

#	Question	Asker Name	Response(s)
48	How do you know what the carbon emissions are associated with power purchases if you are just buying from the market?	Emily Medine	live answered Let say that in 2030 a portfolio buys one megawatt hour of energy- and we will stay with the high gas scenario. We would take a look at our MISO level modelling for 2030 which will have certain breakdown of coals, gas, renewables, etc. There will be a weighted average, for that scenario in that year, for a megawatt hour of market purchase has 1100 ponds of CO_2 associated with it and that would go into the calculation for CO_2.
49	Why does the PVRR jump so significantly from 2030 to 2040? That is almost a doubling of cost for some of these portfolios.	Anna Sommer	It's a function of how much is built in first vs the second decade. In the second decade they cost differently and they are discounted more heavily. It's a function of the build out for each of the portfolios.
50	The market is lower carbon than Duke Indiana, a priori. Yes?	Susan Schechter	live answered In general it, is. The time at which DEI would achieve parity with the market will be different with each portfolio.
51	CO_2 reductions are a "MUST"; Lower PVRR is a WANT (especially when it excludes externalities; maybe not even a WANT when the excluded externalities affect the societal costs of CO_2 reductions).	Michael Mullett	Thanks, for the input Mike. We understand. We need to balance reliability, affordability and sustainability. So, in essence finding that right balance is the must, for us.
		Michael Mullett	If climate emergency is not taken seriously the balance is off.
52	If Duke delays, it will be too late. As the largest carbon emitter in Indiana, Duke has a proportionate responsibility.	Leslie Webb	Thanks. We don't have plans to delay
		Leslie Webb	Kelly, Duke already has delayed by refusing to issue RFPs early in this IRP process.
	Talking about costs, the costs that are externalized are significant since Duke is a major greenhouse gas emitter. You are not talking about these external costs when you compare these scenarios. There is a lot less externalized cost in the Biden. It comes back down to is Duke a climate change denier or not. This is an urgent time	Susan Schechter Hand Raised	Yes, the conversation is not about if, its about when. Each of these portfolios has a different degree of when. When it comes to externalized costs, that is true, they were not captured in our carbon assumptions. We have talked about including a social cost of carbon. We could, as a post processing issue look at the practicalities.
53	Shouldn't the Biden 100 be a portfolio with inputs that result in 100% Carbon reduction by 2035 no matter what scenario world it's modeled in?	Alex Jorck	live answered Not exactly - there are times where the portfolio does interact with the market. For this exercise we have turned off the market and asked the model to come up with the lowest cost resources that still serve customers and get to zero emissions or 10% emissions by 2035. We then put that portfolio into the market. The carbon emissions are all coming from reaching out to the market. There we will be responding to the market if we emit.
54	How do these portfolios compare in terms of sales?	Anna Sommer	live answered Yes that is certainly part of the output of the model. I does not vary as much as purchases. Portfolio 2 would be an example of a portfolio with more sales. Those sales do credit the PVRR. We include the sales information in the IRP itself. I we have a carbon emitting resource that was being resourced into the market, that carbon would show up in that scenario. It would not hide from the fact that because it is earning money, it is hiding its carbon emission.
55	It would be really helpful to present these portfolio PVRRs net of sales revenue as well.	Anna Sommer	live answered This is not a difficult calculation to do.
56	Any DDRE "portfolio" would necessarily increase "sales" given the nature of the DDRE "scenario."	Michael Mullett	live answered DDRE can live in two worlds. All of these portfolios are built on the same load forecast for comparison purposes. We have talked about doing the same thing for DDRE. Having said that, the more complete picture is a bigger load which calls for a bigger portfolio.
57	Sorry, not net, but taking out the revenue from sales.	Anna Sommer	live answered

#	Question	Asker Name	Response(s)
58	Can you confirm that the MISO market prices used here are produced using the modeling files provided to stakeholders? Or have there been subsequent updates.	Devi Glick	live answered Each of these scenarios we model MISO, based on those assumptions, those resources dispatch and come up with different power prices (Chris) We have upload the latest files and updated the latest capital costs.
		Devi Glick	thank you
59	That's right Stewart.	Anna Sommer	thanks
60	How does MISO Future Three enter into the Company's MISO modeling, if at all?	Michael Mullett	live answered Because we don't have a perfect sense of what the different MISO futures are, we have come up with our own scenarios that are getting close. The MISO scenarios got a little more prescriptive with regard to resources as opposed to external factors. They are just different views of the future with a slightly different perspective.
61	I have a Noon call set on the premise of a lunch break.	Michael Mullett	Thanks Mike
62	For the next scheduled stakeholder meeting No. 7, can that be rescheduled to another date? The Duke rate case oral argument is scheduled for Nov. 16.	Aaron Schmoll	live answered We will schedule for the afternoon
		Aaron Schmoll	Thank you--that should accommodate our schedules.
63	To which scenarios are these sensitivities being applied?	Anna Sommer	(live answered) It will depend. Some of these sensitivities are more portfolio specific For example High Low and Low Load my thought would be to do the reference - with and without carbon and see what the impacts on the resource plans are . Weather stressed? That is more of a portfolio analysis. RFI Data almost creates a new scenario that we'll then test the portfolios in terms of what the impact of that will be. Where we will go there is we did the RFI, earlier this year, we got results back, we will modify the assumptions in the MISO level model based on the RFI data, come up with a new plan and power prices for MISO, and then come up with a new optimal portfolio with and without carbon . We will see, did that drive a little bit of change? Or, did it drive no change? Or a lot of change.
64	We talked about this issue earlier in the entire Stakeholder process, but please update what the Company decided re weather normalization procedure used in the modeling. (Mike goes live to clarify question) Does 30 years sill makes sense? What is being baked into the assumptions. Do we understand that extreme events needs to be captured?	Michael Mullett	live answered We have traditionally used a 30 year window. We occasionally use a shorter window but we have found that when we go to a shorter window, an extreme weather year can throw your load forecast off. I believe we have gone to a 30 year window which is the industry norm. To your latter point, that is where that climate change load forecast
		Leslie	There has been a significant step change in warming in the last 20 YEARS. https://www.ncdc.noaa.gov/cag/global/time-series/northAmerica/land/60/8/1981-2020
65	With net metering being removed and phased out, the ROI and investment models for homeowners, farmers, residential to industrial investments are nulled. Forcing higher reliance on gas and coal, not lifting the burden.	Derek Reuter	Thanks. We have included assumptions around net metering in our load forecast.
66	Could you provide us with a matrix of how these will be applied and indicate whether you are reoptimizing portfolios or not?	Anna Sommer	(live answered) Yes that is certainly something we can do when we present these results. That will be very helpful to track the results.

#	Question	Asker Name	Response(s)
67	So, indication to the regulatory commission, energy & commerce commission of state legislature, and governor could use an update on change in position and how the weight of Duke's influence is used to support an increase in net metering would be appreciated proposals and planning.	Derek Reuter	We have pending cases and discussions related to net metering, so really can't comment further in this forum on that.
		Derek Reuter	Sensitivity to market, end-users, investments small and large, could use a favorable position towards net metering. We all hope Duke's pending cases and discussions resolve towards a just and reasonable end. Thank you.
	Did you receive sufficient responses in the RFI to be able to assess solar + storage vs CCGT? If so, what did you assume for storage duration (as related to the PV size)?	John Jones	As far the RFI I don't think we got any combined cycle bids, there might have been one combustion turbine bid. I think there were just a handful of solar combined with storage bids. By far and away, the greatest number were just solar. In terms of modelling space, the utility scale solar storage configuration is 75 megawatts of solar and 20 megawatts of storage. In the RFP we are not going to be limiting that to any prescribed sizes. This will be 4 hour storage.
68		Derek Reuter	I assume details and data Duke shares are received in follow-up calls or email?
		Duke	Derek - we are sharing data with those that have NDA and submit data requests to us.
		Derek Reuter	I'll review the NDA, best I can offer at this stage.
69	I'm asking this question again because it wasn't answered: Could you provide us with a matrix of how these will be applied and indicate whether you are reoptimizing portfolios or not?	Anna Sommer	I plan to ask Scott to answer this live as soon as he and Mike are finished. Sorry about the delay.
70	My suggestion about the matrix would help facilitate feedback on how those are applied BEFORE the runs are finalized. Is the suggestion that they will be provided when the runs are finalized an indication that there is no opportunity to weigh in on this question?	Anna Sommer	live answered
		Leslie Webb	There has been a significant step change in warming in the last 20 YEARS. https://www.ncdc.noaa.gov/cag/global/time-series/northAmerica/land/60/8/1981-2020
71	So, do the Comments offered on the Q&A also show up in the Notes for the virtual meeting?	Michael Mullett	Yes they do. All of the Q&A is captured and included in the notes for each meeting.
		Duke	It is one of the reasons that we moved to this platform is so that we can capture the questions and the answers more accurately.
72	Thanks for that clarification.	Michael Mullett	
73	IF the point of the No Market sensitivity to test reliance on the market wouldn't it make more sense to just test a higher level of market prices? Because the current underlying premise of that sensitivity is that Duke becomes an island not just from a market perspective but electrically because interchange between utilities happens whether scheduled or not.	Anna Sommer	live answered That would be a different way. With higher power prices that presupposes a number of different changes that involve "how did you get to those higher prices?" Which effects things yet again. This is more of a narrow analysis of how reliant a scenario is on the market for interchange between utilities. Within context I think it is a fair comparison to see how a portfolio performs. As we have seen on the MISO slides, if MISO in general is getting shorter and shorter and more reliant upon the impact of power not every zone or utility can get into the situation where they are relying on the market to supplement their portfolios. MISO will have to change rules to make sure that doesn't happen. This sensitivity is just meant to test for self sufficiency as well as PVR Reliance.

#	Question	Asker Name	Response(s)
		Anna Sommer	Indeed, MISO has made precisely this point re DERs -- there will be there whether we know about them or model them or not. So, we need to work to improve their visibility, both for planning AND operational purposes.
		Anna Sommer (Live)	One of the reasons for not relying on the market is not really a meaningful one is like saying "everyone is going to grow their own food because I care about the reliability of my food supply. That is not realistic for electrical utilities. They cannot operate as an island, particularly when they are not an island. The transmission system transmits electricity based on the laws of physics not according to market prices. Different patterns of consumption across all different kinds of service territories support MISO wholesale and retail markets from a diversity standpoint. It does not seem realistic to assume that there is no value in that in the future.
		Stewart	I think the analogy of growing your own food is a little bit different. There is not a regulatory requirement that there that I have food on my table. There is a regulatory mandate to, in this case, make sure to serve customer load. The difference that I see here though, is that what Scott is proposing is not that the use of the market is a good or a bad thing. It is just something and pay attention to about different portfolios. It enters the conversation to ask "which do we prefer a portfolio that is more or less self sufficient?" If the market has really attractive prices we could be selling into the market.
		Anna Sommer	I would fundamentally disagree with that. I am not sure how you would derive from that sensitivity that there isn't a version being passed What this sensitivity is going to show is that to the degree that a portfolio cant dispatch upward in order to serve load its bad. This comes from the premise that any reliance on the market is bad. If the conversation is that there is an overreliance on market interchange, then why not limit that?
		Scott	Is there a threshold you are proposing?
		Anna	We would have to look at your interchange numbers right now?
	Earlier, I mentioned that as Indiana's largest single source of carbon emission, Duke has a very important role in contributing to the impact of billion-dollar disasters on our communities. These are the links to NOAA data that I referred to: For the country - https://www.ncdc.noaa.gov/billions/time-series/US For Indiana - https://www.ncdc.noaa.gov/billions/time-series/IN Reducing carbon emissions now will slow this very disturbing trend and lessen the overall damage to communities and costs to taxpayers. How are these economic impacts being factored into your selection of a preferred portfolio?	Leslie Webb	Thanks for the comment and the link. The analysis takes into account the cost of carbon and the decision criteria includes a focus on environmental sustainability.
75		Leslie Webb	Thanks, Kelley. Does Duke's analysis take into account the contribution of carbon emissions to these billion-dollar disasters? It is already affecting our communities.
76	Reliable Energy strongly disagrees with Anna's comments. We have had very good interaction, input, and feedback with Duke's modeling team in putting together our recommended portfolio. We would like to thank Duke for its cooperation	Jeffery Earl	Thanks, Jeff. We appreciate the engagement.

#	Question	Asker Name	Response(s)
		Duke	Jeff, I'm glad that you've had good luck with getting your feedback included. We'd love to be afforded the same consideration.
77	Jeff, I'd love to talk to you about that more. We haven't had an opportunity to change the underlying assumptions. My understanding is your team is working on a specific scenario	Jennifer Washburn	So I think we're talking about different things. Anna is talking about our experience in past IRPs re: stakeholder scenarios
		Duke	Jennifer, I would only add that we have proposed modeling options for the input assumption issues you have raised and we will pursue those. We have also made changes to inputs and reran the MISO runs and the DEI runs to update for input changes like renewable pricing and solar contribution, etc. The complexity of the process has certainly been challenging and we can only continue to improve each time.
		Jennifer Washburn	Thanks Kelley, we're looking for an opportunity to weigh in on DEI"s modeling too
	Three weeks ago the Hoosier Environmental Council submitted a brief which estimated the role that coal ash plays on the costs to produce electricity. Both the readily quantifiable costs but also costs to natural resources. A choice to continue using coal is a choice to continue dealing with coal ash. Coal ash is just one more problematic waste product, like GHG, which results from burning coal. It contains heavy metals, it contaminates water and soil and the metals do not biodegrade. Current regulations require monitoring disposal sites for only 30 years but the ash will last much longer than that. Looking just at DEI coal based generation, for every 10.8 megawatts DEI produced a ton of coal ash in 2019. I encourage you to rapidly	Indra Frank(Hand Raised)	
	I have a process suggestion. Our experience with Duke is inadequate time to review and collaborate around these portfolios. One way to solve this is to establish a very clear schedule for both Duke and Stakeholder - clear dates for all elements. Without that schedule the process breaks down. If the schedule needs to shift, then the whole schedule needs to shift. This is why we did not participate. It would be a huge improvement	Anna Sommers(Hand Raised)	I understand. This has been a frustrating process. We would really like to address this on the next time around.
	My one concluding comment… I do see Duke making progress. The IPR modelling team has shown a lot of responsiveness. As Susan indicated, though, it is not enough. The urgency is imposed by Mother Nature. The other things we are seeing is resistance to change to regulatory models. We see resistance on the companies part to considering changes in modelling space, which we see as imprudent. We see Duke not seeing the changing role of stakeholders and customer as a blind spot in the Duke IRP planning process, particularly as the largest electric utility in the state. We would like to see that aspect improved going forward.	Mike Mullet (Hand Raised)	I look forward to looking for ways to improve the process - by looking more comprehensive view.
		Stan	I was confused by what you meant Mike about Dukes refusal to recognize or move for change from a regulatory standpoint. Could you elaborate on this please?

#	Question	Asker Name	Response(s)
		Mike Mullet	Sure - from what I am seeing on Duke's part is resistance rather than accommodation and adjustment in a collaborative process sense. I am seeing this with DER's, with community solar, distribution system operator, the extend to which the Service Areas Assignments Act is interpreted not just as it was, a peace treaty between the IOU's and the REMC's but instead as a state franchised monopoly, which is unconstitutional. These are the things that bother me, and particularly the extent to which that resistance with a vengeful twist. Actions speak louder than words and behavior reveals motive and intentions more than words. WE have seen movement on the climate change front but it needs to be more dramatic because the imperative is there. AS far as this other issues, we are just not seeing that monopoly mentality change. We are not seeing that monopoly behavior change.
78	I'm fine with scheduling a new date than Nov 16th because of time conflicts, but I'm not ok with pushing back carbon neutrality requirement by decades and missing our window to meet the demands of air quality and climate balance.	Derek Reuter	Thanks for your input. We will keep the Nov. 16 afternoon meeting date.
79	Thanks, Kelley. We just want to work with you. Anything Duke can do to make sure we feel comfortable before Duke finalizes modeling (like we've been able to achieve with other utilities) would be appreciated so we can keep with the intent of the IRP stakeholder process rule.	Jennifer Washburn	Unanswered







2021 Integrated Resource Plan
Stakeholder Workshop #7

Nov 16, 2021

What are the Goals of the IRP Process

INTEGRATED RESOURCE PLAN (IRP):

DEI's plan to provide safe, reliable and sustainable energy solutions for our Customers in Indiana.

- IRPs are submitted every three years
- Plan is created with stakeholder input
- 20-year look at how DEI can cost-effectively serve our customers
- Modeling and analysis culminate in a utility preferred resource portfolio

What is a preferred resource portfolio?

"'Preferred resource portfolio' means the utility's selected long term supply-side and demand-side resource mix that safely, reliably, efficiently, and cost-effectively meets the electric system demand, taking cost, risk, and uncertainty into consideration."

IURC RM #15-06, LSA Document #18-127
Link (PDF): https://www.in.gov/iurc/files/RM_ord_20181024141710007.pdf

Agenda

1:00	Welcome & Protocols
1:10	IRP Regulatory Requirements, Stakeholder Timeline & Comments
1:20	Stakeholder Portfolios
1:50	PVRR, CO_2 & Market Purchase Data
2:20	Sensitivities
2:50	Anna Sommer on behalf of CAC
3:05	Analytical Framework & Scorecard/Criteria
3:50	Timeline to Submission
3:55	Wrap Up & Portfolio Survey

Roadmap for Stakeholder Process

Workshop 1 Nov. 20, 2020	Workshop 2 Jan. 21, 2021	Workshop 3 April 21, 2021	Workshop 4 June 21, 2021	Workshop 5a (Aug 4) & 5b (Sept 10)	Workshop 6 Oct 27, 2021	Workshop 7 Nov 16, 2021
✓ Goals of IRP ✓ Review of 2018 IRP ✓ Contemplated changes for 2021 ✓ Load Forecasting, including: • Energy efficiency (EE) • Electric vehicles (EVs) • Distributed Energy Renewables (DERs)	✓ Recap ✓ Follow-ups: • Climate change load forecast ✓ Scenario intro ✓ AMI data ✓ Customer Programs ✓ DERs	✓ Recap ✓ Follow-ups: • Climate change load forecast • Request for Information ✓ EE and demand response (DR) modeling ✓ Scenario update ✓ Portfolio creation tool	➢ Follow-ups: • Climate change load forecast • Portfolio tool ➢ Deep dive on scenario assumptions ➢ Connecting scenarios to portfolios	➢ Follow-ups ➢ EE Bundling/ DR deep dive ➢ Retirement analysis ➢ Scorecard ➢ Optimized portfolio results for each scenario ➢ Hybrid and Stakeholder portfolios initial discussions	➢ Follow-ups ➢ Modeling results on sensitivities ➢ Hybrid and Stakeholder portfolios modeling results	➢ Follow-ups ➢ Scorecard ➢ Preferred portfolio and short-term action plan

Stakeholder scenarios due by Aug 20

Stakeholder portfolios due by Sept 20

Evening Q&A Sessions for Customers	
January 20, 2021	July 26, 2021

Ongoing technical meetings and data provision

Stakeholder & Stakeholder Inspired Portfolios

Environmentally Focused Portfolio

Enviro Focused Portfolio	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005	1,005													
Edwardsport IGCC	618	618																		
Edwardsport CC			586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270											
Gibson 3	635	635	635	635	635	635	635	635												
Gibson 4	627	627	627	627	627	627	627	627												
Gibson 5	313	313	313	313	313	313														
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR																				
CC 1																				
CC 2 & 3																				
Capacity PPAs	50	250	500																	
CT																				
EE	53	85	119	151	178	207	249	269	293	315	335	346	356	364	381	375	366	359	356	353
DR	497	507	512	715	721	721	721	721	721	937	937	937	937	937	937	937	937	937	937	937
Solar	47	47	247	447	447	447	447	747	1,147	1,547	1,797	1,997	2,197	2,397	2,597	2,797	2,975	3,175	3,375	3,575
Solar & Storage				75	75	75	75	150	150	525	525	525	525	525	525	525	525	525	525	525
Wind (incl Benton)	100	100	100	100	100	100	300	400	600	800	1,000	1,200	1,400	1,600	1,800	1,950	2,100	2,200	2,300	2,400
Storage						100	600	1,100	1,600	2,100	2,100	2,100	2,100	2,150	2,600	2,650	2,650	2,650	2,850	2,900

Note- Table shows ICAP MW for each resource by year

Reliable Energy Portfolio

Carbon Capture and Sequestration added

Reliable Energy Portfolio	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005														
Edwardsport IGCC	618	618	618	618	618	429	429	429	429	429	429	429	429	429	429	429	429	429	429	429
Edwardsport CC																				
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	635	635	635	635	635	635
Gibson 3	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635			
Gibson 4	627	627	627	627	627	627	627	627	627											
Gibson 5	313	313	313	313	313	313	313	313	313											
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR															878	878	878	1,317	1,317	1,317
CC 1																				
CC 2 & 3							1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
Capacity PPAs	50	50	50																	
CT																			232	232
EE	53	85	119	154	184	216	260	279	303	324	342	353	363	370	386	378	368	360	357	353
DR	497	507	512	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Solar	47	397	797	1,197	1,597	1,997	2,397	2,797	3,197	3,597	3,997	4,397	4,797	5,197	5,597	5,997	6,375	6,775	6,875	6,875
Solar & Storage																				
Wind (incl Benton)	100	100	100	300	500	700	900	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,000	3,000
Storage																				

Note- Table shows ICAP MW for each resource by year

DUKE ENERGY

PVRR Through 2030 (in B$)

PVRR Through 2030				SCENARIOS			
				Reference w/o CO_2 Regulation	Reference w/ CO_2 Regulation	High Gas Prices	Low Gas Prices
PORTFOLIOS	Optimized	1	Ref w/o CO_2 Reg	$8.8	$9.2	$9.5	$8.2
		2	Ref w/ CO_2 Reg	$8.6	$8.9	$9.6	$8.1
		3	High Gas Prices	$9.0	$9.5	$9.5	$8.3
		4	Low Gas Prices	$8.4	$8.7	$9.5	$7.9
	Hybrid	5	Balanced Hybrid	$9.6	$9.8	$10.1	$9.4
		6	Renewables/CC Hybrid	$10.0	$10.1	$10.5	$9.7
		7	Renewables/CC/CT Hybrid	$9.6	$9.9	$10.1	$9.3
		8	Renewables/CT Hybrid	$10.1	$10.4	$10.6	$9.9
	Stakeholder	9	Biden 100	$9.5	$9.7	$10.1	$9.1
		10	Biden 90	$9.4	$9.6	$10.0	$9.0
		11	Enviro Focused	$9.6	$10.3	$10.4	$9.1
		12	Reliable Energy	$11.5	$11.7	$11.7	$11.1
		13	DDRE				

DUKE ENERGY

PVRR Through 2040 (in B$)

PVRR Through 2040				SCENARIOS			
				Reference w/o CO_2 Regulation	Reference w/ CO_2 Regulation	High Gas Prices	Low Gas Prices
PORTFOLIOS	Optimized	1	Ref w/o CO_2 Reg	$15.3	$17.7	$17.3	$14.1
		2	Ref w/ CO_2 Reg	$15.6	$16.1	$18.3	$14.4
		3	High Gas Prices	$15.8	$18.8	$16.8	$14.6
		4	Low Gas Prices	$15.1	$15.8	$18.7	$13.7
	Hybrid	5	Balanced Hybrid	$17.1	$18.1	$18.4	$16.6
		6	Renewables/CC Hybrid	$18.5	$18.7	$19.9	$17.9
		7	Renewables/CC/CT Hybrid	$17.4	$18.6	$19.3	$16.7
		8	Renewables/CT Hybrid	$18.7	$19.8	$20.4	$18.1
	Stakeholder	9	Biden 100	$20.9	$21.1	$21.7	$20.4
		10	Biden 90	$19.8	$20.0	$20.9	$19.2
		11	Enviro Focused	$18.4	$20.6	$21.0	$17.2
		12	Reliable Energy	$21.6	$21.8	$21.6	$21.4
		13	DDRE				

CO_2 Reduction Through 2030 (vs 2005 baseline)

CO2 Reduction Through 2030				SCENARIOS			
				Reference w/o CO_2 Regulation	Reference w/ CO_2 Regulation	High Gas Prices	Low Gas Prices
PORTFOLIOS	Optimized	1	Ref w/o CO_2 Reg	-32%	-66%	-32%	-36%
		2	Ref w/ CO_2 Reg	-68%	-68%	-57%	-58%
		3	High Gas Prices	-16%	-66%	-14%	-29%
		4	Low Gas Prices	1%	-62%	-61%	-59%
	Hybrid	5	Balanced Hybrid	-29%	-48%	-29%	-31%
		6	Renewables/CC Hybrid	-41%	-53%	-42%	-41%
		7	Renewables/CC/CT Hybrid	-43%	-53%	-55%	-44%
		8	Renewables/CT Hybrid	-44%	-55%	-44%	-45%
	Stakeholder	9	Biden 100	-47%	-73%	-47%	-50%
		10	Biden 90	-48%	-70%	-49%	-51%
		11	Enviro Focused	-66%	-73%	-64%	-67%
		12	Reliable Energy	-32%	-63%	-32%	-36%
		13	DDRE				

DUKE ENERGY

CO_2 Reduction Through 2040 (vs 2005 baseline)

CO_2 Reduction Through 2040				SCENARIOS			
				Reference w/o CO_2 Regulation	Reference w/ CO_2 Regulation	High Gas Prices	Low Gas Prices
PORTFOLIOS	Optimized	1	Ref w/o CO_2 Reg	-32%	-76%	-33%	-47%
		2	Ref w/ CO_2 Reg	-77%	-77%	-73%	-61%
		3	High Gas Prices	-19%	-83%	-18%	-51%
		4	Low Gas Prices	-2%	-66%	-61%	-61%
	Hybrid	5	Balanced Hybrid	-31%	-58%	-32%	-39%
		6	Renewables/CC Hybrid	-77%	-81%	-78%	-77%
		7	Renewables/CC/CT Hybrid	-76%	-83%	-79%	-76%
		8	Renewables/CT Hybrid	-80%	-86%	-82%	-81%
	Stakeholder	9	Biden 100	-95%	-98%	-96%	-96%
		10	Biden 90	-89%	-92%	-89%	-89%
		11	Enviro Focused	-75%	-87%	-77%	-76%
		12	Reliable Energy	-60%	-73%	-60%	-64%
		13	DDRE				

DUKE ENERGY

Avg Mkt Purchases Through 2030 (% of energy)

Market Purchase Percentage Through 2030				SCENARIOS			
				Reference w/o CO_2 Regulation	Reference w/ CO_2 Regulation	High Gas Prices	Low Gas Prices
PORTFOLIOS	Optimized	1	Ref w/o CO_2 Reg	16%	37%	10%	29%
		2	Ref w/ CO_2 Reg	15%	26%	11%	25%
		3	High Gas Prices	18%	48%	10%	38%
		4	Low Gas Prices	15%	25%	10%	15%
	Hybrid	5	Balanced Hybrid	7%	15%	5%	11%
		6	Renewables/CC Hybrid	7%	11%	5%	9%
		7	Renewables/CC/CT Hybrid	13%	22%	10%	19%
		8	Renewables/CT Hybrid	11%	20%	9%	14%
	Stakeholder	9	Biden 100	11%	16%	7%	20%
		10	Biden 90	11%	17%	8%	21%
		11	Enviro Focused	25%	43%	19%	39%
		12	Reliable Energy	12%	27%	6%	24%
		13	DDRE				

DUKE ENERGY

Avg Mkt Purchases 2030-40 (% of energy)

Market Purchase Percentage 2030-2040				SCENARIOS			
				Reference w/o CO_2 Regulation	Reference w/ CO_2 Regulation	High Gas Prices	Low Gas Prices
PORTFOLIOS	Optimized	1	Ref w/o CO_2 Reg	13%	56%	14%	28%
		2	Ref w/ CO_2 Reg	13%	15%	14%	12%
		3	High Gas Prices	10%	71%	8%	37%
		4	Low Gas Prices	12%	15%	13%	12%
	Hybrid	5	Balanced Hybrid	4%	19%	4%	6%
		6	Renewables/CC Hybrid	6%	10%	6%	6%
		7	Renewables/CC/CT Hybrid	20%	27%	20%	20%
		8	Renewables/CT Hybrid	19%	26%	19%	19%
	Stakeholder	9	Biden 100	11%	8%	11%	11%
		10	Biden 90	12%	9%	12%	12%
		11	Enviro Focused	50%	52%	51%	49%
		12	Reliable Energy	4%	14%	4%	6%
		13	DDRE				

Sensitivities

#	Sensitivity	Rationale
1	High Load	Regulatory Requirement and will be included in IRP
2	Low Load	Regulatory Requirement and will be included in IRP
3	Climate Change Load	Impact of Climate Change Load forecast on resource plan
4	RFI data	Tests the impact on the optimal portfolios in a future that assumes the RFI results
5	Higher Winter Wind ELCC	Test the impact of increasing the winter ELCC for wind
6	High-cost Gas Gen	Request of stakeholder to include a view where the cost of new gas generation is higher
7	Upstream GHG	Request of stakeholder to include a view where the upstream GHG emissions are considered
8	Social Cost of Carbon	Request of stakeholder to include a view where social costs of carbon are considered

Comparisons shown relative to Optimized Reference w/CO_2 Reg portfolio

Climate Change Load Forecast Sensitivity

Portfolio Details

Clim Chg Port	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005														
Edwardsport IGCC	618	618																		
Edwardsport CC			586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	635	635	635	635	635	635	635	635	635	635	635	635	635	635
Gibson 3	635	635	635	635	635	635	635													
Gibson 4	627	627	627	627	627	627														
Gibson 5	313	313	313	313	313	313														
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR																				
CC 1							1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
CC 2 & 3							1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
Capacity PPAs	50	250	500																	
CT																				
EE	53	85	119	151	178	207	248	266	288	308	326	336	346	353	369	363	355	348	346	343
DR	497	507	512	533	538	538	538	538	538	538	538	538	538	538	538	538	538	538	538	538
Solar	47	97	397	797	797	797	797	1,047	1,347	1,747	2,147	2,547	2,797	3,147	3,347	3,547	3,725	3,875	4,075	4,225
Solar & Storage																				
Wind (incl Benton)	100	100	100	100	100	100	100		150	350	550	750	950	1,150	1,350	1,550	1,750	1,950	2,150	2,350
Storage																				

Changes vs Ref w/CO2 Reg portfolio

Clim Chg Delta	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Gibson 1&2	0	0	0	0	0	0	0	0	0	0	635	635	635	635	635	635	635	635	635	635
Gibson 5	0	0	0	0	313	313	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Capacity PPAs	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CT	0	0	-232	-232	-232	-232	-232	-232	-232	-232	-232	-232	-232	-232	-232	-464	-464	-464	-464	-464
EE	0	0	0	0	0	0	-1	-3	-5	-6	-8	-9	-10	-11	-10	-9	-8	-6	-4	-3
Solar	0	50	250	250	250	250	250	500	600	650	650	650	500	450	450	450	450	400	400	350
Solar & Storage	0	0	0	0	0	0	0	0	0	0	-75	-75	-75	-75	-75	-75	-75	-75	-75	-75
Wind (incl Benton)	0	0	0	0	0	0	0	0	50	50	50	50	50	50	50	50	50	50	50	50

Note- Table shows ICAP MW for each resource by year

RFI Data Sensitivity

Portfolio Details

RFI Port	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005														
Edwardsport IGCC	618	618																		
Edwardsport CC			586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	635	635	635									
Gibson 3	635	635	635	635	635	635														
Gibson 4	627	627	627	627	627	627														
Gibson 5	313	313	313	313	313	313														
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR																				
CC 1							1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
CC 2 & 3							1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
Capacity PPAs	50	250	500																	
CT													232	232	464	464	464	464	696	696
EE	53	85	119	151	178	207	248	266	288	308	326	336	346	353	369	363	355	348	346	343
DR	497	507	512	533	538	538	538	538	538	538	538	538	538	538	538	538	538	538	538	538
Solar	47	47	297	697	697	697	697	697	1,097	1,497	1,897	2,297	2,547	2,747	2,947	3,147	3,325	3,525	3,725	3,925
Solar & Storage																				
Wind (incl Benton)	100	100	100	100	100	100	100			200	400	600	800	1,000	1,200	1,400	1,600	1,800	2,000	2,200
Storage																				

Changes vs Ref w/CO2 Reg portfolio

RFI Delta	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Gibson 1&2	0	0	0	0	0	0	635	635	0	0	635	0	0	0	0	0	0	0	0	0
Gibson 3	0	0	0	0	0	0	-635	0	0	0	0	0	0	0	0	0	0	0	0	0
Gibson 5	0	0	0	0	313	313	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Capacity PPAs	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CT	0	0	-232	-232	-232	-232	-232	-232	-232	-232	-232	-232	0	0	232	0	0	0	232	232
EE	0	0	0	0	0	0	-1	-3	-5	-6	-8	-9	-10	-11	-10	-9	-8	-6	-4	-3
Solar	0	0	150	150	150	150	150	150	350	400	400	400	250	50	50	50	50	50	50	50
Solar & Storage	0	0	0	0	0	0	0	0	0	0	-75	-75	-75	-75	-75	-75	-75	-75	-75	-75
Wind (incl Benton)	0	0	0	0	0	0	0	0	-100	-100	-100	-100	-100	-100	-100	-100	-100	-100	-100	-100

DUKE ENERGY

Note- Table shows ICAP MW for each resource by year

Higher Wind ELCC Sensitivity

Portfolio Details

Wind ELCC	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005	500	500	500	500										
Edwardsport IGCC	618	618																		
Edwardsport CC			586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	635													
Gibson 3	635	635	635	635	635	635														
Gibson 4	627	627	627	627	627	627														
Gibson 5	313	313	313	313	313	313	313	313												
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR																				
CC 1							1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
CC 2 & 3							1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
Capacity PPAs	50	250	450																	
CT			232	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232
EE	53	85	119	151	178	207	248	266	288	308	326	336	346	353	368	361	352	345	342	338
DR	497	507	512	607	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613
Solar	47	47	147	347	347	347	347	347	747	1,147	1,547	1,947	2,347	2,747	2,947	3,147	3,325	3,525	3,725	3,875
Solar & Storage																				75
Wind (incl Benton)	100	100	100	100	100	100	100		150	350	550	750	950	1,150	1,350	1,550	1,750	1,950	2,150	2,350
Storage																				

Changes vs Ref w/CO2 Reg portfolio

Wind ELCC Delta	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	0	0	0	0	0	0	500	500	500	500	0	0	0	0	0	0	0	0	0	0
Gibson 1&2	0	0	0	0	0	0	0	-635	-635	-635	0	0	0	0	0	0	0	0	0	0
Gibson 3	0	0	0	0	0	0	-635	0	0	0	0	0	0	0	0	0	0	0	0	0
Gibson 5	0	0	0	0	313	313	313	313	0	0	0	0	0	0	0	0	0	0	0	0
CT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-232	-232	-232	-232	-232
EE	0	0	0	0	0	0	-1	-3	-5	-6	-8	-9	-10	-11	-11	-11	-11	-10	-9	-8
DR	0	0	0	74	75	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76
Solar	0	0	0	-200	-200	-200	-200	-200	0	50	50	50	50	50	50	50	50	50	50	0
Solar & Storage	0	0	0	0	0	0	0	0	0	0	-75	-75	-75	-75	-75	-75	-75	-75	-75	0
Wind (incl Benton)	0	0	0	0	0	0	0	0	50	50	50	50	50	50	50	50	50	50	50	50

Note- Table shows ICAP MW for each resource by year

Higher Cost Gas Generation Sensitivity

Portfolio Details

High Gas Gen Cost	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005														
Edwardsport IGCC	618	618																		
Edwardsport CC			586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	635													
Gibson 3	635	635	635	635	635	635	635	635	635	635										
Gibson 4	627	627	627	627	627	627														
Gibson 5	313	313	313	313	313	313														
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR																				
CC 1							1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
CC 2 & 3							1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
Capacity PPAs	50	250	400																	
CT			232	232	232	232	232	232	232	232	232	232	232	232	232	464	464	464	464	464
EE	53	85	119	154	184	216	258	277	298	317	334	344	353	359	375	367	357	350	348	345
DR	497	507	512	533	538	538	538	538	538	538	538	538	538	538	538	538	538	538	538	538
Solar	47	47	47	347	347	347	347	597	747	1,147	1,547	1,947	2,347	2,747	2,947	3,147	3,325	3,525	3,725	3,925
Solar & Storage																				
Wind (incl Benton)	100	100	100	100	100	100	100		150	350	550	750	950	1,150	1,350	1,550	1,750	1,950	2,150	2,350
Storage																				

Changes vs Ref w/CO2 Reg portfolio

Hi Gas Gen $ Delta	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Gibson 1&2	0	0	0	0	0	0	0	-635	-635	-635	0	0	0	0	0	0	0	0	0	0
Gibson 3	0	0	0	0	0	0	0	635	635	635	0	0	0	0	0	0	0	0	0	0
Gibson 5	0	0	0	0	313	313	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Capacity PPAs	0	0	-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EE	0	0	0	2	6	9	10	8	5	3	0	-1	-2	-4	-5	-5	-5	-4	-3	-1
Solar	0	0	-100	-200	-200	-200	-200	50	0	50	50	50	50	50	50	50	50	50	50	50
Solar & Storage	0	0	0	0	0	0	0	0	0	0	-75	-75	-75	-75	-75	-75	-75	-75	-75	-75
Wind (incl Benton)	0	0	0	0	0	0	0	0	50	50	50	50	50	50	50	50	50	50	50	50

Note- Table shows ICAP MW for each resource by year

Emissions Sensitivity

Upstream GHG & Social Cost of Carbon				METRICS				
				2040 DEI Gen CO_2 Emissions (K Tons)	2040 DEI Gen CO2e Emissions with Methane (K tons)		2040 PVRR (B$)	2040 PVRR with Social Cost of Carbon (B$)
PORTFOLIOS	Optimized	1	Ref w/o CO_2 Reg	4,059	5,552		$15.3	$27.4
		2	Ref w/ CO_2 Reg	7,012	9,592		$15.6	$27.7
		3	High Gas Prices	1,012	1,385		$15.8	$26.6
		4	Low Gas Prices	10,030	13,720		$15.1	$29.0
	Hybrid	5	Balanced Hybrid	13,110	15,517		$17.1	$35.7
		6	Renewables/CC Hybrid	6,052	8,279		$18.5	$34.3
		7	Renewables/CC/CT Hybrid	4,075	5,575		$17.4	$32.6
		8	Renewables/CT Hybrid	3,009	4,116		$18.7	$33.6
	Stakeholder	9	Biden 100	0	0		$20.9	$31.3
		10	Biden 90	2,225	3,043		$19.8	$30.9
		11	Enviro Focused	999	1,366		$18.4	$28.4
		12	Reliable Energy	8,932	10,439		$21.6	$34.6
		13	DDRE					

IRP Decision Criteria (Results)

				Reliability			Resilience / Stability			Affordability		Environmental Sustainability			Portfolio Flexibility
			METRIC	Dispatchable Resources as a percentage of load[1]	Can portfolio serve load in all years of IRP planning period?[2]	Average percentage of annual market purchases[3]	Diversity of Resources as measured by HHI[4]	Executability[5]	Can portfolio mix serve load in extreme weather weeks in PST?[6]	Average of portfolio PVRRs across scenarios[7]	5 year CAGR of rates in Ref Scenario w/o CO_2[8]	2040 CO_2 Reduction % and Avg Annual Tons Emitted[9]	On track for meeting Duke Energy Climate Goals?[10]	SO2, Nox, PM & Water Emissions[11]	Range of PVRRs across scenarios[12]
				Higher better	<0.5% Acceptable	<20-25% preferred	Lower better			Lower better	Lower better	Greater reduction better			Smaller better
PORTFOLIOS	Optimized	1	Ref w/o CO_2 Reg	115%	0.24%	25%	25%	●	●	$16.1	0.8%	-47%	No	◑	$3.6
		2	Ref w/ CO_2 Reg	104%	0.36%	16%	25%	◕	◕	$16.1	0.8%	-74%	No	◕	$3.9
		3	High Gas Prices	117%	0.13%	31%	31%	●	●	$16.5	0.9%	-43%	No	◔	$4.2
		4	Low Gas Prices	118%	0.28%	15%	43%	●	●	$15.8	0.6%	-48%	No	◑	$4.9
	Hybrid	5	Balanced Hybrid	115%	0.06%	9%	19%	◕	◕	$17.5	1.4%	-40%	No	◔	$1.8
		6	Renewables/CC Hybrid	108%	0.08%	7%	15%	◑	●	$18.7	2.0%	-78%	Yes	◑	$2.0
		7	Renewables/CC/CT Hybrid	91%	0.23%	19%	17%	◕	◑	$18.0	1.3%	-78%	Yes	◑	$2.6
		8	Renewables/CT Hybrid	110%	0.05%	17%	18%	◑	●	$19.3	2.0%	-82%	Yes	◑	$2.3
	Stakeholder	9	Biden 100	102%	0.06%	12%	17%	◔	◕	$21.0	1.7%	-96%	Yes	◕	$1.3
		10	Biden 90	97%	0.26%	13%	17%	◔	◕	$20.0	1.5%	-90%	Yes	◕	$1.7
		11	Enviro Focused	84%	3.70%	41%	18%	◑	○	$19.3	1.1%	-79%	Yes	◕	$3.8
		12	Reliable Energy	98%	0.16%	12%	19%	◑	◑	$21.6	2.5%	-64%	No	◑	$0.4
		13	DDRE												

Notes- Metric Details in Appendix

○	◔	◑	◕	●
Poor	Fair	Good	Very Good	Excellent

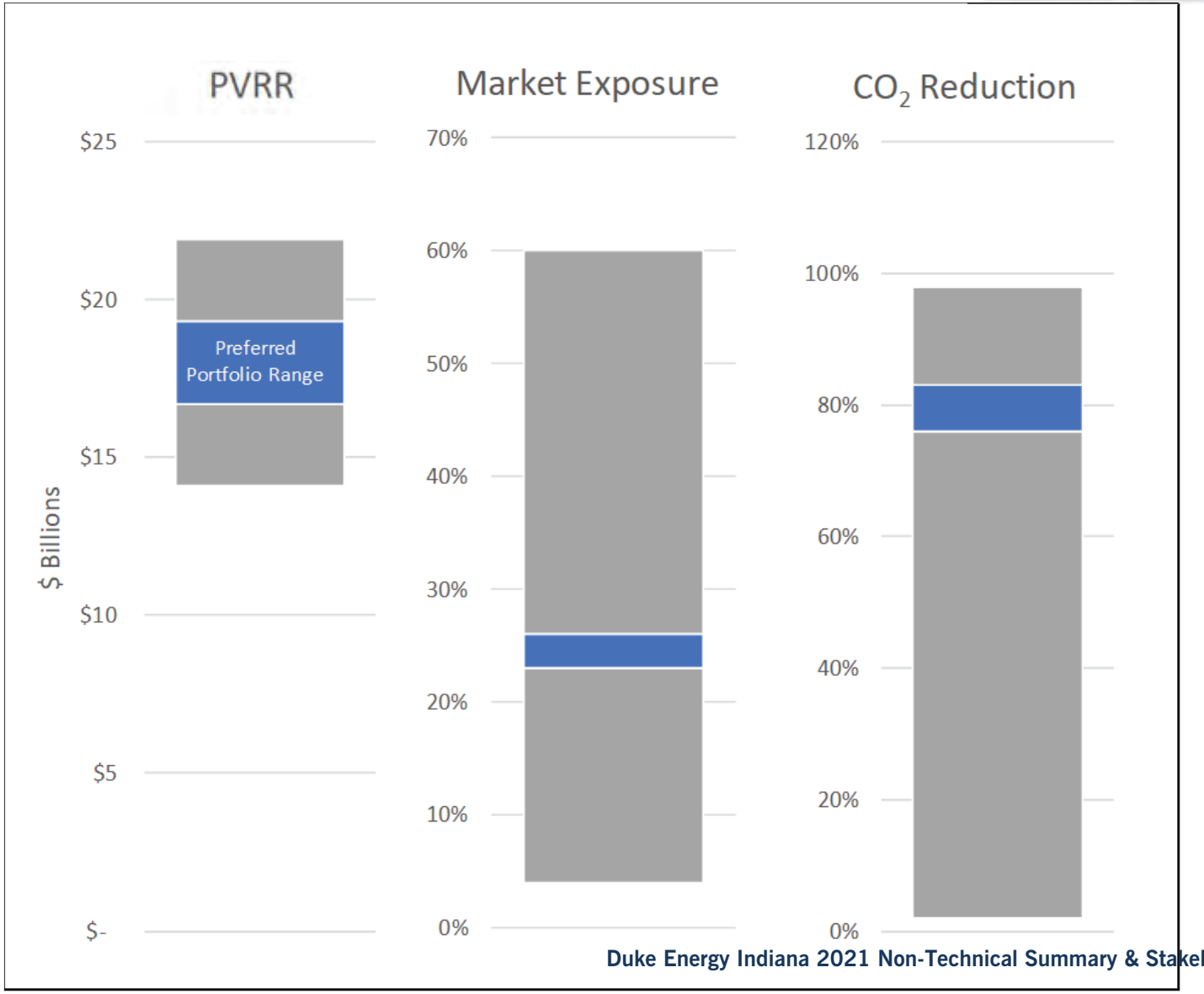
Preferred Portfolio

The Renewables/CC/CT portfolio was selected as the preferred portfolio for the 2021 DEI IRP

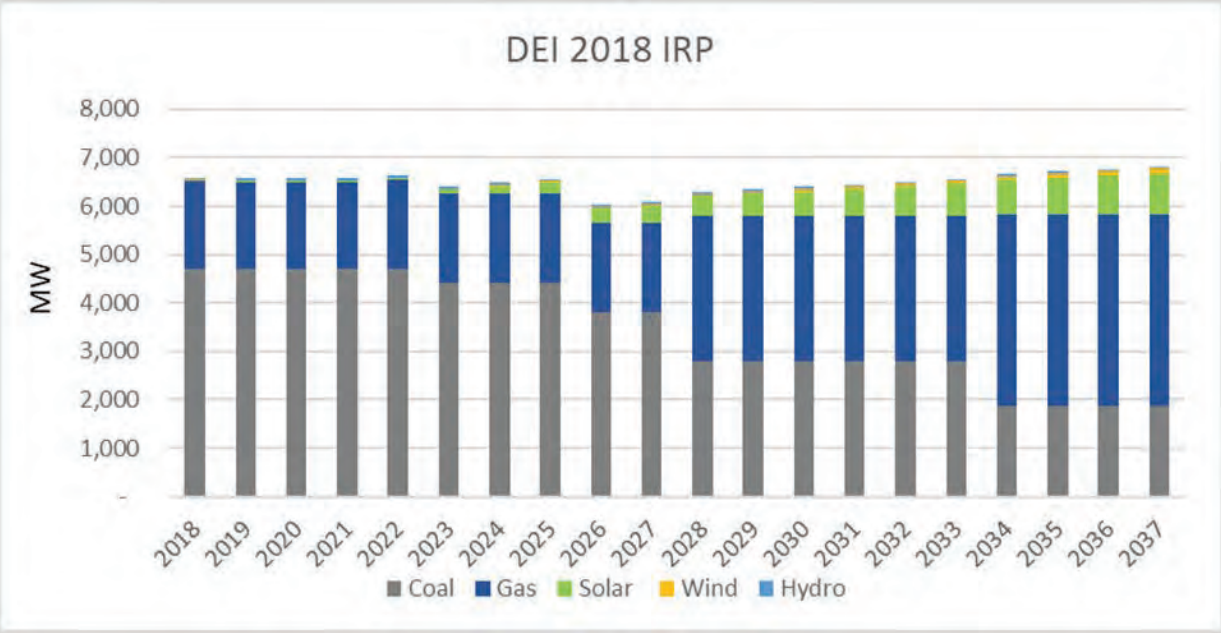
Preferred Portfolio	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005														
Edwardsport IGCC	618	618	618	618	618	618	618	618	618	618	618	618	618	618						
Edwardsport CC															586	586	586	586	586	586
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270						
Gibson 3	635	635	635	635	635	635	635	635												
Gibson 4	627	627	627	627	627	627	627	627												
Gibson 5	313	313	313	313																
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR																				
CC 1							1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
CC 2 & 3																				
Capacity PPAs	50	250	450																	
CT															1,160	1,160	1,160	1,160	1,160	1,160
EE	53	85	119	151	178	207	248	266	288	308	326	336	346	353	368	361	352	345	342	338
DR	497	507	512	607	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613
Solar	47	47	197	447	647	847	1,047	1,247	1,497	1,547	1,697	1,847	1,997	2,147	2,297	2,447	2,575	2,725	2,875	3,025
Solar & Storage							75	150	225	300	450	525	600	675	900	975	1,125	1,275	1,425	1,500
Wind (incl Benton)	100	100	100	100	100	100	100	100	100	200	400	600	900	1,200	1,500	1,800	2,100	2,400	2,600	2,800
Storage																				

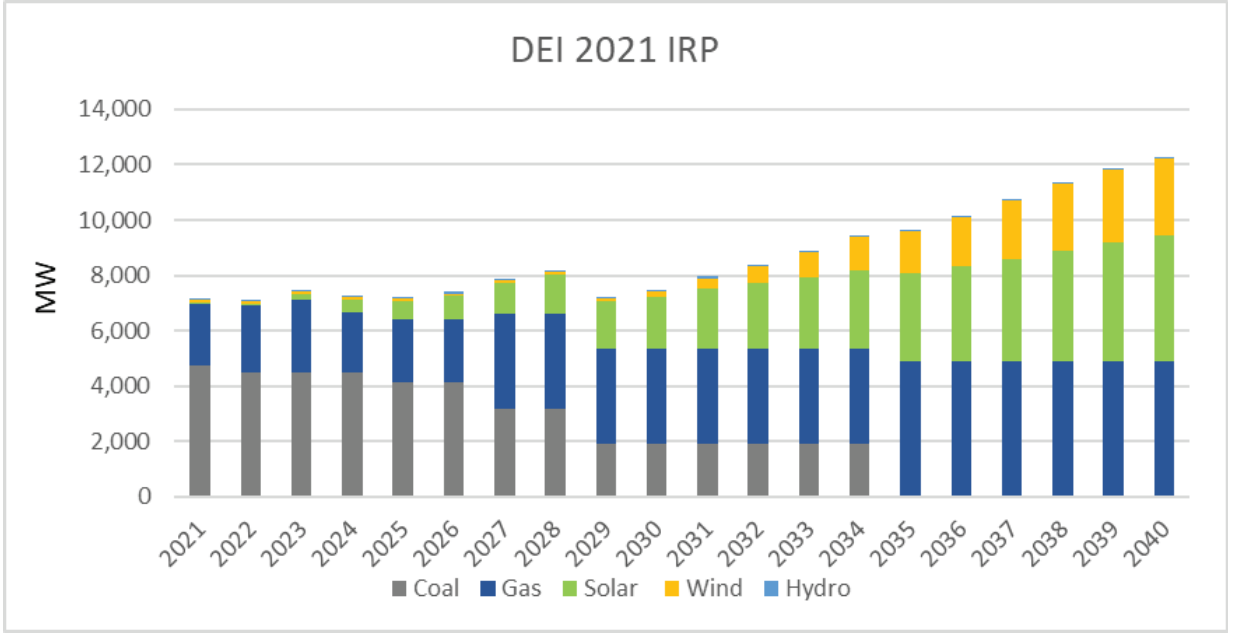
Note- Table shows ICAP MW for each resource by year

Preferred Portfolio Performance



Comparison of 2018 & 2021 IRP





Preferred Portfolio Highlights

Performance Metric	Highlight
Near term rate impact	Averages 1.3% CAGR over 5 years
Long term costs	Transitions portfolio at a reasonable cost
CO_2 reduction	Reduces CO_2 emissions vs 2005 baseline 53% in 2030 and 83% in 2040
Reliance on market	Averages 19% of energy needs coming from the market across all years and scenarios (Historically 20%-25%)
Resource diversity	Increases generation fleet diversity (HHI in 2021 = 36%; HHI in 2030 = 17%)

DUKE ENERGY

Closing Comments, Stakeholder Comments

Wrap Up

- Introduction of Duke Energy Indiana's Independent 3rd Party Administrator for its upcoming RFP for generation
- Meeting Survey
- Comments can also be sent to:
  - Scott at: scott.park@duke-energy.com
  - Stewart at: stewart@vanry.com

- Meeting summary and other materials will be posted on website by Nov 3
  - https://www.duke-energy.com/home/products/in-2021-irp-stakeholder

APPENDIX

Acronyms

AMI	Advanced Metering Infrastructure
CHP	Combined Heat & Power
CPP	Critical Peak Pricing
CS	Small Commercial
DR	Demand Response
DER	Distributed Energy Resource
DEI	Duke Energy Indiana
DSM	Demand Side Mgt (EE + DR)
EV	Electric Vehicles
EE	Energy Efficiency
EIA	Energy Information Administration
ELCC	Effective Load Carrying Capability
IURC	Indiana Utility Regulatory Commission
IRP	Integrated Resource Plan
LBNL	Lawrence Berkeley National Lab
LMI	Low-Medium Income
MW	Megawatt
NEM	Net Energy Metering
NDA	Non-disclosure agreement
PPA	Purchase Power Agreement
PVRR	Present Value of Revenue Requirements
RFI	Request for Information
RS	Residential Standard
RE	Residential Electric
TOU	Time of Use
TOUD	Time of Use with Demand
T&D	Transmission and Distribution
UCAP	Unforced Capacity
UPC	Usage per Customer
VPP	Variable Peak Pricing
VPPD	Variable Peak Pricing with Demand

Resource Definitions

- Battery/Storage - Four (4) hour battery storage
- Capacity PPA (Capacity purchase power agreement) - Near term capacity needed to meet forecasted reserve margin requirements. Could be place holder for capacity only purchase or purchases of power or existing assets coming out of request for proposals (RFP). Could be renewable or conventional.
- CC (Natural Gas Combined Cycle) - Options include Class F and Class J
- CT - Natural Gas Combustion Turbine
- CT H2 –Natural Gas Combustion Turbine using Hydrogen as fuel
- Edwardsport IGCC – Edwardsport with gasifiers running primarily on coal
- Edwardsport CC – Edwardsport with natural gas only operations
- Solar – Utility scale solar
- Solar + Storage - Solar plus 4-hour battery storage
- Wind – Utility scale wind
- DR– Demand Side Management Demand Response
- EE - Energy Efficiency
- ZELFR – Zero Emitting Load Following Resources. Placeholder for future technology of this type. Modeling using estimated nuclear small modular reactor (SMR) costs. Could be any future technology that is non-emitting such as Hydrogen CC, CC with CUS, SMR, Advanced Nuclear, etc.

Scorecard Notes

	Reliability			Resilience / Stability			Affordability		Environmental Sustainability			Portfolio Flexibility
METRIC	Dispatchable Resources as a percentage of load[1]	Can portfolio serve load in all years of IRP planning period?[2]	Average percentage of annual market purchases[3]	Diversity of Resources as measured by HHI[4]	Challenges in executing portfolio[5]	Can portfolio mix serve load in extreme weather weeks in PST?[6]	Average of portfolio PVRRs across scenarios[7]	5 year CAGR of rates in Ref Scenario w/o CO_2[8]	2040 CO_2 Reduction % and Avg Annual Tons Emitted[9]	On track for meeting Duke Energy Climate Goals?[10]	SO_2, Nox, PM & Water Emissions[11]	Range of PVRRs across scenarios[12]
	Higher better	<0.5% Acceptable	<20-25% preferred	Lower better			Lower better	Lower better	Greater reduction better			Smaller better

Notes

1 (Coal, Gas & Battery MW in 2030) / (Total MW in 2030)
2 Average of Energy Not Served / Total Energy for all years in all scenarios (<.5% due to outages in model)
3 Average of market purchases for all years in all scenarios
4 HHI is a concentration index calculated by adding each resource's percentage of mix squared
5 Greater construction levels through 2030 drive this metric
6 Applies 2030 portfolio mix to extreme weather weeks in PST
7 Averages PVRRS across all scenarios
8 Average 5 year rate impact due to generation choices
9 CO2 reduction relative to 2005 and includes CO2 associated with market purchases
10 Are the 2040 CO2 emissions of a portfolio less than a linear interpolation between 2005 actuals and 0 in 2050
11 Composite of pollutants and water consumption based on 2030 portfolio performance
12 (Max PVRR - Min PVRR) for a portfolio across all scenarios

DUKE ENERGY

Optimized Portfolio for Ref w/o CO_2 Reg

OPT REF w/o CO_2 Reg	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005														
Edwardsport IGCC	618	618																		
Edwardsport CC			586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270
Gibson 3	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635
Gibson 4	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627
Gibson 5	313	313	313	313	313	313														
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR																				
CC 1							1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
CC 2 & 3																				
Capacity PPAs	50	250	400																	
CT			232	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232
EE	53	85	119	151	178	207	248	266	288	308	326	336	346	353	368	361	352	345	342	338
DR	497	507	512	607	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613
Solar	47	47	47	247	247	247	247	247	247	247	247	247	247	247	447	597	675	875	925	1,125
Solar & Storage																				
Wind (incl Benton)	100	100	100	100	100	100	100												50	50
Storage																				

Note- Table shows ICAP MW for each resource by year

Optimized Portfolio for Ref w/ CO_2 Reg

Opt Ref w/ CO_2 Reg	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005														
Edwardsport IGCC	618	618																		
Edwardsport CC			586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	635	635	635	635										
Gibson 3	635	635	635	635	635	635	635													
Gibson 4	627	627	627	627	627	627														
Gibson 5	313	313	313	313																
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR																				
CC 1							1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
CC 2 & 3							1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
Capacity PPAs	50	250	450																	
CT			232	232	232	232	232	232	232	232	232	232	232	232	232	464	464	464	464	464
EE	53	85	119	151	178	207	249	268	292	315	334	345	355	363	379	372	362	354	351	346
DR	497	507	512	533	538	538	538	538	538	538	538	538	538	538	538	538	538	538	538	538
Solar	47	47	147	547	547	547	547	547	747	1,097	1,497	1,897	2,297	2,697	2,897	3,097	3,275	3,475	3,675	3,875
Solar & Storage											75	75	75	75	75	75	75	75	75	75
Wind (incl Benton)	100	100	100	100	100	100	100		100	300	500	700	900	1,100	1,300	1,500	1,700	1,900	2,100	2,300
Storage																				

Note- Table shows ICAP MW for each resource by year

Optimized Portfolio for High Gas Scenario

HIGH GAS	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005
Edwardsport IGCC	618	618																		
Edwardsport CC			586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270
Gibson 3	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635
Gibson 4	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627
Gibson 5	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR																				
CC 1																				
CC 2 & 3																				
Capacity PPAs	50	250	400																	
CT			232	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232
EE	53	85	119	151	178	207	248	266	288	308	326	336	346	353	368	361	352	345	342	338
DR	497	507	512	607	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613
Solar	47	47	47	147	147	147	147	147	147	147	297	297	397	597	797	847	975	1,075	1,325	1,525
Solar & Storage				75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Wind (incl Benton)	100	100	100	100	100	100	100					200	400	600	800	1,000	1,200	1,400	1,600	1,800
Storage																				

Note- Table shows ICAP MW for each resource by year

Optimized Portfolio for Low Gas Scenario

LOW GAS	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005														
Edwardsport IGCC	618	618																		
Edwardsport CC			586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270												
Gibson 3	635	635	635	635	635	635														
Gibson 4	627	627	627	627	627	627														
Gibson 5	313	313	313	313	313															
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR																				
CC 1							1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
CC 2 & 3							1,221	1,221	2,442	2,442	2,442	2,442	2,442	2,442	2,442	2,442	2,442	2,442	2,442	2,442
Capacity PPAs	50	250	400																	
CT			232	464	464	464	464	464	464	464	464	464	464	464	464	696	696	696	928	928
EE	53	85	119	151	178	207	248	266	288	308	326	336	346	353	368	361	352	345	342	338
DR	497	507	512	533	538	538	538	538	538	538	538	538	538	538	538	538	538	538	538	538
Solar	47	47	47	47	47	47	47	47	47	47	47	47	47	197	197	197	175	175	175	175
Solar & Storage																				
Wind (incl Benton)	100	100	100	100	100	100	100											50	50	50
Storage																				

Note- Table shows ICAP MW for each resource by year

Balanced Portfolio

Balanced Hybrid	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005														
Edwardsport IGCC	618	618	618	618	618	618	618	618	618	618	618	618	618	618	618	618	618	618	618	618
Edwardsport CC																				
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270
Gibson 3	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635
Gibson 4	627	627	627	627	627	627														
Gibson 5	313	313	313	313	313	313														
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR																				
CC 1			815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815
CC 2 & 3							1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
Capacity PPAs	50	250																		
CT																				
EE	53	85	119	151	178	207	248	266	288	308	326	336	346	353	368	361	352	345	342	338
DR	497	507	512	607	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613
Solar	47	47	247	497	497	497	497	497	497	697	797	947	1,047	1,297	1,297	1,397	1,425	1,525	1,675	1,775
Solar & Storage											75	150	225	300	375	450	525	600	675	750
Wind (incl Benton)	100	100	100	150	150	150	150	50	50	150	250	350	450	550	600	800	900	1,000	1,100	1,200
Storage																				

Note- Table shows ICAP MW for each resource by year

Renewables/CC Portfolio

Renewable-CC Portfolio	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005														
Edwardsport IGCC	618	618	618	618	618	618	618	618	618	618	618	618	618	618						
Edwardsport CC															541	541	541	541	541	541
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270						
Gibson 3	635	635	635	635	635	635	635	635	635											
Gibson 4	627	627	627	627																
Gibson 5	313	313	313	313																
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR															878	878	878	878	878	878
CC 1					815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815
CC 2 & 3							1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
Capacity PPAs	50	250	500																	
CT																				
EE	53	85	119	151	178	207	249	268	292	315	334	345	355	363	380	374	365	358	355	351
DR	497	507	512	607	613	613	613	613	613	721	721	721	721	721	721	721	721	721	721	721
Solar	47	147	347	547	747	947	1,147	1,347	1,547	1,747	1,947	2,147	2,347	2,547	2,747	2,947	3,125	3,325	3,525	3,725
Solar & Storage																				
Wind (incl Benton)	100	100	200	300	400	500	600	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700	1,800
Storage																				

Note- Table shows ICAP MW for each resource by year

Renewables/CC/CT Portfolio

Ren/CC/CT Hyrbid Port	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005														
Edwardsport IGCC	618	618	618	618	618	618	618	618	618	618	618	618	618	618						
Edwardsport CC															586	586	586	586	586	586
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270						
Gibson 3	635	635	635	635	635	635	635	635												
Gibson 4	627	627	627	627	627	627	627	627												
Gibson 5	313	313	313	313																
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR																				
CC 1							1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
CC 2 & 3																				
Capacity PPAs	50	250	450																	
CT															1,160	1,160	1,160	1,160	1,160	1,160
EE	53	85	119	151	178	207	248	266	288	308	326	336	346	353	368	361	352	345	342	338
DR	497	507	512	607	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613
Solar	47	47	197	447	647	847	1,047	1,247	1,497	1,547	1,697	1,847	1,997	2,147	2,297	2,447	2,575	2,725	2,875	3,025
Solar & Storage							75	150	225	300	450	525	600	675	900	975	1,125	1,275	1,425	1,500
Wind (incl Benton)	100	100	100	100	100	100	100	100	100	200	400	600	900	1,200	1,500	1,800	2,100	2,400	2,600	2,800
Storage																				

Note- Table shows ICAP MW for each resource by year

Renewables/CT Portfolio

Renewable-CT Portfolio	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005														
Edwardsport IGCC	618	618	618	618	618	618	618	618	618	618	618	618	618	618						
Edwardsport CC															586	586	586	586	586	586
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270						
Gibson 3	635	635	635	635	635	635	635	635	635											
Gibson 4	627	627	627	627																
Gibson 5	313	313	313	313																
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR															878	878	878	878	878	878
CC 1			815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815
CC 2 & 3																				
Capacity PPAs	50	200																		
CT							1,392	1,392	1,392	1,392	1,392	1,392	1,392	1,392	1,392	1,392	1,392	1,392	1,392	1,392
EE	53	85	119	151	178	207	249	268	292	315	334	345	355	363	380	374	365	358	355	351
DR	497	507	512	607	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613	613
Solar	47	147	347	547	747	947	1,147	1,347	1,547	1,747	1,947	2,147	2,347	2,547	2,747	2,947	3,125	3,325	3,525	3,725
Solar & Storage											75	150	225	300	375	450	525	600	675	750
Wind (incl Benton)	100	100	200	300	400	500	600	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700	1,800
Storage																				

Note- Table shows ICAP MW for each resource by year

Biden 100 Portfolio

Biden 100 Portfolio	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	505	505	505	505													
Edwardsport IGCC	618	618																		
Edwardsport CC																				
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	635	635								
Gibson 3	635	635	635	635	635	635	635	635	635	635										
Gibson 4	627	627	627	627	627	627														
Gibson 5	313	313	313	313	313	313														
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR													1,317	1,756	2,634	2,634	2,634	2,634	2,634	2,634
CC 1			815	815	815	815	815	815	815	815	815	815	815	815						
CC 2 & 3																				
Capacity PPAs	50	250																		
CT											464	928	928	928	1,392	1,624	1,624	1,624	1,624	1,624
EE	53	85	119	154	184	216	260	280	303	324	343	353	364	371	387	379	369	361	358	354
DR	497	507	512	931	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937
Solar	47	347	347	347	1,247	1,247	1,247	1,597	2,347	3,047	3,047	3,047	3,047	3,047	3,047	3,047	3,025	3,025	3,025	3,025
Solar & Storage											150	150	150	150	150	150	150	150	225	225
Wind (incl Benton)	100	100	100	100	100	500	1,100	1,600	2,000	2,500	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700
Storage										250	750	1,050	1,050	1,150	1,500	1,500	1,500	1,500	1,500	1,550

Note- Table shows ICAP MW for each resource by year

Biden 90 Portfolio

Biden 90 Portfolio	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	505	505	505	505													
Edwardsport IGCC	618	618																		
Edwardsport CC																				
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	635	635	635	635						
Gibson 3	635	635	635	635	635	635	635													
Gibson 4	627	627	627	627	627	627	627	627	627	627										
Gibson 5	313	313	313	313	313	313														
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR													878	1,317	1,756	1,756	1,756	1,756	1,756	1,756
CC 1			815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815	815
CC 2 & 3																				
Capacity PPAs	50	250																		
CT											464	696	696	696	928	1,160	1,160	1,160	1,160	1,160
EE	53	85	119	154	184	216	260	280	303	324	343	353	364	371	387	379	369	361	358	354
DR	497	507	512	931	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937
Solar	47	247	247	247	1,097	1,097	1,097	1,547	2,147	2,997	3,047	3,047	3,047	3,047	3,047	3,047	3,025	3,025	3,025	3,025
Solar & Storage												75	75	75	300	375	375	600	600	600
Wind (incl Benton)	100	100	100	100	150	400	950	1,400	1,800	2,150	2,700	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,850	2,850
Storage										200	700	850	850	1,050	1,400	1,400	1,400	1,400	1,400	1,450

Note- Table shows ICAP MW for each resource by year

Environmentally Focused Portfolio

Enviro Focused Portfolio	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005	1,005													
Edwardsport IGCC	618	618																		
Edwardsport CC			586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270											
Gibson 3	635	635	635	635	635	635	635	635												
Gibson 4	627	627	627	627	627	627	627	627												
Gibson 5	313	313	313	313	313	313														
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR																				
CC 1																				
CC 2 & 3																				
Capacity PPAs	50	250	500																	
CT																				
EE	53	85	119	151	178	207	249	269	293	315	335	346	356	364	381	375	366	359	356	353
DR	497	507	512	715	721	721	721	721	721	937	937	937	937	937	937	937	937	937	937	937
Solar	47	47	247	447	447	447	447	747	1,147	1,547	1,797	1,997	2,197	2,397	2,597	2,797	2,975	3,175	3,375	3,575
Solar & Storage				75	75	75	75	150	150	525	525	525	525	525	525	525	525	525	525	525
Wind (incl Benton)	100	100	100	100	100	100	300	400	600	800	1,000	1,200	1,400	1,600	1,800	1,950	2,100	2,200	2,300	2,400
Storage						100	600	1,100	1,600	2,100	2,100	2,100	2,100	2,150	2,600	2,650	2,650	2,650	2,850	2,900

Note- Table shows ICAP MW for each resource by year

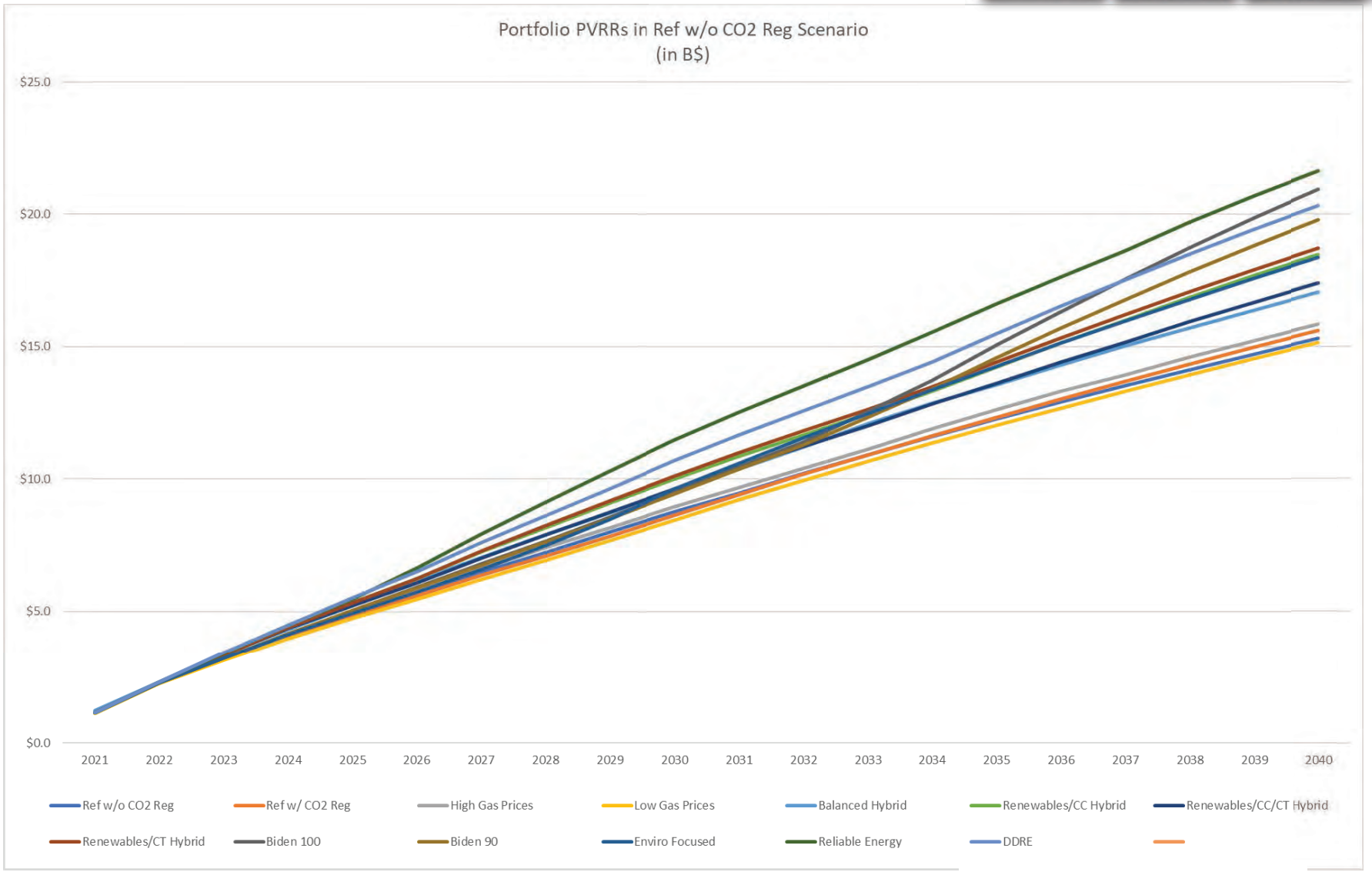
Reliable Energy Portfolio

Carbon Capture and Sequestration added

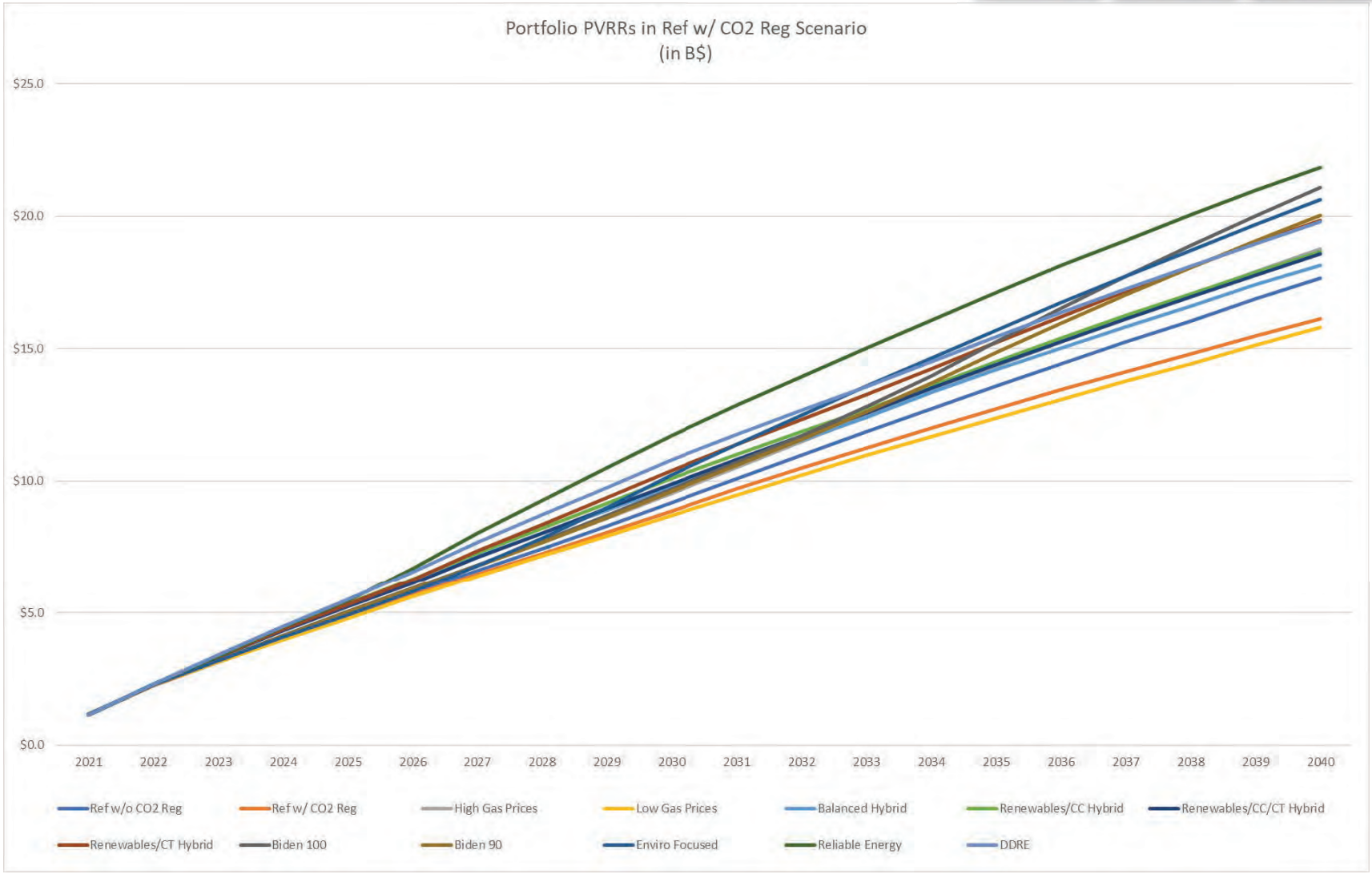
Reliable Energy Portfolio	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Cayuga 1&2	1,005	1,005	1,005	1,005	1,005	1,005														
Edwardsport IGCC	618	618	618	618	618	429	429	429	429	429	429	429	429	429	429	429	429	429	429	429
Edwardsport CC																				
Gibson 1&2	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	1,270	635	635	635	635	635	635
Gibson 3	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635			
Gibson 4	627	627	627	627	627	627	627	627	627											
Gibson 5	313	313	313	313	313	313	313	313	313											
Noble CC	310	310	310	310	310	310	310	310	310	310	310	310	310	310						
ZELFR															878	878	878	1,317	1,317	1,317
CC 1																				
CC 2 & 3							1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
Capacity PPAs	50	50	50																	
CT																			232	232
EE	53	85	119	154	184	216	260	279	303	324	342	353	363	370	386	378	368	360	357	353
DR	497	507	512	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Solar	47	397	797	1,197	1,597	1,997	2,397	2,797	3,197	3,597	3,997	4,397	4,797	5,197	5,597	5,997	6,375	6,775	6,875	6,875
Solar & Storage																				
Wind (incl Benton)	100	100	100	300	500	700	900	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,000	3,000
Storage																				

Note- Table shows ICAP MW for each resource by year

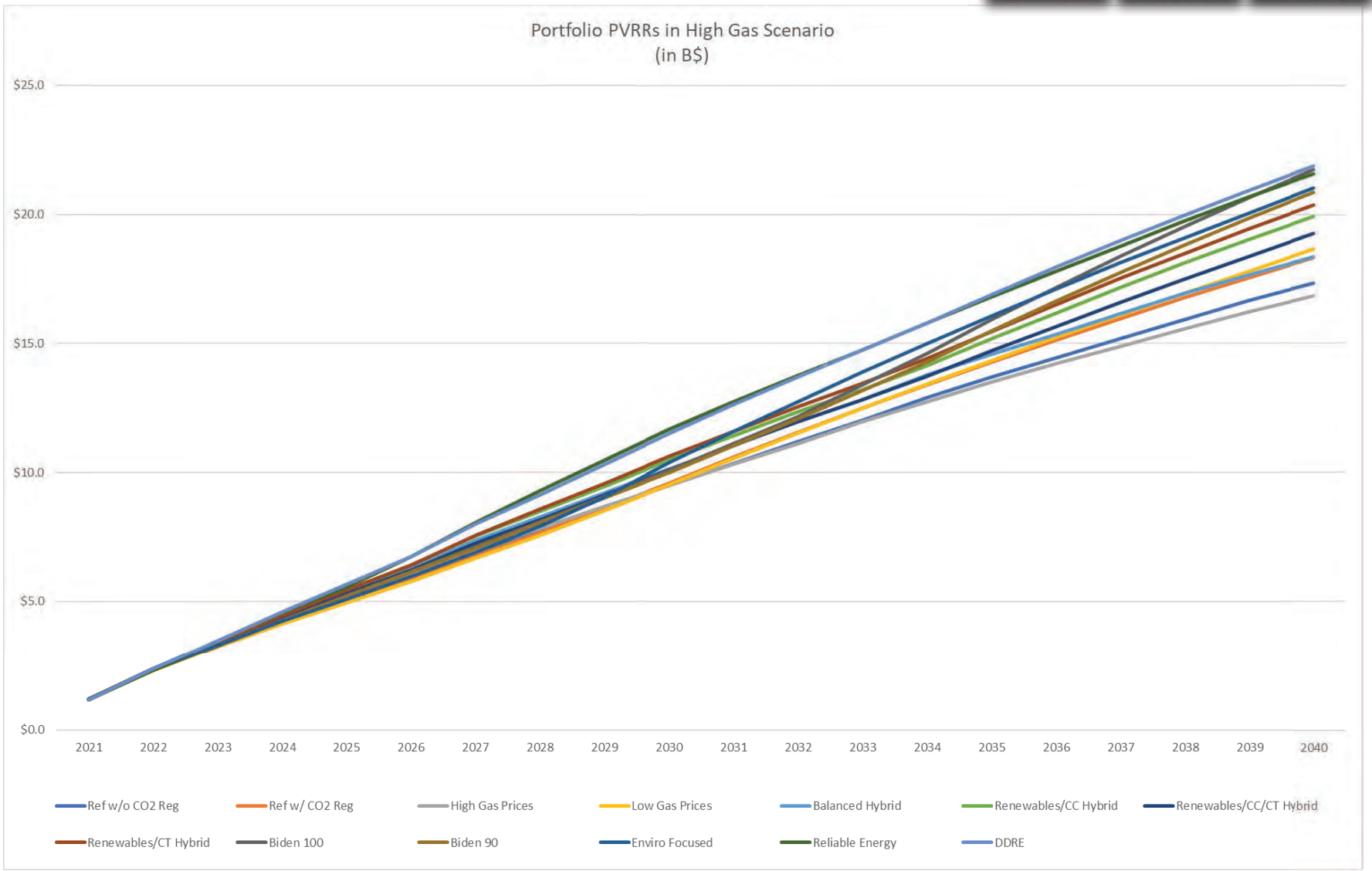
PVRR in Ref w/o CO_2 Reg



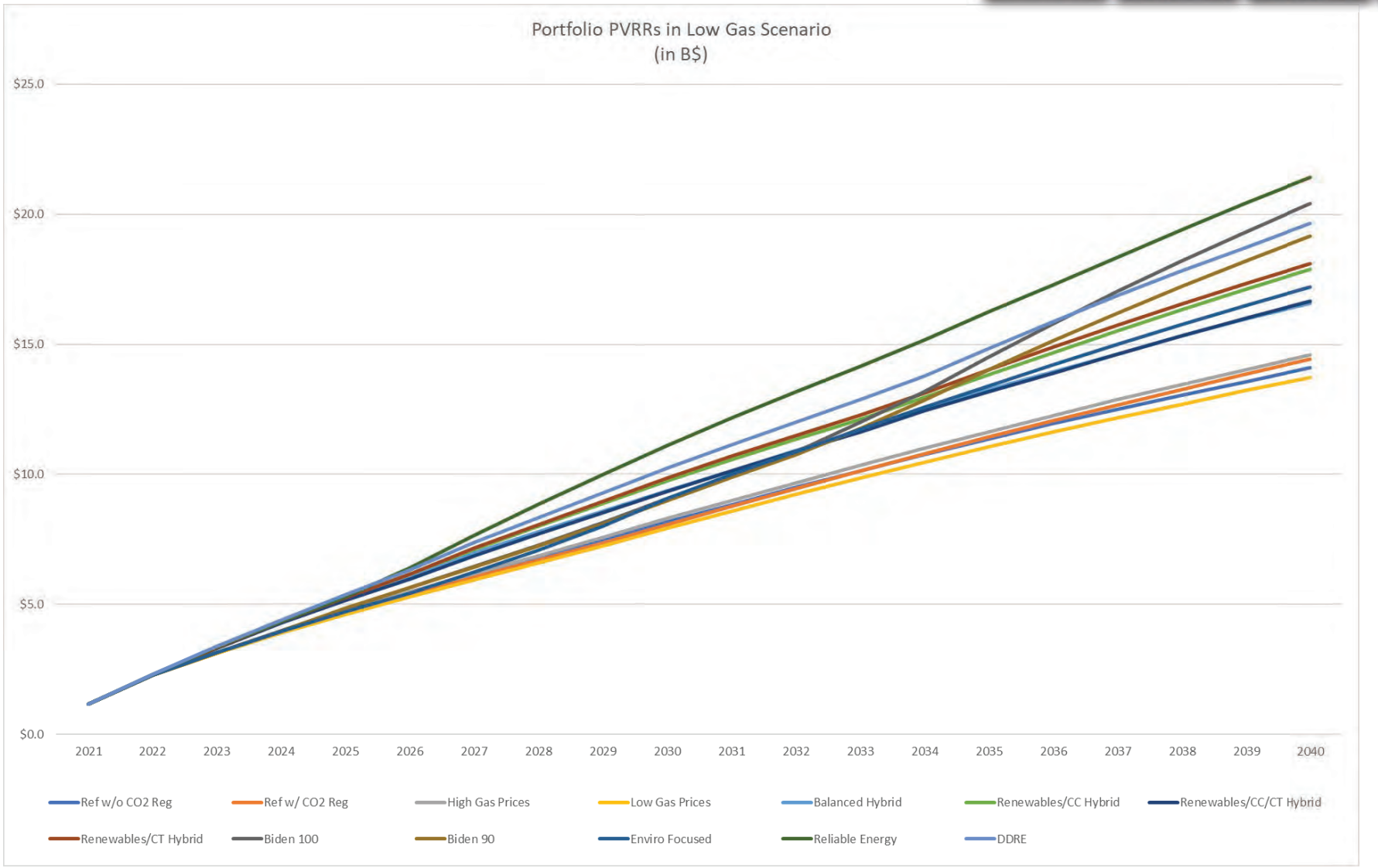
PVRR in Ref w/ CO_2 Reg



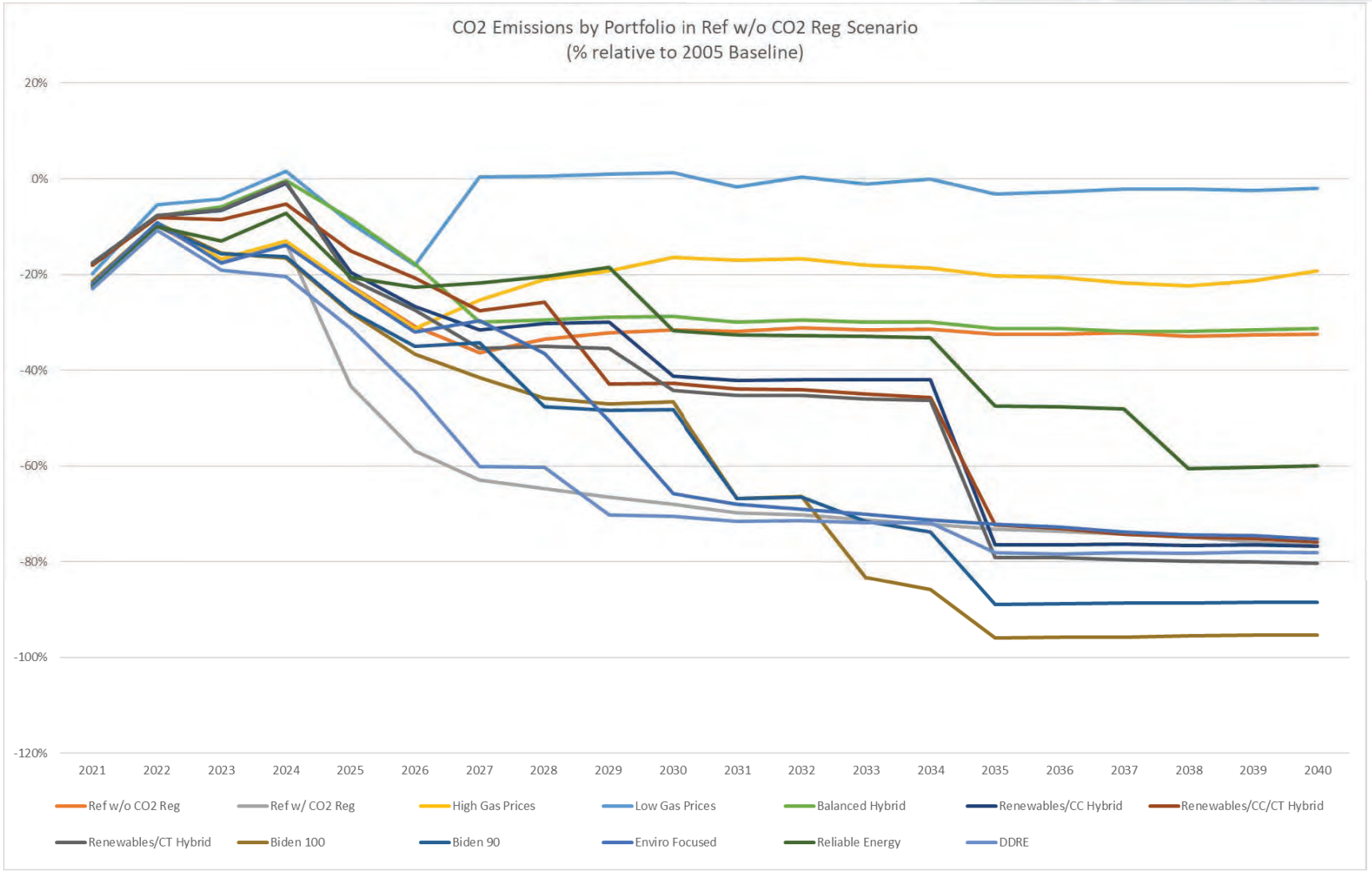
PVRR in High Gas Scenario



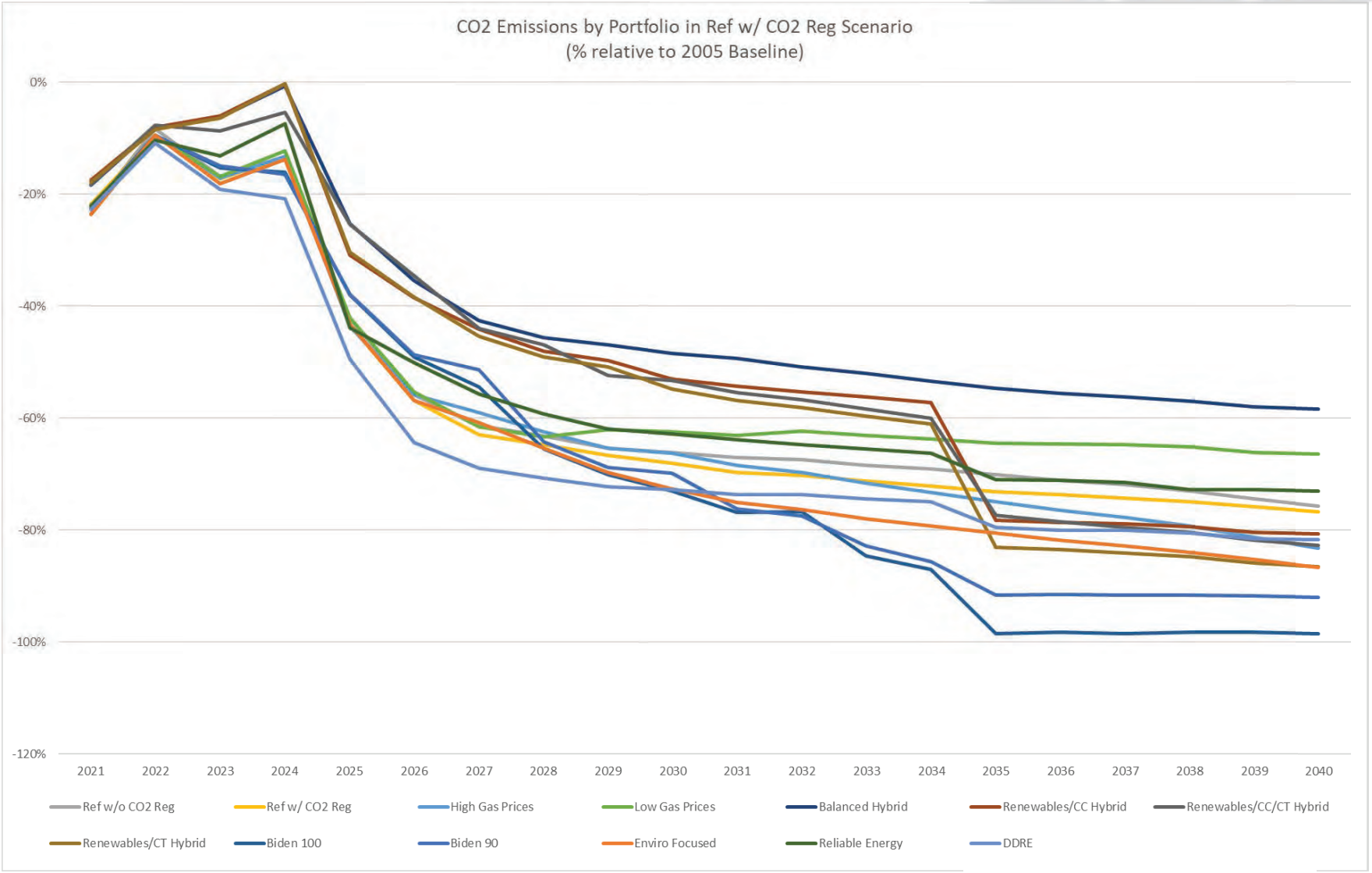
PVRR in Low Gas Scenario



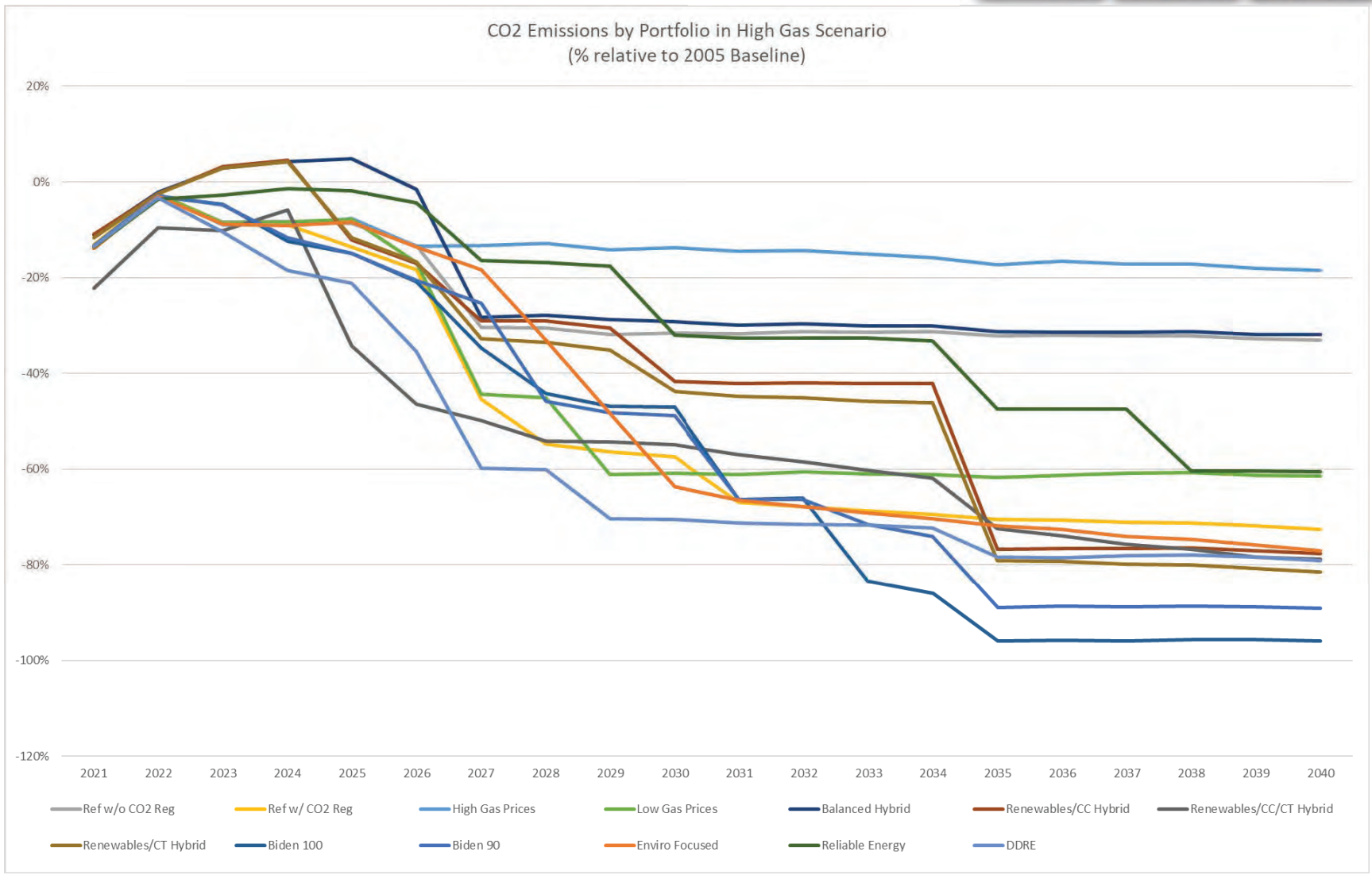
CO_2 Emissions in Ref w/o CO_2 Reg



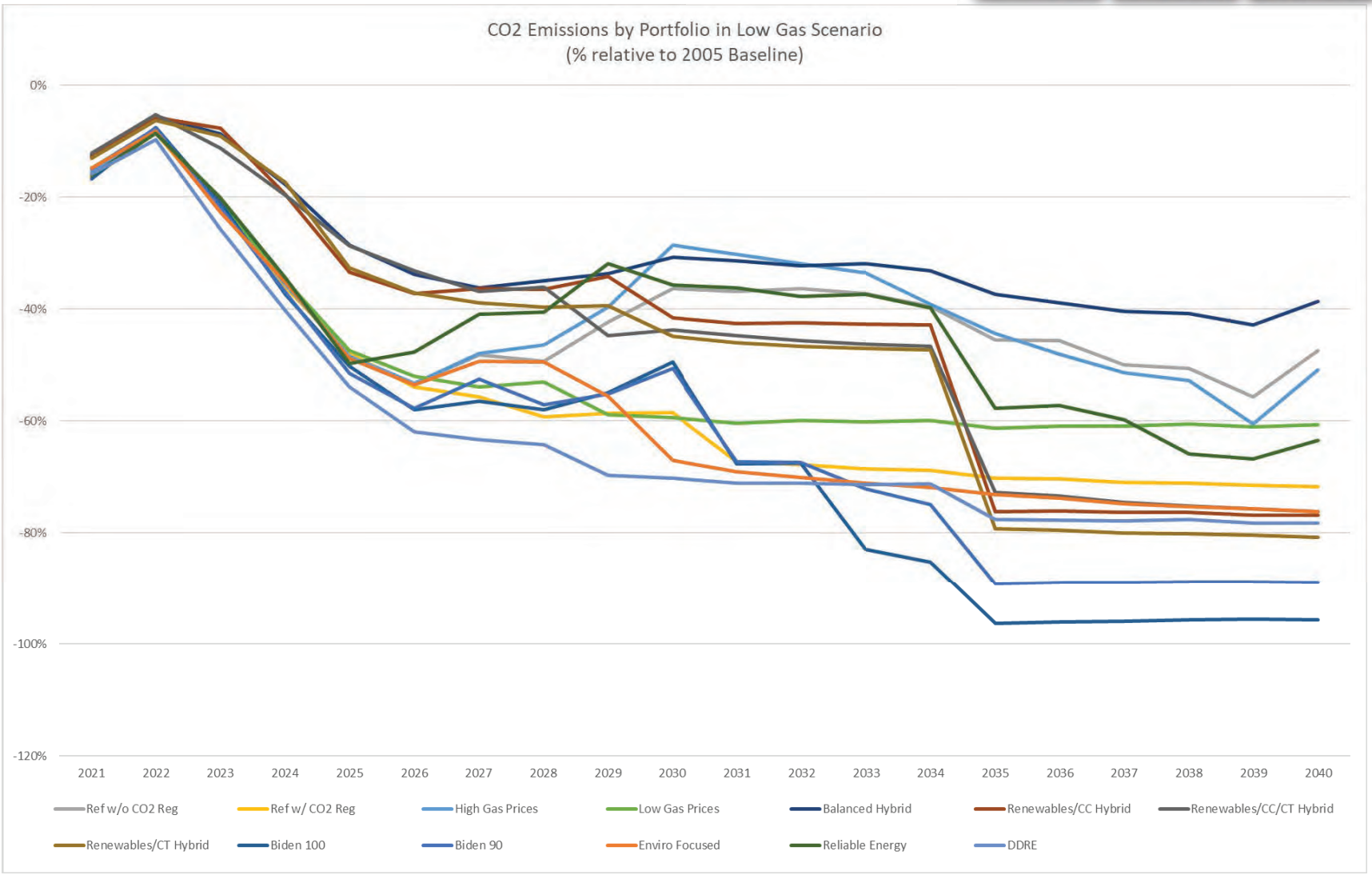
CO_2 Emissions in Ref w/ CO_2 Reg



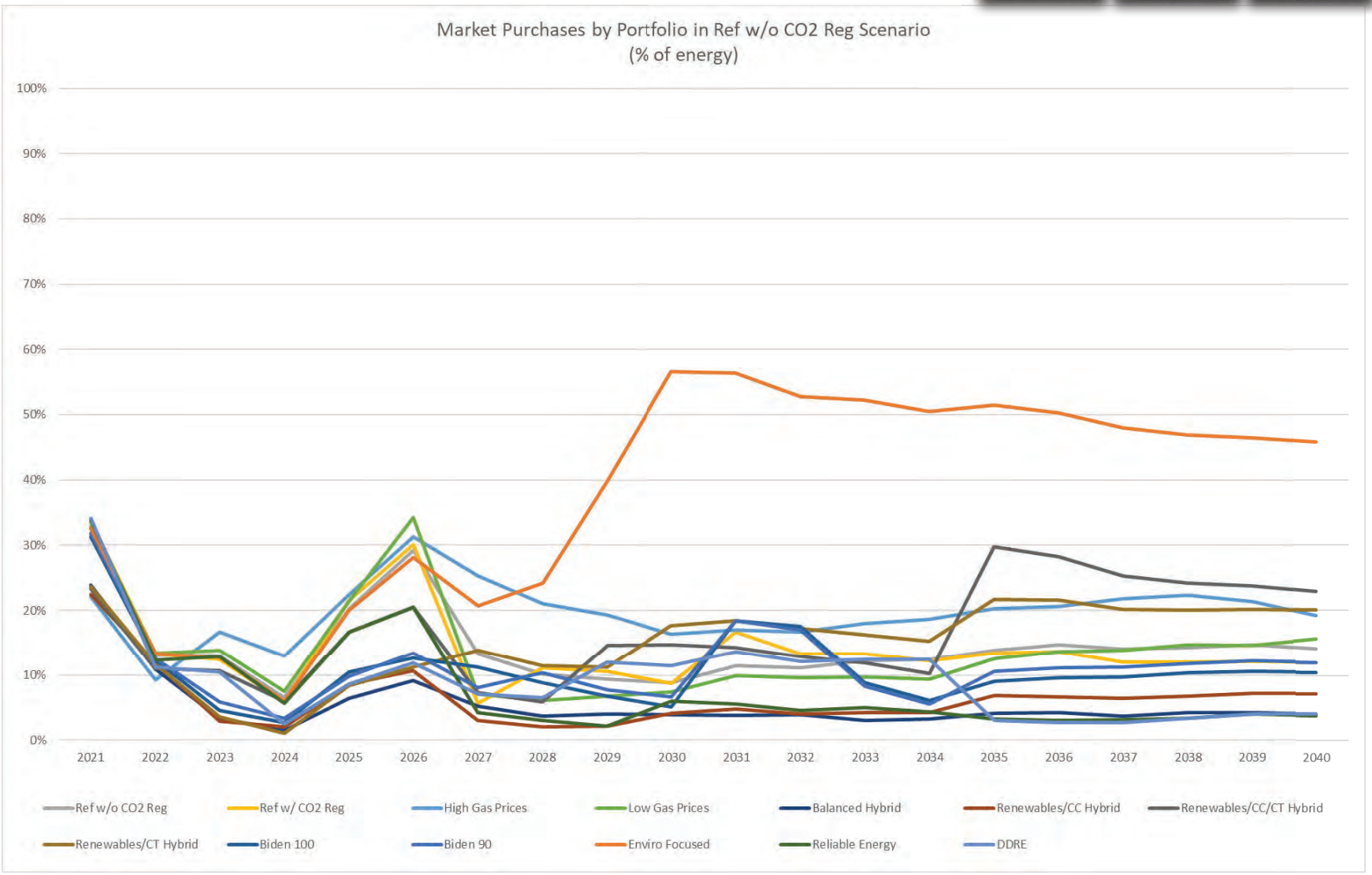
CO_2 Emissions in High Gas Scenario



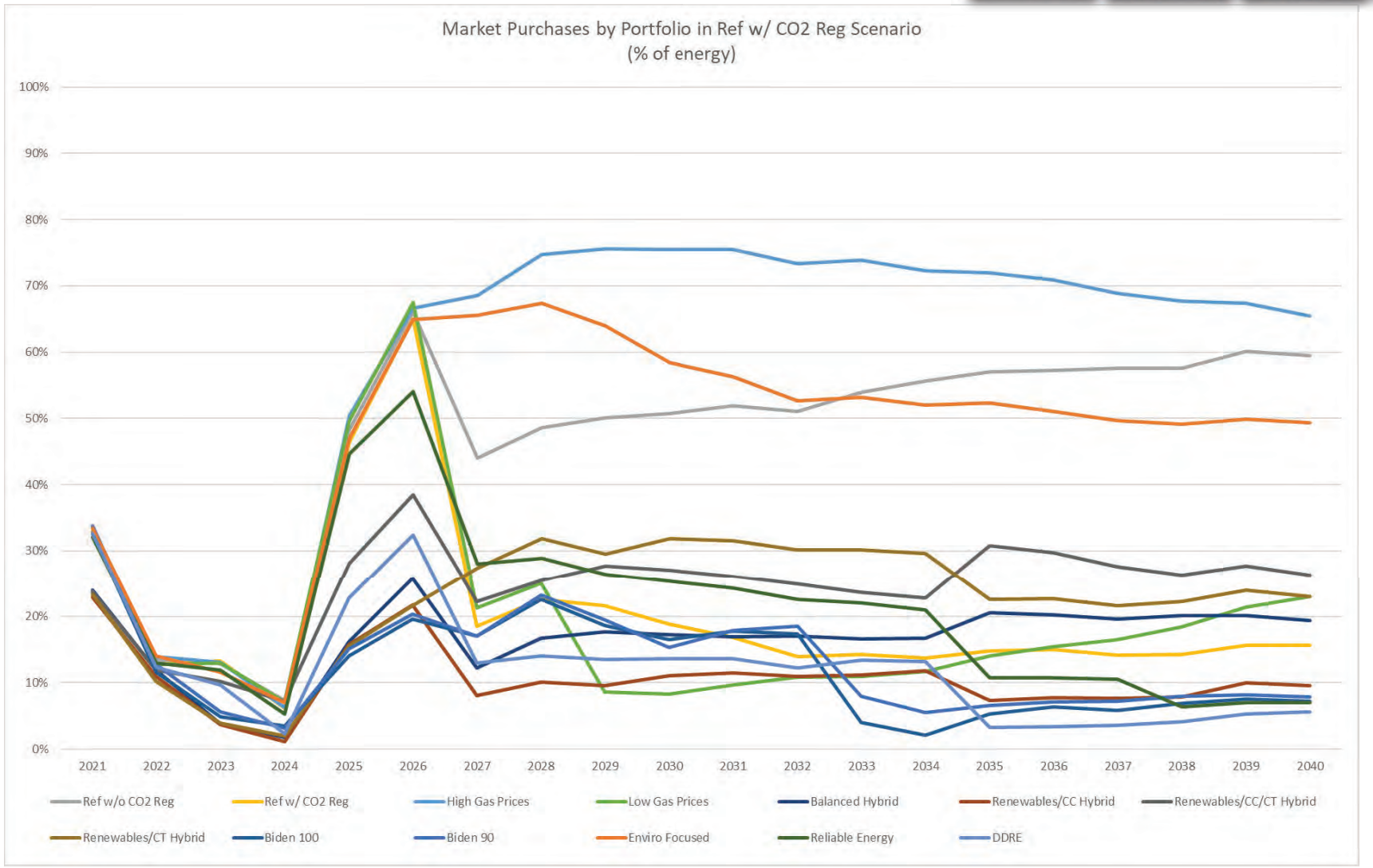
CO_2 Emissions in Low Gas Scenario



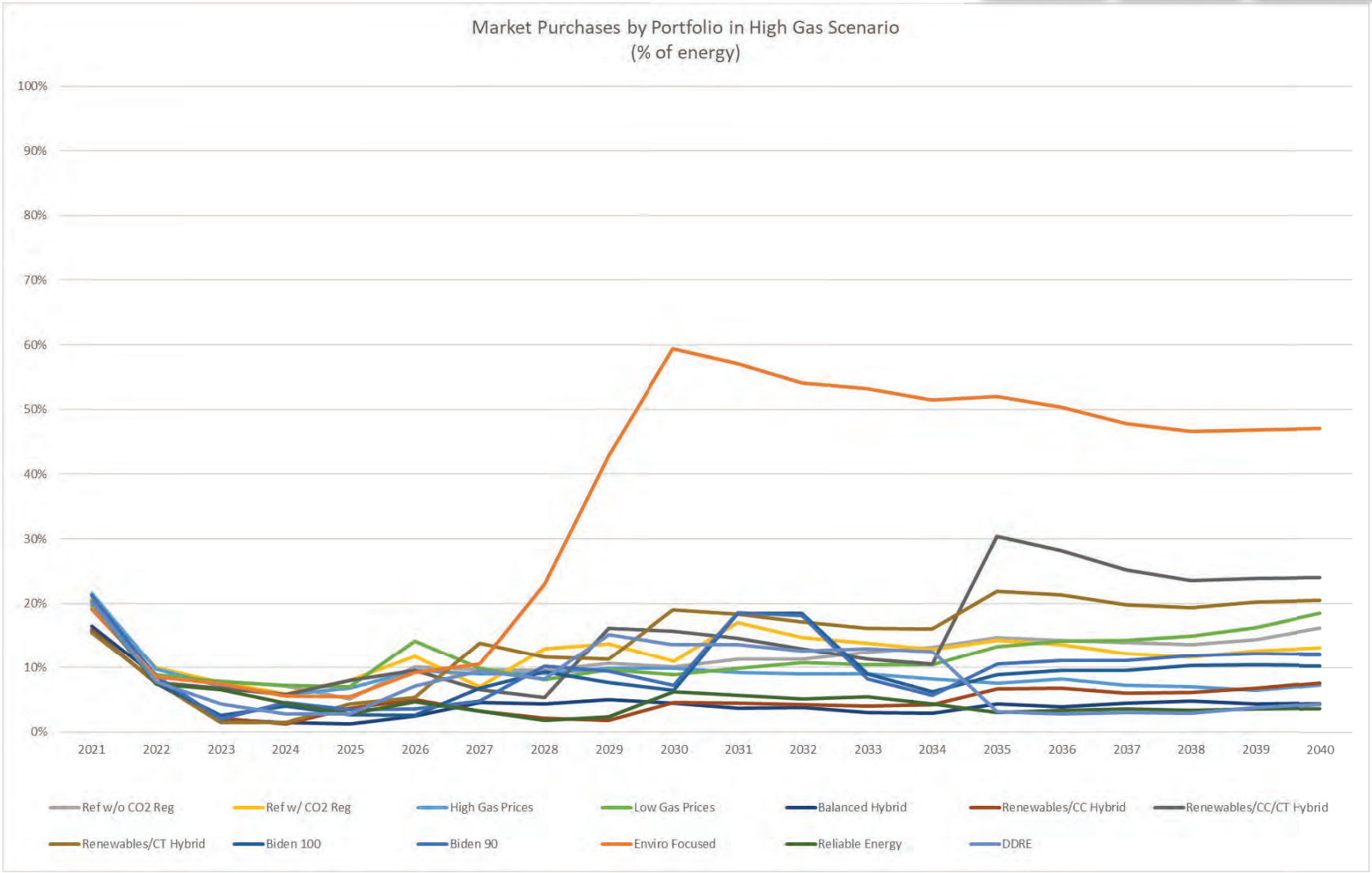
Market Purchases in Ref w/o CO_2 Reg (% of energy)



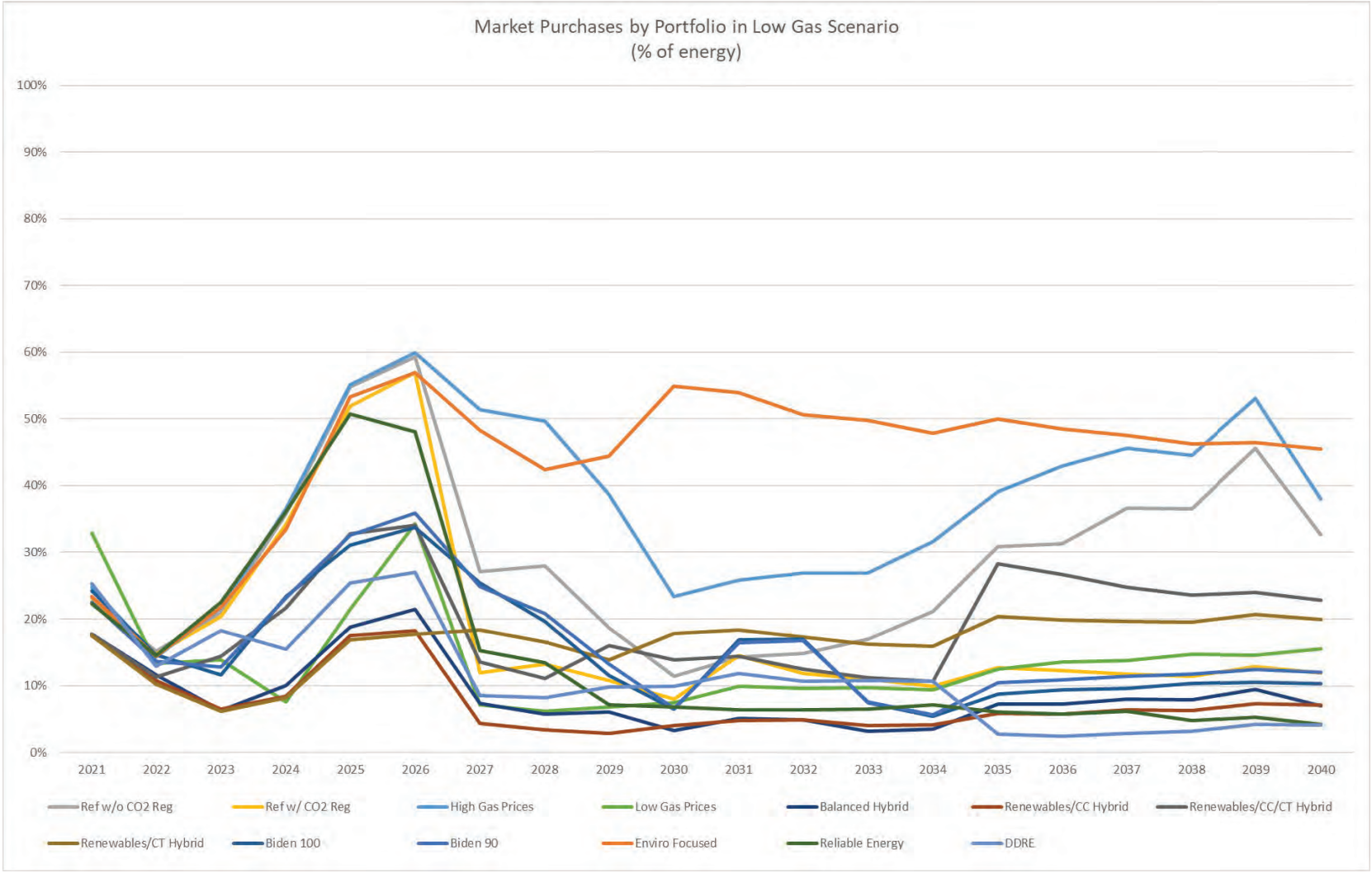
Market Purchases in Ref w/ CO_2 Reg (% of energy)



Market Purchases in High Gas Scenario (% of energy)



Market Purchases in Low Gas Scenario (% of energy)



DEI IRP - Meeting 7 Question / Answer Report

#	Question	Asker Name	Respondent	Answer(s)
1	I'm so sorry to hear that Stewart!	Anna Sommer		
2	Totally understandable, Stewart. Sorry to hear.	Wendy Bredhold		
3	Stewart, I hope things go smoothly for your father and your family. - Indra	Indra Frank		
4	Best wishes, Stewart.	Mike Mullett		
5	Sending purple light and prayers, on behalf of Indiana State Conference of the NAACP to Stewart and family	Denise Abdul-Rahman	Stewart Ramsay	thank you very much. You all are about to have me in tears. I can't tell you how much I appreciate your prayers and wishes. Thank you
6	Duke has left us out of the most essential part of the stakeholder process—working on the basic modeling files together. We were pushed off in 2015 and in 2018. Respectfully, this is a failure of leadership to not work with stakeholders. The timeline is flexible, and modeling should not have been finalized without stakeholders.	Jennifer Washburn	Stan Pinegar	I will begin and I think Scott needs to address the more granular suggestion that Jennifer has made. Its not the first time that Jennifer has questioned my leadership at Duke Energy Indiana, so I get it, and that's fine. Its part of the process. I don't accept that we have not been transparent and cooperative. If that is the view then so be it. We will strive to better in that regard. I believe that despite the outcomes and perhaps some disappointment in the what is before us today, the proposition that this utility and the folks representing it aren't transparent and cooperative - I think that we are. That is up for debate I suppose, and it always is. So Scott, because you were more intimately involved in the back and forth with Jennifer's group and others, would you like to address the more granular suggestions that she makes?
			Scott Park	Sure, and so I would agree with Stan that I think we have been very accommodating with the provision of data, perhaps not on the timelines that the many stakeholders wished they would have received this information, but this speaks to the complexity that has caused us to add meetings and reschedule meetings where all of these things are interrelated as we do this analysis. When one thing changes or when one error has been noticed in the model, it causes us to go back and do things. So we have been active in terms of setting up the virtual data room for stakeholders that have chosen to sign a non-disclosure agreement, uploaded numerous files to that to answer those questions. We have added a number of stakeholder portfolios as well as conducting a number of sensitivity analyses to address those concerns. Having said that, I fully recognize that the process certainly can be improved, and I think that if we do look back at when we started this stakeholder process for the Indian IRPs, the progress that DEI has made, as well as the other utilities I think is considerable in terms of the rigor of the analysis as well as the stakeholder engagement. By no means is that intended to stop with this IRP, and certainly I would like to talk to stakeholders before we get going with the 2024 IRP. How can we make this process more satisfying to all those concerns, recognizing that we are not all going to agree. But, if we can at least achieve a higher level of understanding, I think that would be a step forward. Perhaps before we get started we should talk about roles and responsibilities and expectations before we even get into the IRP process itself. We should lay the groundwork and get some understanding among the parties of who is going to do what. By all means this is not the last time, and we will keep trying to improve the process and, again, try to make it as satisfying as possible to stakeholders.
			Jennifer Washburn	We were pushed off in 2013, 2015, 2018, and now in 2021. Next time is not good enough. You gave us the modeling files in late September with the caveat that none of the basic data could be changed. We can wait and be patient and understand when modeling is delayed, as long as Duke gives us time to collaborate. That didn't happen.
			Jennifer Washburn	We had a process laid out. It was not followed. Duke should've waited to finalize modeling.
			Jennifer Washburn	Again, we had that set up. We had those convos. Duke just didn't follow the process we agreed on
			Kelley Karn	Jennifer - let's meet and talk offline about this. While the timeline was delayed, we did give an opportunity for input and provided all the files as we had them available starting in Sept. Any issues brought to our attention we analyzed as you will see in the sensitivity analysis provided today. This was a complete re-run of MISO market, new power prices, and new DEI runs changing to use the input you suggested. As for going forward, let's talk soon to discuss.
			Jennifer Washburn	Kelley, could you explain why, from your perspective, that there was opportunity for input? Because we were specifically told there wasn't, e.g., that was the rationale for keeping DEI's approach to the reserve margin requirement?

			Kelley Karn	I guess, I think that allowing for input is not the same as agreeing with every recommended input change. Of course, we will have disagreements. As you know, our position remains that it is not possible to model the new MISO construct since it is currently still under development, is extremely complex and the impact on our units is uncertain from year to year. That is something we will continue to review. Additionally, it won't take effect until a few years from now, so when we know more, we will improve the modeling.
			Jennifer Washburn	Thanks for your response, Kelley. This comes down to the fact that the modeling files provided in Sept were provided with the statement that that modeling was final. We don't expect you to adopt every recommended change, but we do expect the opportunity to offer changes and we expect Duke to be willing to consider those--the essence of the stakeholder process. That is why we are so frustrated. There were other changes we wanted to offer, but Duke told us the modeling was finalized. With other utilities, we are provided draft results and start our collaboration there. Duke said that was the plan back in the Spring.
7	When will Duke begin the RFP process?	Leslie Webb	Duke	We expect it to begin in 2022
			Leslie Webb	January or December?
			Duke	Jan-22
			Leslie Webb	We respectfully request an opportunity to weigh in on the draft RFP before it is issued. We also request the opportunity to review the bids. We have been able to do this with other utilities and can work on proper NDA language.
			Duke	That's our intent. You'll hear from Charles River, the third party administrator, at the end of today's meeting.
			Leslie Webb	Thank you, Kelley. Ballpark, what will be the deadline for proposals?
			Leslie Webb	Thanks, Kelley and Beth.
8	Hi all, just wondering if Nikki Shoultz and I can be added to any future IRP email distribution lists, since Jeff Earl has left our firm? Let me know if there is someone I should contact. Thanks, -Kris	Kristina Wheeler	Kelley Karn	Sure. we will add you. Thanks for joining.
			Kristina Wheeler	Thanks, Kelley. Also, if there's an NDA Nikki and I should sign, feel free to forward to me at your convenience. Appreciate your help, -Kris
9	Will the stakeholder engagement continue during the upcoming 90 day comment period for stakeholders?	Mike Mullett	Kelley Karn	It definitely can. I know we still are working thru the scenario /portfolio you proposed. We will work with you on that.
			Mike Mullett	That is good to see -- thanks!
10	Environmental Focus Portfolio -- How do you get 586 mW out of Edwardsport on NG without the heat from the coal gasification process to produce steam for steam turbine?	Mike Mullett	Scott Park	When we go to a natural gas unit there is some loss because of the steam that does come over from the gasification process that powers the steam turbine. There we do see a decrease in output.
11	My name is Deb Sitarski. I am a lifelong NAACP member, customer. Stakeholder and Duke Energy shareholder. My question is: why is it taking so long to convert to solar? The coal industry is dying. We need to be ready - the future is Now. Also, it really isn't necessary to be snarky about transparency: we have a right, and you have an obligation	Deb Sitarski	Scott Park	We understand and are making a transition to cleaner energy transition. I don't believe anyone intended to be snarky. We understand our obligations in the stakeholder process and take those seriously. Thank you for your input.
12	But, when the Industrials did it for the rate case, they only got 460 mW -- so how does Duke get 586?	Mike Mullett	Scott Park	I'm not sure of the source of 460 MW, but 586 MW is our best estimate of peak load on natural gas.
13	E.g., are there specified equipment changes? There must be because the coal gasification process heat produces a LOT more than 32 mW. You are only talking about the difference between the Edwardsport summer and non-summer rating with the 32 mW between 586 and 618.	Mike Mullett	Scott Park	Without gasification there will be ~150MW less auxiliaries.
				Hi Mike, our modelers indicated that turbine upgrades are assumed with the 586 MW
				Are those upgrades reflected in the modeling files for the Environmental Focus portfolio? If so, where may they be found?
				All the portfolios that transitioned Export from coal to gas assumed the turbine upgrades to decrease the derate amount. In terms of where to find it in files, please follow up with Scott on that.
				Will do -- please make sure that your direction to me to follow up with Scott makes it into the notes!
14	Is the CO2 reg assumption the $5/ton escalating at $5/ton per year discussed previously? If so, when is the first year?	John Jones	Scott Park	Correct. It would be interesting to know the magnitude of those sorts of things but there is so much that can happen between now and then, I don't think that gets above its margin of error.

15	Please explain that the RE portfolio had a different cost depreciation basis for natural gas, i.e., 15 years versus 30 years. Therefore the costs for the RE portfolio may not be comparable with the other portfolios.	Emily Medine	Scott Park	Yes, when we work with stakeholders we go through a process of establishing the principles that that stakeholder wants to use to specify their portfolio. Reliable Energy, as well as others, suggested that we shorten the appreciable life of a resource - in this instance gas resources. What that does is that it concentrates the cost in a time period that is shorter than the operable life, but it can create the risk that we get into a future, 15 years from now, where gas resources may no longer be an option, as a result of technology, regulation, or even fuel supply. So that accommodation has been made to shorten the appreciable life of the gas units for this portfolio. It does make those resources relatively more expensive versus the others, and therefore tends to have the model select other resources. (Chris Hixson adds) It is in the PVRR and tends to shorten the necessary to recover the costs but does not cover the actual operating life of the unit (Back to Scott) So what that means is that in this portfolio the CC that gets added in 2027, on we get to 2042, assuming everything else is fine, the resource is paid for and free to generate. It becomes a free and paid for asset that could operate for decades to come. That additional optionality on the back end has been captured in this analysis. Accelerating the depreciation would have those units be less attractive in early years and more attractive in later years. It pulls the cost impact forward.
16	My point is solely that the costs are not necessarily comparable.	Emily Medine	Duke	Understood
17	Do these CO2 reductions include upstream emissions?	Emily Medine	Duke	No. There is a sensitivity on that later.
18	But, that assumption also entails that the NG would be retired and replaced by another resource at the end of 15 years, correct?	Mike Mullett	Duke	We recovered the cost over a shorter life, but still allowed the plant to operate for its assumed 35 year life.
			Mike Mullett	Hmmmmm....what is the rationale for that combination?
19	Why is Duke using a baseline from 16 years ago for assessing CO2 emissions reductions? Could you please provide CO2 reduction numbers based on a recent year (2019 or 2020) as the baseline? It is difficult to tell how much emissions would be reduced relative to the current picture using this baseline.	Ben Inskeep	Kelley Karn	To stay consistent with Duke Energy's carbon goals and sustainability reporting.
			Ben Inskeep	Thanks, Kelly. On that topic, could you or others at Duke explain how adding new fossil gas plants aligns with Duke's net zero emission by 2050 goal? Is Duke assuming CCS will be added, and if so, have these costs been included in your modeling? Is Duke assuming it will purchase offsets? Is Duke assuming it will retire these assets in 2050?
			Kelley Karn	Sorry, Ben for delay. I started typing and it got wiped out! You will notice that this plan only has one NGCC, which is less than prior plans. When we retire so much coal, we see a need for dispatchable energy resource for reliability in the near term. You will note that the CTs are later in the plan post 2035. The plan there is for them to be hydrogen capable to reduce emissions. Of course, how technology develops between now and then is important and that will impact which technology we choose. The CTs could be thought of as a placeholder for new technology such as hydrogen, SMR, CCUS, or long duration storage - anything low/no emissions.
20	My understanding was the Duke Energy was committed to at least 50% carbon reductions by 2030 (and 100% by 2050), so will that be met in this IRP?	Shannon Anderson	Duke	Yes, the portfolio puts us on track to meet those goals. But, this analysis goes through 2040.
			Jennifer Washburn	Will do, thanks.
21	Also, please note that we do not have the Portfolio 7 modeling files. We have a partial set of files because Duke did provide the files for the optimized runs, which we assume will contain similar data to the hybrid portfolios they modeled. But we are missing the complete set, including any updates or changes Duke might have made from when Duke provided the files in response to SC 2.1-A, along with the changes that Duke had to make to model these hybrid portfolios. We are also missing the files Duke used to run the sensitivities.	Jennifer Washburn	Kelley Karn	Thanks. We will review and get back to you. I do know the sensitivities where just completed in the last few days. Please follow up with Beth on the data request process. DATA PROVIDED
22	Is your avg market purchase based at peak demand?	Leslie Webb	Scott Park	Its across all hours
23	Please remind me of the estimate of total consumption increase over the life of the IRP	Ray Wilson	Scott Park	If our load growth forecast is about .6 or .7 percent per year, that probably gets to a 14 or 15 percent increase over the 20 year period.
24	Stewart, once Scott gets through the sensitivities, I would like to make some comments on behalf of the Duke's Industrial Group. I will raise my hand on my phone since that has the microphone.	Aaron Schmoll	Duke	Yes (Next Line)

	(AARON SCHMOLL COMMENTS ON BEHALF OF DUKE's INDUSTRIAL GROUP		Aaron Schmoll	Duke modeled four optimized portfolios that all selected Edwardsport to run on natural gas starting in 2023, which was the earliest year the Duke believed the operational change would be possible from a regulatory perspective. - For the hybrid portfolios, including Duke's preferred portfolio, none of the portfolios switched Edwardsport to natural gas before 2035. In questioning Duke about its modeling, we received the following responses: 1. Duke used for a generic combined cycle unit as a proxy for the cost of running Edwardsport on natural gas. EIA data for combined cycle O&M expense from the Department of Energy indicates this cost is about $10M annually, which is less than a tenth of the cost to run it on coal; 2. Duke hard keyed every output of the hybrid models, including its preferred portfolio. Duke's continued reliance on hardwired outputs ignores the economic modeling that selects the most economic resource. 3. Immediately following the October stakeholder meeting, we requested Duke to provide information on the hybrid portfolios with one key change: convert Edwardsport to natural gas in 2023. We asked how this one change would affect the net PVRR, CO2 reduction, and level of market purchases. Cost, risk, and environmental impact are key issues our clients. Duke has objected to providing this information. Small burden to run this one sensitivity, and highly relevant to a major issue in this IRP. - Each year that conversion of Edwardsport to natural gas is delayed potentially costs ratepayers more than $85 million of expense that could otherwise be avoided. Delaying the conversion to 2035 results in ratepayers paying about $1 billion more than if the conversion occurred in 2023 and is significantly worse for the environment. - Each year that conversion of Edwardsport to natural gas is delayed potentially costs ratepayers more than $85 million of expense that could otherwise be avoided. Delaying the conversion to 2035 results in ratepayers paying about $1 billion more than if the conversion occurred in 2023 and is significantly worse for the environment.
			Scott Park	Thank you Aaron - to address some of those points. It is true that in the optimized cases there was the earlier retirement of the Edwardsport gasifiers. We wanted to replicate in the other portfolios, because if all portfolios were the same we don't learn anything about the differences. That is one of the reasons we included the continued operation of the gasifiers in the hybrid. There is also the additional flexibility and optionality of continued use of the gasifiers. The RE portfolio included carbon capture and sequestration. That is something we want to be mindful of. Edwardsport is a more expensive unit, but it is also the cleanest coal unit since a lot of the pollutants get stripped out before the combustion process happens. Finally, when there is that conversion the output of the unit gets smaller, so the megawatts would need to be made up somewhere else and that would come with a cost, and the dispatch of the unit would changes as well. We would expect that unit to run less when its operating on natural gas because of its higher cost on a MMBTU basis. These are the primary drivers behind what we have done in the hybrid portfolios. As far as the timing, we extended the deadline to September 20. That would have been the more appropriate time than late October or early November.
			Aaron Schmoll	From our point of view it is not any stakeholders responsibility to propose any portfolio for Duke. It is Duke's obligation to show that its preferred portfolio is the most economic one for the planning period. If Duke wants to make the decision to continue running Edwardsport as an IGCC unit, fine, but at least show the data so you can justify that decision.
25	I'm worried your interpretation on temp impact from climate change might be under estimated. I'd like to suggest you verify your modeling assumptions with Purdue to close the loop.	Leslie Webb	Duke	I'll check Leslie. I believe we did have a loop back with Purdue on this. But, I'll confirm. CONFIRMED.
26	For cities that pump stormwater, there are significant rising climate costs for the Midwest. Was that taken into consideration?	Shannon Anderson	Duke	I don't believe the modeling was that in depth to include external costs like that. Mostly focused on direct costs to the energy industry.
27	Was the recent release by the UNFCCC COP 26 Agreement taking under consideration with the analysis?	Denise Abdul-Rahman	Duke	Hi Denise - That likely came too late for us to incorporate. But, you will see we included a cost on carbon and paid close attention to the carbon reductions each portfolio are expected to have.
28	Did the RFI sensitivity also include an upward increase in the solar capacity factor to align with the RFI responses?	Anna Sommer	Chris Hixson	No it did not include higher capacity factors for solar. It only included lower capital costs
29	Were the RFI bids for storage resources modeled in the RFI Sensitivity? Or is it the case that the model did not select any standalone storage in this sensitivity even with the RFI bid pricing?	Chelsea Hotaling	David Pitts	No we did not include any of the storage. I think most of the RFI was solar.
			Scott Park	Yes it was very concentrated in solar. I think there were a few limited storage options. Generally speaking we don't see storage being selected economically. In the IRP models its really looking at capacity and energy arbitrage. Storage can provide those as as resource, although its relatively expensive. But, it can provide a number of other resources.
30	Can you provide the winter ELCC value that was modeled for wind in this sensitivity?	Chelsea Hotaling	David Pitts	We used 20%.
			Chelsea Hotaling	Thanks David!
31	For your sensitivity analysis, why do you use the "ref 2/CO2 reg portfolio" as your reference for this analysis?	Leslie Webb	Duke	Recall there were four scenarios - reference w/CO2 regulation, reference w/out CO2 regulation, high gas and low gas. Our thought is the reference with CO2 regulation is the most relevant scenario to run the sensitivities in. (i.e., most likely future)
32	Hear, hear.	Wendy Bredhold		

33	So, the metrics are subjectively considered but not arithmetically weighted consistently across portfolios?	Mike Mullett	Duke	Correct. there is no weighting involved.
34	Can you clarify the conditions under the "extreme weather weeks in PST" criteria? Are there specific outages you are trying to overcome (either fuel or gen)? Is there a specific hour test?	John Jones	Duke	We used a portfolio screening tool that was provided earlier in the IRP stakeholder process. It looks a discrete hours in winter and summer to determine whether a portfolio can serve that load. It's based on historical data on DEI's system.
35	Will you be providing the back up to these calculations? Please confirm that sunk costs are included in the rate calculations?	Emily Medine	Scott Park	Sunk costs ARE included in the rate calculations. Rate base is in the rate calculations.
36	One question we asked you to follow up on last meeting was how the PST metric would account for factors not contained in your dataset, e.g. the increased performance of EE during a winter event?	Anna Sommer		The PST does not test for all circumstances that can arise during extreme weather conditions, but does add realistic and linked temperature, load as well as solar and wind output
37	Please add to your answer how the CCS costs are handled. If the 45Q credits offset all the capital, would it show as a cost.	Emily Medine	Scott Park	The credits were included but the phenomena we were seeing there is that the cost of the sequestration equipment is a near term cost and the credits are more production value and they extend over time. They show up more in a present value of revenue requirement rather than a 5 year rate window. The higher cost is largely as a result of the higher carbon capture. It will take some work but we can show you the components that make up that rate data and that is something we can do. Added to confidential ShareFile site.
38			Emily Medine	That's fine. check on the 45Q in the meantime
39	Why are you building unnecessary CCS if you're concerned about rates?	Megan Anderson	Megan Anderson	This is Megan not Ashley* sorry about the log-in discrepancy
			Duke	The DEI preferred portfolio No. 7 does not include CCS. It is an option we may have in the future and it may prove cost effective. CCS is included in the Reliable Energy Portfolio.
40	Hi Scott and Stewart, is there any chance you can un-mute Anna Sommer, Chelsea Hotaling and me (for the CAC/EFG presentation)?	CB Hall	Peter Claghorn	Yes - we can do that
41			CB Hall	Thank you
42	Is the HHI based upon ICAP or UCAP?	Emily Medine	Scott Park	It is based on ICAP in 2030
43	You know we're running out of time to protect the future for our kids and grandkids…warming is tripping reinforcing feedbacks that accelerate warming (like methane release from permafrost). So, short term emissions are critical. How does portfolio 7 fare with regard to CO2 in 2030?	Leslie Webb	Duke	Pretty well. In a carbon regulation future, the reduction is 53% when you include a contribution of carbon to market purchases. 83% by 2040.
44	Hi Scott, the original email came from me (not Anna). Thank you	CB Hall	Scott Park	Thanks. I have the slides now
45	Can you expound a bit more on Duke's thinking on the role of storage? I think I heard it mentioned earlier that Duke is hoping to make future improvements to how storage is modeled so that more value streams of storage are captured by the model. Is it Duke's thinking that this is the main reason why storage was not selected as part of the Preferred Portfolio, or do you see other reasons storage wasn't selected? As Duke is able to improve storage modeling over time, is Duke thinking that storage will be re-evaluated as a resource option for future years? And if you can provide a bit of clarification on why you mentioned solar+storage is valued higher than stand-alone - don't paired systems face greater charging restrictions based on investment tax credit limitations?	Danny Musher	Scott Park	The reason storage was not selected is a combination of things. Certainly there is the cost of storage, but then also in RTO's, the RTO also acts to some degree like a giant battery. You can inject and withdraw at the power price. And so, as a result, the market itself can act as a storage vehicle compared to stand along utility that doesn't have that ability. The value proposition with batteries would be greater at a vertically integrated utility as opposed to one that is a member of an RTO. That is the primary reason. Low power prices are another reason. When we have low power prices that are less volatile that is not where batteries shine. Higher prices and more volatility, batteries would love that, and they would provide an economic benefit of taking low price power and discharge at higher prices. Going forward, if we can improve the modeling of batteries that will probably help, but where it will really come to a head is in the RFP process where we can take a look at a more detailed look at the value proposition of a particularly resource. At the IRP we are looking at the whole system for 20 years and so batteries are only an element of the IRP process. More detail would involve questions like, what is the location of a battery? This has a big impact on the value proposition. And, we will have specific cost information. Regarding pairings solar with storage. While it is true that there are some tax and operations constraints in terms of the ability to fully utilize storage in a solar component, there is also some cost savings. As of now the cost savings of pairing solar and storage outweigh the incremental benefit of breaking those resources apart. Solar and battery contributions to the grid don't typically occur at the same time so you can use smaller interconnections, inverters, and other resources. You are getting economies of scale. Another benefit is if RTO's development more products that storage can take advantage of. As of today, coal units have some inertial mass spinning, they provide the ability to ramp up and down on automatic generation control, they provide a lot of stability to the system, and the need for this will not go away with their retirement. There has to be something to replace that. I believe the RTO's are going to have to develop market products that send the proper investment incentives and storage or other devices could become economically viable to provide those valuable resources. Once there is a mechanism for storage to capture that value, that will be another benefit for storage.
			Danny Musher	And if you can provide a bit of clarification on why you mentioned solar+storage is valued higher than stand-alone - don't paired systems face greater charging restrictions based on investment tax credit limitations?
			Duke	Definitely will be re-evaluated going forward. I believe lower amounts of storage were selected primarily due to its costs. If you can add new value streams to offset the costs, costs come down over time, etc., storage would increase.
			Danny Musher	Is it possible for this question to be answered live? It would be helpful to hear y'alls thoughts. Appreciate it.
			Stewart Ramsay	Yes. I will ask these questions live after CAC folks are done
			Danny Musher	Thank you Stewart!

	(hand raised question) I just wondered whether you happen to see the new published and peer reviewed study by the NREL with respect to using end use efficiency in that role and the extent to which that study shows that, as far as being able to do 100% renewables without long duration storage that cost effective end use efficiency can do that job.	Mike Mullett	Scott Park	I have not seen that Mike, will you send that to me?
			Mike Mullett	I will send it to you
46	Carbon capture and storage remains too unproven to be a viable strategy. There is no way of knowing if stored carbon will remain underground indefinitely. Injection could contaminate groundwater supplies or trigger earthquakes. The process is very energy-intensive and decreases	Denise Abdul-Rahman	Duke	Denise - We do not include CCUS in the preferred portfolio, number 7. It is included in the Reliable Energy portfolio. It is an option in the future, but many issues you mention must be addressed.
47	perfect, thank you Stewart	CB Hall	Stewart Ramsay	no problem
48	Have you built in the model mitigation costs?	Denise Abdul-Rahman	Scott Park	Not sure what mitigation costs are referenced here- if related to prior CCS question. Then, no CCS is not included in the DEI preferred plan or any mitigation costs.
49	53% reduction by 2030?	Leslie Webb	Scott Park	yes.
50	what kind of storage is being considered?	Ray Wilson	Scott Park	The stand-alone battery is 50MW/200MWh. The battery associated with the solar+storage is 20MW/80MWh.
51	is the new CC in 2027 assumed to be located at the Cayuga site to provide steam to the paper facility or is that no longer a consideration?	Devi Glick		We are not predetermining where it would be located. We will be doing an RFP and that may sort out a more precise replacement plan. The steam customer is still existing and some solution will need to be found for them. We are in discussions.
52	Can you email out this slide deck post presentation?	Anne Becker	Stewart Ramsay	(After consultation with Anna) Yes we can
53	What impact would this make on all the portfolios? Does this mean thermal units are not really as available as Duke has modeled? Please a brief explanation.	Leslie Webb	Scott Park	If the methodology that we are looking at on the chart (CAC chart page 4) shook out, it would mean that we would have less available capacity to apply under certain scenarios that the current analysis show. , And it also means that the load obligation also goes down.
			Leslie Webb	thank you, that helps
54	Thanks Scott for the reflections on batteries (see Question 45 above)I really appreciate that. Did I understand correctly that Duke might still consider selecting a battery in an RFP even if batteries are not part of the Preferred Plan?	Danny Musher		Yes. The RFP will be pretty broad and should include the potential to bid in storage.
			Danny Musher	Thank you!
			Ray Wilson	THANK YOU
55	Can the gas consuming electric utilities put pressure on the gas suppliers to reduce their methane emissions fast	Ray Wilson	Duke	Duke Energy has some gas utilities and we are looking into methane emission reductions. We have a corporate methane goal. We don't have gas in Indiana, just electric. That's a good question and one I'll take back to the team. Thanks.
56	one last question - can you provide slide 22 for 2030?	Leslie Webb	Scott Park	Yes, we can do that and made this available stakeholder post meeting
57	When will the RFP come out?	Jaime Holland	Dan Sympson	The working timeline is we will be launching the RFP in early 2022. We are now designing it and will be looking for some stakeholder feedback along the way, prior to launching,
58	Thanks, Bob Lee. We look forward to working with you on the draft RFP. Please reach out whenever you are ready. We'll make ourselves available.	Jennifer Washburn	Bob Lee	sounds good.
59	What are the emails to contact for more information or further questions?	Margo Radach	Kelley Karn	scott.park@duke-energy.com stewart@vanry.com
60	Stewart -- what is your e-mail address?	Mike Mullett	Stewart Ramsay	stewart@vanry.com
61	Thank you	Jaime Holland		
62	Thank you, Stewart Best to your dad!	Leslie Webb	Stewart Ramsay	thank you Leslie. I appreciate it very much
63	Kelley - could you please send me a link to the PST?	John Jones	Kelley Karn	I'll include it in the notes - and email it. Don't have it handy… Follow up: Karn emailed link to Jones. https://deiscreeningtool.duke-energy.com/chart
64			John Jones	Thanks

MISCELLANEOUS

STAKEHOLDER COMMUNICATIONS

Duke Customers' Petitions to Stan Pinegar, President of Duke Energy Indiana, to Take Action on the Climate Crisis

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The attached spreadsheet contains 618 petition signatures from residents of 79 Indiana cities. Of the petition signers, 242 wrote additional personal messages to Stan Pinegar.

The petition reads as follows:

> As you develop Duke's 20-year energy plan, we, your customers, urge you to take action on the climate crisis.
>
> - Move beyond coal before 2030
>
> - Eliminate fracked gas plants from your plans
>
> - Transition to 100% affordable, renewable energy before 2030
>
> Fossil fuel pollution harms our environment and climate. Low-income communities and communities of color suffer disproportionate damage that is especially visible during this unprecedented time of global hardship. Utilities across the state and country are moving quickly to provide customers with inexpensive, clean, renewable energy, while protecting impacted communities and workers in the process.

The following quotes are a sampling of the thoughtful, passionate personal messages that many petition signers wrote:

> "Fossil fuel contributes to human pollution that is destroying the planet. God may have created the world, but he entrusted humanity as caretakers. Please help take care of the land for our children and future generations. Focus on solar and wind. Believe it or not, some people in this state actually care." - **Morganne, Bloomington**

“I am a customer and am concerned that I’m paying more and more for energy that is not renewable. Not only is it not renewable, but you seem to be finding even dirtier ways to supply our energy. Please get with the times and move to renewable energy that will give our children as much opportunity to enjoy the planet as much as we have.” - **Jaclyn, Carmel**

“I have seven grandchildren and in a few years may have great-grandchildren. It matters very much to me how damaged our planet is when they are grown. We KNOW how valuable coal was as an energy source in the past, but now we also know what burning coal does to our environment. It is time for Duke Energy to be a leader in renewable energy. Words don't count...actions do!” - **Ann, Cicero**

“Please, this is the only world we have. Don't let greed destroy it. Think of the planet, the beauty within it. Whether it comes from society, nature, God, pets, or your cherished loved ones; by going through with the decision you will have planted a seed of destruction. A seed that once matures creates an invasive, smothering vine to everything we and you hold dear. Please reconsider and find another way. There is always a better choice.” - **Breana, Columbus**

“I am begging you to move to clean renewable energy. My son and so many other children have asthma and what is put into our air impacts keeps them from living a healthy full life.” - **Jennifer, Fishers**

“I have been a customer for years. I am always receiving info that you are taking the climate crises seriously but I don't see that put into practice. Please act now.” - **Sue, Lafayette**

“Duke Energy, you're a major player in energy, so lead by example. Think of the legacy you can create and the world you will leave behind for the next generation, our children and our future grandchildren. Let the norm become clean energy, bring profitable while still making a positive impact. Be better than those who say we have always done things this way. Your company will continue to have loyal investors, and will even increase in the number of loyal investors when you make a stand and make a change. I use 100% green energy for my electric and wish I had the same option for my gas. There are those who will choose to do the same as the option is given to them.” - **Melissa, Mooresville**

“Please do not stick your head in the sand to avoid the reality and the dangers of climate change. Our planet depends on us. Our kids depend on us to make good decisions. TAKE POSITIVE ACTION NOW to move away from dependence on fossil fuel.” - **Beth, New Albany**

“It's beyond time to move to energy methods that are clean, non-polluting, and incredibly harmful to our health and the environment! Get with it for heaven's sake!” - **Delma, Zionsville**

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618	Gregory Elliott		
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	D
1	**Personal Message**
2	I live in an area where coal ash cleanup is a big issue that is hurting development. We need GREEN energy, not coal!
3	This is not just an environmental issue, but a human rights issue. Duke needs to do more to support the people who provide Duke's revenue!
4	Dirty energy is not cheap. Prioritize people over profits. Move from dirty energy.
5	Absolutely NO FRACKED GAS PLANTS . IN INDIANA ONLY SAFE, CHEAPER, RENEWAL ENERGY SOURCES::SOLAR, WIND, WATER.
6	Clean air and water is the foundation of a healthy and good life! Do not destroy the earth!!!!!
7	CLEAN. ENERGY. NOW.
8	Energy is vital, but we need to stop relying on coal powered sources. There are cleaner renewable resources that, if not less expensive currently, will become less expensive with increased demand. It's an investment in the future for all of us. Please do your part to make it happen starting now.
9	For the sake of our children and future generations it is incumbent on us all to be responsible stewards of the environment and the best, most sensible course going forward is to abstain from fossil fuels, coal mining and fracking and instead commit ourselves to the development of renewable resources. Scientific consensus is overwhelmingly in support of this to protect our planet from global climate change.
10	Fossil fuel contributes to human pollution that is destroying the planet. God may have created the world, but he entrusted humanity as caretakers. Please help take care of the land for our children and future generations. Focus on solar and wind. Believe it or not, some people in this state actually care.
11	Fossil fuel pollution hurts our children. We have to think about the future and wean ourselves off fossil fuels. Other utilities are moving toward inexpensive, clean, renewable energy. Why can't Duke? Why is Duke so special?
12	Fracked gas is not the future of energy! Leave the fossil fuels in the ground and switch to renewables for a cleaner, healthier Indiana.
13	Fracking caused irreparable damage to the environment, and in a state rated as the 2nd most polluted state in the country, that is not a viable option. As a resident of Indiana I insist that you abandon this harmful plan.
14	Fracking is just as much a hazard to the environment as what you are doing now! This is not sustainable! Find something else that is renewable and affordable.
15	Get out of Indiana,
16	I don't understand how you can have no thought of the next generation. I w
17	I have invested in solar on my rooftop, but we can solve the climate crisis until utilities are on board.
18	If you don't go as quickly as possible to utility-scale wind and solar, you'll be obsolete once Tesla wises up and goes utility-scale alongside rooftop solar. Or, you'll simply become known as one of the worst planet killers.
19	Indiana deserves to have clean air and a chance at a better healthy life.
20	It is long past time to transition to cleaner energy than coal. Please help improve the environment and human health.
21	Please invest in renewable energy.
22	Please stand by your word of working towards moving past a reliance on fossil fuels. Prove Duke is a company we can trust and believe in.
23	PLEASE USE CLEAN ENERGY APPROACHES! No more coal. No more disturbing the earth. PLEASE!
24	There is no reason for failing to move toward renewable, clean energy NOW! Hoosiers deserve to know your plan for making that happen.
25	We all know that coal is not our future. Please act with consideration for future generations.
26	We must transition away from fossil fuels for the health of the planet and humanity. Duke Energy is ideally positioned to be in the forefront of this transition to renewable energy sources, with its vast resources and dedicated workforce.
27	We NEED a BeTTer plan. Reusable, clean energy!!!!! A little respect goes along way. No frakking!
28	We need to aim the Other direction; clean the environment, save the planet.
29	What are we leaving our children? Please reconsider.
30	Your intention to move slowly toward renewable energy and remain committed to fossil fuels is a formula for increased this investment. To guard against this, follow industry trends toward accelerated adoption of renewable energy.
31	Fracking changes the environment in that area. Bad for plants and animals.
32	If you don't start investing in clean energies your company will be left behind. Why not be seen as a leader of positive change instead of one holding on to the past for monetary gain. Time to clean up your coal mess and focus on a cleaner future. It's time to start cleaning up the mess you've made of Indiana. Fracking is unnecessary. The future is clean energy and nothing to do with coal is clean!
33	Why does Indiana always have to be at the top of the list of states of super polluters? There are so many better energy options now. Duke get on board with clean energy.
34	We need clean energy. Please move in that direction for the good of everyone.
35	As a customer, I want clean power.

	D
1	**Personal Message**
36	As a Preventive Medicine and Family Medicine physician, I can not urge you strongly enough to avoid supporting any fracked gas projects.
37	As the grandfather of 6 I care a lot about the future of our planet. The scientists I read keep saying we need to keep all the coal and oil in the ground to avoid catastrophic climate change. Please do the right thing and transition to clean energy by 2030! Thank you. Dennis & Diane Shock, Carmel
38	Clean up your act, Duke Energy!
39	I absolutely do not want fracking in Indiana! Surely you executives know the health risks to residents near the site
40	I am a customer and am concerned that I'm paying more and more for energy that is not renewable. Not only is it not renewable, but you seem to be finding even dirtier ways to supply our energy. Please get with the times and move to renewable energy that will give our children as much opportunity to enjoy the planet as much as we have.
41	I am a part of the Confront the Climate Crisis campaign. I along with the citizens of Indiana urge you to move beyond the use of coal and transition to clean and renewable energy. Air particulate pollution kills 1 in 5 people. There are countless Hoosiers that have died early deaths because of exposure to coal ash and pollution from your factories. Please keep this in mind and remember that you can't make any profits off a dead planet.
42	I care about the future for my children and grandchildren. Please consider our plea.
43	I've been visiting Cape Cod since I was a child. I would like my children and grandchildren to be able to visit it as well. My wife and I visited the Athabasca glacier on our honeymoon in 1998. At that time, it had retreated more than a mile from a visitors' center built in the 1920s. Will we let it retreat all the way into nothingness? Our family just discovered the Indiana dunes, and we'd like to keep enjoying them.
44	Let's be global LEADERS by moving to renewable energies and showing everyone else how things can be done, as we did after WWII. Germany is leading the way now and it's showing economically! Why not take the reins?!??
45	Let's not let Indiana be last in the fight to help make a difference towards reversing climate change. Let's improve the health amd finances of Indiana residents by making Duke be a better advocate!
46	our planet is dying but you can help.
47	Please only use clean energy. Coal is not CLEAN. Your customers deserve clean air and water.
48	The dangers from fossil fuel pollution have been known for many years. Our burning of fossil fuels is disrupting the Earth's weather. Increasing greenhouse gases in the atmosphere trap the warmth from the sun. This intensifies surface and air temperatures. As a result, excess heat energy builds in our oceans and atmosphere. This extra energy magnifies the normal ups and downs of the weather, adding more heat and moisture. The impacts from dirty pollution to the people and life in the US are devastating: billions dollars of weather related disasters *annually* which are sharply increasing throughout the 1980, 1990s, and 2000s . The destruction of natural resources due to fracked gas plants is also well documented. We must transition to renewable, affordable energy before 2030. The health, the lives of humans and animals are at stake. Your customers demand climate justice.
49	Time is running out to effectively address climate change. It is critical that Indiana electric utilities like Duke Energy accelerate their transition away from fossil fuels to a predominant renewable energy content.
50	To: Stan Pinegar, President, Duke Energy Indiana, Please shift energy production away from fossil fuels and towards renewable sources. The sooner the better. The less we use the better for our environment. It won't last forever anyway. Let's plan ahead so we can prepare for that day. As you develop Duke's 20-year energy plan, we, your customers, urge you to take action on the climate crisis: - Move beyond coal before 2030 - Eliminate fracked gas plants from your plans - Transition to 100% affordable, renewable energy before 2030 Fossil fuel pollution harms our environment and climate. Low-income communities and communities of color suffer disproportionate damage that is especially visible during this unprecedented time of global hardship. Utilities across the state and country are moving quickly to provide customers with inexpensive, clean, renewable energy, while protecting impacted communities and workers in the process.
51	We are running out of time to protect our children and grandchildren from the most serious consequences of climate change.
52	I have seven grandchildren and in a few years may have great-grandchildren. It matters very much to me how damaged our planet is when they are grown. We KNOW how valuable coal was as an energy source in the past, but now we also know what burning coal does to our environment. It is time for Duke Energy to be a leader in renewable energy. Words don't count...actions do!
53	Fuels derived from fracking are the worst possible choice, doing irrevocable damage to the soil, water, and all life dependant upon it. Although I believe in going green, I also understand going green is a process that takes time. Fracking has no place in Indiana.
54	Clean renewable energy is what will put Indiana ahead.

	D
1	**Personal Message**
55	During all strategic meetings, Duke needs to prioritize all forms of renewable energy as Duke decides how to transition into cleaner forms of energy in the 21st century. Investments in renewable energy are the path forward to living on a healthy planet this century. I have nothing new to say that you haven't heard before, but I raise my voice nevertheless. Please consider those who join me in this opinion as you consider the future of your business and your customers' optimal health outcomes.
56	Please eliminate fracked gas plants from your plans. Fracking is damaging on so many levels and it is unsustainable.
57	Please listen to the rate payers and understand how much we support clean energy. We want more than what Duke is offering which is environmentally expensive fracked gas and dirty mined coal. What I want is for Duke to invest in clean affordable renewable energy. Please quickly transition to 100% affordable, renewable energy before 2030. I have been against fracking since I learned about it over a decade ago. Nothing good comes from fracking. In my opinion, it's a backward choice to continue fracking for fossil fuels and Duke is responsible for the destruction of our natural landscape and our water aquifers. Fracking and fossil fuel extraction and use endangers humanity and our natural resources.
58	Please put our precious environment first!
59	Please transition to 100% affordable/renewable energy before 2030. Fossil fuels are enemy of our environment. Think beyond stuffing your bank accounts
60	Please, Don't build.
61	Please, this is the only world we have. Don't let greed destroy it. Think of the planet, the beauty within it. Whether it comes from society, nature, God, pets, or your cherished loved ones; by going through with the decision you will have planted a seed of destruction. A seed that once matures creates an invasive, smothering vine to everything we and you hold dear. Please reconsider and find another way. There is always a better choice.
62	Stan - You know how I have felt for a long time on this matter -- it is long past time for Duke to take dramatic action in the near-term on a Deep Decarbonization and Rapid Electrification Scenario here in Indiana! Mike
63	Stop
64	We have the technology to produce renewable clean energy and not damaging environmentally destructive unwanted means to produce power. The Earth has had enough. Please choose clean renewable energy production.
65	Coal is a dead end for the environment and for your business.
66	Coal is one of the biggest producers of green house gases in the world. If we hope for our children to have any future we must stop burning coal as quickly as possible and move to alternative energy sources (sun, wind, geothermal). If you care about your family and friends you will do everything in your power to move Duke Energy away from reliance on coal and natural gas to renewable energy sources, e.g. solar, wind, geothermal, hydrogen, etc.
67	I am begging you to move to clean renewable energy. My son and so many other children have asthma and what is put into our air impacts keeps them from living a healthy full life.
68	If we can get the green energy impacted into our lives sooner, we will be far more privileged in the future. The young will be educated by an earlier age age the amount of jobs will sky rocket.
69	I'm ashamed of this state. It's absolutely disgusting how greedy people are. Ready to move.
70	Investments in clean energy now will pave the way for Duke's success for decades to come. The need for clean energy is inevitable and those who adapt early will be well positioned to lead the industry later. Plus, this is the right thing to do - for our kids and grandkids. Please, use your position of power to leave a positive legacy! Thank you for your time!
71	No fracking plants in Indiana!
72	Please try to think forward about what this means for future generations. We need more sustainable practices and you can build your industry on. An investment now in technology will be more profitable long term.
73	Solar is less expensive and more reliable than gas. As a rate payer, I already pay for green power. Why is Duke making such an unwise investment?
74	These types of reforms cost money, but it iscritcal that Duke involve its stakeholders and make these green transitions immediately.
75	We have to make these changes ASAP! We owe it to our children to ensure a clean, healthy earth for them and their children. To get there, we have to act NOW!
76	Be part of the solution, not the problem, go solar and help the rest of us do the same.
77	The sooner you go green the sooner we can all breathe better.
78	This state needs to take action now! It has been been lagging behind due to inefficient government. There is no good reason to be on coal energy this day and age other than coal companies are lining the pockets of said governments here and it is shameful
79	We are Duke customers.
80	Go green!

	D
1	**Personal Message**
81	As one of your long time customers, I'm shocked to learn Duke wants to invest in fracking plants. I'm against fracking and hope Duke changes its plans.
82	Please transition to renewable energy sources and eliminate coal and fracking from current and future energy plans.
83	How are we going to fix problems when you keep setting us back. Stop setting us 3 steps back and let us step forward.
84	It's high time Duke that you move beyond coal.. Do NOT do fraking!!
85	Please pay attention and reinforce your foundation to aggressively facilitate energy w/o fossil fuels.
86	I am a long time Duke residential customer and hope that Duke Energy will take this issue seriously. Energy needs to move away from coal fired plants and carbon emissions to renewals and environmental friendly power generation. And, we need to do this now to stop ruining our environment. It is not about affording it, rather about the right thing to do for our planet and its people.
87	It's time to make the change. Clean air would be nice.
88	Please move toward renewable energy sources.
89	I've seen how fracking can adversely affected people. Why would you disregard the safety of your own constituents. This is crazy. STOP the madness! SAVE OUR PLANET! Our kids need it!
90	No fracking! EVER!!!! Think beyond your bonuses and profits. We need to be good stewards of OUR EARTH!!!!
91	PLEASE consider a better way, a path with less of an environmental footprint. We, as a whole, need to be thinking of future generations and what we are leaving behind for our children, grand children, great grand children and their loved ones. Our Earth is precious. We need to think of the wildlife impacted by climate change and global warming. Join these other companies in creating a path to a better healthier planet for future generations! There's no reason not to. Thank you kindly for your time.
92	We must make real progress in adopting clean energy practices before we lose the opportunity forever!
93	We need renewable energy. Not fossil fuels!!!!
94	Coal is not a sustainable energy source. There are so many newer, renewable energy sources that will be better for the environment, our communities, and will probably save money in the long run.
95	Come on, Duke. This is the future. Please get with the program! Climate change is a huge issue for me and so so many people! The longer we wait to make effective changes to the way we harness energy, the more expensive it is in the long run to fix the short-sighted actions you and other companies make today. And that cost will be on TAXPAYERS like me. This is not okay.
96	Every day is a great day to do the right thing. Those of us that rely on power to live know that renewable energy and a clean green future is better for us all!
97	For the environment's sake plus the sake of Indiana's future for good paying jobs, please begin the transformation phases needed to convert from coal to a more green source of power.
98	Fracking is a ridiculous investment at this point. Be responsible and invest in green solutions that insure a safe future for Indiana.
99	I am from Washington state and the wild fires as of late have made it abundantly clear to me that climate change is not some danger waiting for us in 2030, it is here right now. I urge Duke Energy to move beyond coal to save the people and communities that it serves.
100	I have been a customer for years. I am always receiving info that you are taking the climate crises seriously but I don't see that put into practice. Please act now.
101	I would very much like to leave a better world for my children, and transitioning away from coal would be a great step for that.
102	If Duke has control of our energy, they need to act responsibly with it. Please, Duke, step up and act ethically with the massive power and money maker you have been given. Develop a 20 year energy plan that transitions us to 100% affordable clean energy.
103	If not now , when. We have to make a change !
104	Indiana does not want fracking. Save our state

	D
1	**Personal Message**
105	It is ridiculous that in 2020 coal is still being mined, the Earth is being destroyed, and people are being harmed because Duke doesn't want to do the easy work of transitioning to solar, wind, and nuclear energies and give people the training for safe job transitions! Coal powered energy harms everyone across the board and a better way is possible!!!
106	It is time to look towards the future.
107	It's time to be more environmental minded in everything we do.
108	It's time to move away from fossil fuels - put your investments in wind and solar instead of fracked natural gas. It will help all of us and advance these technologies.
109	Makes sense to move beyond it, take a lead on the matter. As a consumer I expect that of Duke.
110	No fracking. Alternative sources less harmful please
111	No to any fracking!!!
112	Please do what's right for all of us, including your shareholders.
113	Please start planning for a future for your children.
114	Several members of my family have been affected by the environmental impacts of coal. The emissions, however clean you can get them, still cause harm in surrounding areas. Many of the communities around coal plants are low-income or farming communities that suffer GREATLY when air and water quality are poor.
115	Thank you for moving to reduce the coal used.
116	The west coast is on fire, half of our nation is covered in smoke, there's 5 storms in the south right now, and more. It's past time to care about our planet. This isn't "too expensive" as the alternate is the complete corrosion of our planet.
117	We have this one planet. I'm one person doing what I can to help make it last. You are a giant company that needs to do what you can. Please start making BIG changes Now!
118	Why must we continue the same kind of confrontation?
119	Why would we want to pollute the air to obtain a momentary flame.
120	With our state lagging behind on innovation in favor of what works already, its beyond time that Indiana doubles down on its renewable energy efforts. New jobs could be created for men and women attempting to modernize our renewable resources and could make Duke a national frontrunner for energy innovation. Fracking has deadly consequences long term, and land poisoning consequences short term, which makes simple infrastructure like wind farms and solar farms much more attractive from a global and local standpoint.
121	Please, for our children, grandchildren and our beautiful planet move to renewable energy sources!
122	Try renewable energy, instead of ignoring it as a viable alternative.
123	Everyone knows how bad fracking is and regions have moved away from it! C'mon Duke, get current!
124	We need to move to clean energy to save our planet. Please, for our children and all mankind.
125	Dear Mr Pinegar, I know you are not going to pay any attention to what the right thing to do is. I know you will tell your children and grand children some excuse for not doing the right thing. Some BS about jobs and family I suppose. But picture those children in a future time struggling to survive and uninhabitable planet. They will suffer and die because of you and your greed.
126	As a lifelong resident of Indiana, I urge you to adopt clean energy policies.
127	Duke Energy, you're a major player in energy, so lead by example. Think of the legacy you can create and the world you will leave behind for the next generation, our children and our future grandchildren. Let the norm become clean energy, bring profitable while still making a positive impact. Be better than those who say we have always done things this way. Your company will continue to have loyal investors, and will even increase in the number of loyal investors when you make a stand and make a change. I use 100% green energy for my electric and wish I had the same option for my gas. There are those who will choose to do the same as the option is given to them.
128	Go green now can't wait
129	Please stop killing the planet. Harness the sun. Do what is right. You have the power to effect real change. Please don't waste it.
130	Our children's future depends on eliminating fossil fuels! Do you have children?
131	No fracking! Get on board the clean energy agenda.

	D
1	**Personal Message**
132	Times are changing. Let's change to renewable energy!!
133	Be a leader in our clean energy future!
134	Clean energy now!! It's time!
135	Duke Energy prices are too high. Switch to solar or wind. Either is cheaper.
136	Duke has provided reliable electric service but, for the sake of our children, the future CANNOT be powered by coal.
137	I am not too happy about fracking. It seems to cauze earthquakes.
138	Please do not stick your head in the sand to avoid the reality and the dangers of climate change. Our planet depends on us. Our kids depend on us to make good decisions. TAKE POSITIVE ACTION NOW to move away from dependence on fossil fuel.
139	This is so important for us all to have what is best for us financially, and to be healthy.
140	We have used most of our natural resources and need to find alternative resources. Maybe not for but for our children and grandchildren.
141	I am absolutely against COAL & FRACKING IN MY STATE OF INDIANA!! There are NEWER & BETTER WAYS! Please use them for our planet's future & our Grandchildren's future!!
142	Come on Duke. We can do this !! iIt is our respiratory health at risk, especially our children's ???
143	Indiana needs clean energy!
144	Let's continue toward clean energy and new jobs
145	Part of what will make Indiana a desirable place to live and work in the future will be a dedication to clean energy! NO to fracking! NO to coal fired electricity generation!
146	Please dump coal and save our Earth!
147	This matters not only for our current generation but, more importantly, for our children and their children. We need to protect our planet and you, Duke Energy, are dragging your feet!
148	Take leadership and be a company for the future by investing in renewable energy and divest from dirty , harmful gas and coal.
149	The environment is so essential and Duke needs to be on the forefront of leading the way to a cleaner environment. Climate change is a huge problem. Duke needs to be in the forefront of supporting change.
150	Words will always be cheap. If you are serious about your environmental commitment, then you must take bolder actions to mandate less carbon emissions and a stronger emphasis on green energy projects that will produce more permanent manufacturing and maintenance jobs for American workers in the long term.
151	I LIVE IN INDIANA AND I DON't WANT THIS!!! I AM ONE YOUR CONSTITUENTS!!!
152	I urge you to use renewable energy instead of energy produced by fracking. We need to protect the environment.
153	Please reconsider and switch to developing earth friendly energy like solar, wind and wave. Fracking destroys water aquifers.
154	I can't believe you are planning to open fracking plants in Indiana. Please consider renewable energy sources.
155	Indiana has some of the poorest air quality in the U.S. This shouldn't and doesn't need to be the case.
156	Fracking is too dangerous to continue. Please stop. It effects ground water and causes pollution. It is not worth the problems it causes. No more!!!!!
157	It's time to clean up your dirty mess.
158	On a clear day my son can see the smoke coming from the tall stacks at Madison and he lives just south of Seymour. Evidence of pollution going into the air we breathe.
159	Please do the right thing and go renewable by 2030!
160	Renewable energy has been proven to be better for the people and even better financially in Indiana (https://www.forbes.com/sites/jeffmcmahon/2019/07/02/mike-pences-indiana-chooses-renewables-over-gas-as-it-retires-coal-early/#71c0b06943b4). Coal plants in particular harm the residents in the area, so please protect us and create better jobs by switching to renewable energy.
161	It is time to stop taking from the planet. It is the only one we have.
162	It's much too late in world history to be continuing the outdated fossil fuel model of the last centuries. If we are to survive as a habitable planet, we must change our thinking NOW. Please, seriously consider the future of Earth over sheer monetary gain.

	D
1	**Personal Message**
163	Move to renewables!
164	Stop this insanity!!
165	We moved in December and are now customers of Duke Energy. We appreciate the good service. We do not appreciate the amount of pollution in the Ohio Valley now that we are only three blocks from the Ohio River. We do not appreciate the coal barges, even passing each other on the river. We were so pleased to see the Jennings County Library and now the City of North Vernon become solar energy hubs before we left our place near Vernon where we were customers of Southeastern Indiana REMC. Please wake up, please think about the future of our grandchildren and their children and grandchildren. Before it is too late. Duke energy and all corporations who put their share holders before the planet and the future make we who are in our late 70s very sad.
166	By committing to a plan that focuses on renewable energy, you will help to strengthen not only Indiana but the US dependency on energy that is sustainable and clean. As an indiana resident I understand the it's an improbable idea to 100% transition to renewable energy, but I think it would be a great show of resilience and would move the energy sector in the right direction if you did increase the amount of renewable energy in Indiana.
167	Please consider our children and grandchildren and the future they will face if you and others refuse to act now to reduce harmful emissions.
168	Dear Duke Energy Indiana President Stan Pinegar, In October 2019, you told the Franklin County Chamber of Commerce that Duke would diversify from 90% coal-fired plants to more natural gas and renewable sources such as solar and wind. You said that the focus on climate change and the uncertainty about future federal regulation of carbon emissions were driving the switch and Duke would speed up the retirement of two coal plants in Indiana by several years. You said Duke wants to reduce the risk of being heavily coal dependent. The company would phase in renewable energy power and transition selected coal plants to natural gas. Get it done as you said. Get it done by 2030.
169	Air pollution hurts children with asthma; and others with respiratory ailments. Air pollution speeds up global warming/extreme climate change. That affects all of us.
170	Anthropogenic climate change is an existential threat to humanity. We are coming ever closer to the point of no return, and corporations are almost entirely responsible. It's time to at least start to take steps towards protecting our world and protecting our country.
171	As a Regustered Nurse I took an oath to advocate for patients. Fossil fuels poison our world. Do the right thing please. Thank you.
172	Duke needs to get out of the surface of this earth ! Coal is terrible for the environment, coal miners and it is not even a cheaper alternative ! What a scam !
173	Fossil fuel pollution harms our environment and climate. Low-income communities and communities of color suffer disproportionate damage that is especially visible during this unprecedented time of global hardship. Utilities across the state and country are moving quickly to provide customers with inexpensive, clean, renewable energy, while protecting impacted communities and workers in the process.
174	It is important to me that your company takes responsibility for the harms to our environment.
175	It is unacceptable that Duke has not committed to a plan that ensures the safety and well being of the planet for future generations. Keeping coal plants and other fossil fuel burning plants running past 2030 will hold major and devastating consequences. Indiana needs to transition to renewable energy for our future. Climate change is an impending threat - it's not going to be easy to make the changes that we need to make, but we all, Duke included, need to do our part and push ourselves.
176	Let's just do it for each other!!!
177	Mr. Pinegar -- Do you have children? Do you have or hope to have grandchildren?Be a climate hero, PLEASE.
178	No fracking in Indiana!!!!!
179	Our climate cannot sustain much longer if we do not change our ways. Climate change is real and we all need to start acting that way.
180	Fracking causes illusion and earthquakes!

	D
1	**Personal Message**
181	The climate is in a crisis. The time to act is long overdue. Move to renewables to help save the earth. Hi Stan, please let's get on the leading side of attaining renewable energy.
182	Time is running out. It is clear that climate change is creating real problems for maintaining life on this planet. How much more flooding, burning, immigrating can be sustained. I am doing all I can to reduce my carbon footprint,. but it is the gigantic footprint of the fossil fuel industry that needs to be reduced. Individuals alone cannot.
183	To: Stan Pinegar, President, Duke Energy Indiana, As you develop Duke's 20-year energy plan, we, your customers, urge you to take action on the climate crisis: - Move beyond coal before 2030 - Eliminate fracked gas plants from your plans - Transition to 100% affordable, renewable energy before 2030 Fossil fuel pollution harms our environment and climate. Low-income communities and communities of color suffer disproportionate damage that is especially visible during this unprecedented time of global hardship. Utilities across the state and country are moving quickly to provide customers with inexpensive, clean, renewable energy. It is time for you, Duke, to follow suit.
184	We all need & use energy. But! Now is the time to repair damage already done to climate. For the love of lives to come after us please, please eliminate fracked gas from your plans, move beyond coal and toward 100% renewable energy before 2030.
185	We can do better than dirty energy.
186	We need clean energy and not dirty coal/
187	You are full of empty promises. Your customers don't and won't believe you until you give them a reason to, so do the right thing and uphold your words. For our children
188	Continue your focus on solar and wind energy across Indiana. It's a great investment in our state!
189	please embrace the future and help more to fight climate change! We need your help!
190	Please, for our shared future lets move away from coal and all other fossil fuels.
191	We had a coal furnace when I was a kid and it was terribly dirty in our basement, the smoke was black and nasty and then there were the ashes to take care of. How about some nice clean methane digesters producing a clean burning source of energy. We had one on our farm in Michigan. Takes care of the bacteria in the manure, eliminates the smell and produces a nice dirt. Solar panels? Wind generators Lots of good sources of energy and more energy could be produced locally. .
192	Hi There! This issue is particularly important to me because I want my 4 year old daughter to be able to experience the wonders of the world. I want her and my grandchildren to have a planet to live on. Thank you for helping us protect our planet for future generations!
193	Please make this world a better place instead of polluting the environment even more than it already has been and ruining natural habitats of creatures who have just as much of a right to thrive as humans do.
194	This planet is not ours to destroy. Get onboard with cleaner energy. I want my children and grandchildren to be able to breathe without oxygenators.
195	Fracking to extract natural gas not only increases the probability that this potent greenhouse gas will leak and accelerate global climate change. In addition, the process of fracking itself has been responsible for ground water contamination as well as causing serious damage from earthquakes. The extractors tried to claim they weren't responsible for this damage, but the evidence of their culpability became undeniable. Smart fossil fuel companies are turning away from their historic and destructive products to invest in solar and other renewable energy. It is a no-brainer that Duke should do the same!
196	It's beyond time to move to energy methods that are clean, non-.polluting, and incredibly harmful to our health and the environment! Get with it for heaven's sake!
197	No more coal or gas. We need to move to renewable energy yesterday. Climate change hurts indiana.

	D
1	**Personal Message**
198	Please help save our planet.
199	"Do the best you can until you know better. Then, when you know better, do better." - Maya Angelou Recent advertising indicates that Duke is "moving beyond coal." This tells me that you already know better. Yet, the latest 20 year plan doesn't indicate that you are acting on that knowledge, but continuing to heavily rely upon coal. Please make definitive changes for the betterment of our environment and for the benefit of our present and future inhabitants, both human and otherwise. Thank you!
200	After the US suffered over 150 smaller earthquakes the past weekend, and scientists have proven fracking is responsible for more instability underground leading to more earthquakes, it is time to stop this and move to alternative energy resources. Renewable energy sources like solar and wind perhaps.
201	Any further investment in fossil fueled power generation is just plain wrong (and Duke Energy management and board knows it, which makes such negligence deliberately harmful and therefore criminal), since we need to be replacing all such powerplants with renewable solar, wind, heat pumps, energy storage and energy efficient appliances, efficient variable-speed motors, LED lights and other energy conserving devices, to minimize the economic, health and environmental costs of overloading our atmosphere with greenhouse gas pollution.
202	As a Hoosier, we can do better! Be part of the solution and increase your commitment to renewable energy.
203	As a Purdue student I urge you to look back at the actions this company has taken that cannot be reversed. Times are moving forward and so should Duke. I encourage you to consider the people over profit.
204	As solar and wind becoming cheaper than coal or natural gas, it becomes crucial for DUKE energy to get with it and move to alternative green energy or be left behind by other utilities or by rooftop solar as more houses, churches, businesses, and government office building go solar!!!
205	do something to help. we tired of asking
206	Don't wait until last minute to change things. I hope you fully realize that our planet is dying and you must change now. It took me a while to realize it too.
207	Get ahead of the inevitable switch to renewable energy and succeed in the long run. Make us proud.
208	I desire to leave this planet a clean and healthier place for my children. Coal is destructive to our planet and health. I strive to have cleaner energy, eliminate fracking and transition to cleaner renewable energy!
209	I want a sustainable Earth for my children and grandchildren.
210	I want to have grandchildren some day. With asthma currently affecting two of my children, I hope that we can begin using cleaner energy sources to provide healthier air for further generations.
211	In addition to renewable energy sources, I also believe that newer nuclear technologies may need to be part of the picture , in order to reduce CO2. I also believe natural gas can be part of the portfolio if it is strictly captured from sites where it is currently leaking into the atmosphere (no continued fracking). Thank you for your time and attention to this matter.
212	It is beyond time we join the rest of the country in eliminating coal and transitioning to clean, renewable power. My family members with asthma can't wait. Our climate can't wait. The world can't wait.
213	It makes economic sense for you and your customers in the short and long term. It makes common sense to help prolong our planet.
214	It's time to become good ancestors for future generations!!
215	I've been purchasing green energy for Duke for many years, subsidizing them on my monthly electric bill to support the conversion to solar and wind. I want to see more for my money.
216	Let's commit.
217	Move beyond coal before 2030 - Eliminate fracked gas plants from your plans - Transition to 100% affordable, renewable energy before 2030 Fossil fuel pollution harms our environment and climate. Low-income communities and communities of color suffer disproportionate damage that is especially visible during this unprecedented time of global hardship. Utilities across the state and country are moving quickly to provide customers with inexpensive, clean, renewable energy, while protecting impacted communities and workers in the process.

	D
1	**Personal Message**
218	Move forward into the future and welcome it - you'll either be dragged along or be a leader.
219	My faith leads me to point out that it is well past time for utility companies to move rapidly to renewable energy. We have less than 10 years to reduce our carbon emissions by 45%. This means Duke Energy must be a part of the effort to reduce emissions by eliminating coal in the next few years.
220	My frustration is at a peak with Duke, the coal industry and the Indiana legislature. We must focus on our future energy uses, and how it can be can be done sustainably without damaging our health through bad air, water, and land pollution.
221	NO fracking!!
222	Our communities deserve clean reliable energy. Please move away from coal and towards energy that is safe to use and safe for the communities its made in.
223	Our future depends on this, and companies such as yours are the biggest polluters. It is our responsibility to let you know what we want, and this is it! It is your responsibility to listen. Will you listen to your customers and contribute towards a better future for all?
224	Please do the responsible thing and think beyond the bottom line. This is for everyone.
225	Please please do what you can to protect the future for everyone and everything on our planet. You are in a position to do way more than the average person. Please use this power for the good of all.
226	Please! Fossil fuel free by 2030! It matters.
227	Renewable energy 100% asap
228	Renewable energy is cheaper in the long run because you won't have to pay an increasing cost to drill for more obscure oil
229	Renewables are already cheaper, especially with Biden moving to end fossil fuel subsidies, I'm also a fan of dodging climate apocalypse.
230	Seriously? Who did this anymore? Don't you have kids or grandkids you want to have a nice planet to live on?
231	Stop this assault.
232	Stop using coal, our future depends on it!
233	That's my state they're proposing to f*ck up with fracking.
234	The time is now!
235	There are so many downsides to both coal and fracking, and there are so many upsides to clean energy sources. Clean energy offers a reliable energy source to providers, great jobs for workers, and financial & health benefits to consumers. It's truly a win-win-win situation! Please do NOT use dirty energy when we're facing a global emergency! My family has breathing problems that are worsened by air pollution, so this is very personal. Thank you for listening and I hope you will take positive action.
236	there can be no healthy people on a sick planet. do your part
237	This matters because the future of our environment is crucial. We need to make sure we are using as sustainable energy practices as we can, to protect the future of our planet.
238	This matters to me because it is my generation's future!
239	To Stan Pinegar: Duke Energy has shown through past projects that it fails in planning, delivery, safety and financial constraint. WE THE PEOPLE DO NOT WANT NOR NEED ANY MORE DUKE PROJECTS. NO FRACKED GAS PLANTS. NONE. WE WANT AFFORDABLE, RENEWABLE ENERGY. NOW. Duke, as you are is a dinosaur, an out of control, failed planner, manager, self-controlling business, utility, Corp, GET OUT DUKE ENERGY. HELLO SUNSHINE!!!
240	We are a Duke customer with solar. Please help our environment and eliminate coal from your energy plan!

	D
1	**Personal Message**
241	We are long-term Duke Energy customers, and we support green energy alternatives. Please think long-term along with your customers and make your energy from non-polluting sources. I'm a Duke Energy customer and owner of a private nature preserve. Your rapid and decisive action towards moving to renewable fuels will serve as an example to others. Thank you for being a leader in this fight for our children's future. Mark
242	We have a narrow window to ensure that your grandchildren don't curse your name, and all of our names for not saving the only known habitable world in the universe for human life. Do what you need to. Make the next meeting awkward. It will be tougher to do what is needed, but that is how it always is. I believe Duke is up to the challenge if they put their mind to it. The only other option is failure.
243	We need to transition to clean energy. Faster the better. Surely you can find a profitable way to transition your electricity production from fossil fuel sources to clean energy sources. Other utilities are.
244	You are only ruining the health of millions of Hoosiers. No biggie.
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August 17, 2021

Stan Pinegar
Duke Energy Indiana
1000 E Main St.
Plainfield, IN 46168

Re: Duke Energy Indiana's 2021 Integrated Resource Planning Process

Dear President Pinegar,

As state, municipal, and county leaders and Duke Energy Indiana (DEI) customers, we ask that DEI present us with a significantly improved Integrated Resource Plan in 2021. Duke is lagging behind all other Indiana electric utilities in terms of transitioning away from fossil fuels to clean energy, unnecessarily driving up customer costs with expensive, wasteful coal-burning and hindering our ability to mitigate the impacts of climate change on our communities.

The cities of Lawrence, West Lafayette, Carmel, Bloomington, Greencastle, Richmond, and Terre Haute have all committed to climate action by passing resolutions to reduce their carbon footprints in recent years. Our cities cannot meet our commitments to reduce the impacts of pollution and the climate crisis as long as Duke continues to depend on fossil fuels.

Within your current 20-year energy planning process, you have an opportunity to:

- Put your Gibson Super Polluter coal-burning power plant on a path to retirement by 2030
- Stop burning coal at the costly Edwardsport plant immediately
- Replace them not with massive gas plants, as proposed in your last plan, but with energy efficiency, demand response, renewable energy from the wind and solar, and energy storage.
- Give energy efficiency primary consideration in your planning process
- Include rapid construction of renewable energy in your five-year plan.

We would like to see clean energy projects built in our communities as soon as possible.

We also ask that Duke address the energy burden of low-income members of our communities - a burden disproportionately borne by communities of color - who pay a much larger share of their income on energy bills, putting them at a higher risk of shutoffs. Consumer advocates recommended specific measures to reduce the burden on low-income customers in DEI's last rate case and you should follow their recommendations.

All of Duke's coal ash impoundments in Indiana are sitting in groundwater. Duke needs to handle its toxic coal ash cleanup in Indiana as thoroughly as it is in North Carolina - by excavating, encapsulated beneficial reuse only and moving the waste to an upland lined landfill to ensure Indiana's water resources are protected from coal ash.

Sincerely,

Mayor James Brainard, Carmel
Mayor John Dennis, West Lafayette
State Senator Ron Alting
State Representative Sheila Klinker
State Representative Chris Campbell
State Representative Matt Pierce
State Representative Shelli Yoder
Carmel City Councilor Miles Nelson
Carmel City Councilor Tim Hannon
West Lafayette City Council President Peter Bunder
West Lafayette City Council Vice-President Gerald W. Thomas
West Lafayette City Councilor Shannon Kang
West Lafayette Councilor Kathy Parker
Bloomington City Councilor Matt Flaherty
Bloomington City Councilor Isabel Piedmont-Smith
Bloomington City Councilor Sue Sgambelluri
Monroe County Commissioner Penny Githens
Monroe County Councilor Cheryl Munson
Monroe County Councilor Kate Wiltz
Tippecanoe County Councilor Lisa Dullum
Westfield City Councilor Cindy Spoljaric
Wabash Township Board Member Brendan Betz
Wabash Township Board President Angel J. Valentín

August 26, 2021

Via Electronic mail

Stan Pinegar, President
Duke Energy Indiana
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Re: Comments of Sierra Club on Duke Energy Indiana 2021 Integrated Resource Planning Workshop 5A on August 4th, 2021

Dear Duke Energy Indiana IRP Team:

This letter is submitted on behalf of Sierra Club in response to Duke Energy Indiana's (DEI) August 4th IRP workshop. The IRP process and the participation of stakeholders is an important opportunity to proactively shape the state's energy future. Our comments are intended to support DEI's efforts towards developing a clean, reliable, and low-cost energy system for Indiana customers.

I. DEI's 2021 IRP presents DEI with an opportunity to be proactive in the face of a changing energy landscape.

The Midwest Independent System Operator (MISO) shared a presentation at DEI's 5th IRP Stakeholder Workshop held on August 4th, 2021. The presentation focused mainly on two issues: (1) the challenges of managing reliability in the face of increasing extreme weather events (especially in the winter); and (2) the impact that the projected growth in renewable energy will have on the MISO system. It is reasonable for DEI to consider these issues during the IRP process – DEI will face similar challenges to those faced by the larger MISO footprint in the coming decades as the climate continues to change and the electricity system evolves.

But these two issues identified by MISO are largely distinct from each other. Specifically, the increased penetration of renewables on the grid did not cause or drive the blackouts experienced in the winter of 2021, nor does the continued trend towards higher renewable adoption directly threaten winter reliability. Rather than fighting the uptake of low-cost renewables, battery storage, and demand-side resources, DEI should be asking what their systems need to integrate the impending increase of low-cost renewables. And rather than overbuilding fossil resources in response to winter weather events, DEI should be asking how to make the system more robust and reduce the harm and impact to people when there are extreme weather events.

While these two issues are distinct, critically there are many win-win solutions that can address both concerns simultaneously. We view the 2021 IRP as an opportunity for DEI to proactively manage these issues and to begin to adapt and evolve its system.

II. DEI should design its energy system looking to the future, not the past.

MISO's presentation made clear that the energy system of previous years does not reflect the energy system of the future. Renewable energy represents approximately 13% of the current capacity mix in MISO.[1] The recent MISO futures study projects that renewable energy will increase to between 38% and 58% of MISO capacity by 2039, with a higher percentage of renewable builds taking place between 2021 and 2030.[2] MISO also states that the increase in renewables is creating localized risks to the electricity system, and that local risks could eventually become system-wide risks once renewables reach 30 percent of MISO's system.[3]

But DEI is nowhere near the 30 percent renewable level indicated by MISO as a threshold for re-thinking the system. Right now, only 0.51 percent of DEI's firm capacity comes from renewables, and there have been no indications during the IRP process so far that DEI is planning to aggressively shift to renewables in the near future.

The challenges of integrating high levels of renewables can be addressed with adequate planning. DEI can, and in fact does have a responsibility, to conduct this planning in a way that looks towards the grid of the future as opposed to the grid of the past. This means moving away from the conventional thinking that governed the centralized fossil system of the past, and moving towards frameworks that accommodates and optimizes planning and operations of centralized renewables, community resources (such as community solar), distributed generation, and demand and load management all together (such as that laid out in the LBNL's 21st Century Energy Policy Task Force Study).

While planning can be a lengthy process, the lack of planning is costly in its own way. Inadequate consideration of new resources and alternative portfolios can saddle ratepayers with aging and costly coal units that lose money on an operational basis and require significant investments to maintain (when options such as securitization could moderate the impacts on both ratepayers and the Company of early plant retirements). Such planning also tends to perpetuate the pattern of concentrating the externalities and impacts of electricity generation in

[1] MISO Presentation, DEI 2021 IRP Stakeholder Workshop 5a on 04 August 2021, Slide 18. Available at: https://desitecoreprod-cd.azureedge.net/_/media/pdfs/for-your-home/dei-irp-2021/workshop-5a/m5-slides.pdf?la=en&rev=8aea63cbec2c46d7a8cf9e92657b62e3
[2] MISO, "Futures Report April 2021," p. 4-7. Available at: https://cdn.misoenergy.org/MISO%20Futures%20Report538224.pdf
[3] MISO, DEI 2021 IRP Stakeholder Workshop 5a, Slide 29.

disadvantaged and environmental justice communities. Inadequate planning can also limit engagement with state and local governments and stakeholders and therefore prevent the type of collaborative engagement necessary to address barriers or new challenges to renewable deployment (such as the utility-scale wind and siting issues Indiana is currently addressing). This can result in short-sighted decisions to build new gas plants that risk becoming expensive stranded assets due to company, city, state, and utility decarbonization targets. And gas plants have their own reliability problems as the winter 2021 events in ERCOT, SPP, and MISO show.

For their part, MISO is already taking steps to address this by conducting a long-range transmission planning process as part of their Reliability Imperative initiative.[4] Transmission is a key asset in a high-renewable future, because it adds geographic diversity to the energy mix and allows areas with high solar and wind generation to contribute to load centers more effectively. MISO also is redesigning its resource adequacy construct that credits capacity based on unforced capacity or UCAP rather than summer rated capacity or ICAP. This is critically not reflected in Duke's current IRP modeling, and will likely result in thermal units receiving higher accredited value than they should. We recommend that Duke model resource accreditation in its IRP to represent its best understanding of MISO's resource adequacy construct, which includes modeling capacity on a UCAP not ICAP basis to avoid biasing the system planning process in favor of thermal resources.

The need to plan for high-renewable systems is vital for entities like DEI because refusing to do so will not stop their adoption. A number of cities and utilities have already passed decarbonization targets. In MISO's footprint alone, 17 utilities have carbon reduction goals of at least 80 percent while five states are considering 100% percent clean energy targets.[5] The Biden administration and U.S. Senate have proposed a bill, currently pending in Congress, to achieve 80% clean energy by 2030. Additionally, the FERC is taking actions at the federal level to pave the way for the reliable integration of distributed resources and storage in wholesale markets, notably with its historic rulings in Order 2222, which allow DERs aggregators to compete in regional wholesale markets, and Order 2222A, which eliminates the barriers for demand response to do the same.

Planning for an electricity grid that considers this level of new renewable generation should take place today, because the process will become more difficult and more costly in the future. In fact, early deployment of renewable resources is incentivized by the Investment Tax Credit (ITC) and the Production Tax Credit (PTC), and a utility that postpones renewable projects might miss out on these tax benefits altogether. DEI develops an IRP every three years and has an important opportunity to fully evaluate the economics of utility-scale renewables and battery storage, energy efficiency and other load management resources, distributed solar PV and other

[4] MISO, "Long Range Transmission Plan Roadmap March 2021," p. 2. Available at: https://legacy-assets.eenews.net/open_files/assets/2021/04/16/document_ew_02.pdf
[5] MISO, DEI 2021 IRP Stakeholder Workshop 5a, Slide 27.

distributed energy resources, and then incorporate all cost effective and achievable levels of these resources into its 2021 IRP. Failing to do so will represent a significant delay that cannot be rectified for several years.

To state the obvious, low-cost renewables are not going away. Recent all-source requests for proposals (RFPs) demonstrate that renewables, and increasingly a combination of renewables-plus-storage, represent the lowest cost energy and capacity resources available to a utility. Notable examples include Xcel Energy Colorado's 2017 All-Source RFP and the Northern Indiana Public Service Company (NIPSCO)'s 2018 and 2019 All-Source RFPs. These procurements resulted in solar, wind, demand-side resources, and hybrid renewable-plus-storage resources emerging as the least-cost options. The winning renewable bids were the most cost-effective options even after accounting for transmission interconnection costs. In fact, the success of NIPSCO's RFP led to the announced retirement of all NIPSCO coal units by 2028 and an integrated resource plan that reduced the cost of the utility's system by $1.1 billion.[6]

In addition to the specific all-source RFP examples listed above, the Lawrence Berkeley National Laboratory (LBNL) released a study in March 2021 that summarizes All-Source RFP results nation-wide from 2011 through 2020 and finds that solar, wind, and storage bids frequently represent the lowest-cost resource options.[7] Sierra Club has previously submitted comment letters to DEI on the opportunity of All-Source RFPs and the key elements of such a procurement. Sierra Club recommends that All-Source RFPs should be:

- Open to all technology types (both supply and demand-side), ownership structures, and resource sizes. Further, it should be open to bids proposing a combination of resources, rather than limited to single resources.
- Clear about any minimum eligibility requirements, and the rationale for the requirements. These include: services needed, system connection requirements, reliability requirements, financial requirements
- Clear about timing of resource needs and responsibility for the costs of grid interconnection.
- Clear requirements for all bidders to provide the information necessary for DEI to accurately and fairly model the bidders' resources.
- Clear about the manner in which the bidders' information will be evaluated and the purpose for which this information is sought.

[6] Herman Trabish, "Xcel's record-low-price procurement highlights benefits of all-source competitive solicitations," *Utility Dive,* 01 June 2021. Available at: https://www.utilitydive.com/news/xcels-record-low-price-procurement-highlights-benefits-of-all-source-compe/600240/

[7] Dr. Fredrich Kahrl, "All-Source Competitive Solicitations: State and Electric Utility Practices," *Lawrence Berkeley National Laboratory,* March 2021. Available at: https://eta-publications.lbl.gov/sites/default/files/all_source_competitive_solutions_20210217_gmlc_format.pdf

- Transparent in the process to ensure affiliates are not treated preferentially, and to allow renewable developers to fairly address pitfalls or correct erroneous assumptions that come up during the process.

III. Valuing the capacity contribution of renewable energy is increasingly important given the recent reliability events in ERCOT and MISO.

The MISO presentation also covered the Arctic Event in February 2021 and other recent resource adequacy challenges. The Arctic Event occurred between 14-18 February, when a spell of acute cold weather increased electricity demand while simultaneously affecting the ability of generators to supply power.[8] MISO relied on last-resort measures, including emergency load reductions, to manage the event.[9] Utilities plan for a one-day-in-ten-year Loss of Load Expectation (LOLE), but it is important to not just focus on preventing a loss of load event but also mitigate their consequences, namely the harm to people in the region, when events occur.

One of MISO's key findings in their Arctic Event report is that adequately rewarding the performance of individual generators, even when not experiencing an extreme weather event, is critical. While generators are always assigned an "installed capacity" megawatt value, they are also credited with a "firm capacity" value that equates to the percentage of capacity expected to be available when called upon. While there are various methods used to determine unit firm capacity values, fossil, nuclear, and hydro resources have historically been assigned firm capacity values close to 100% to represent their ability to dispatch when needed.

However, fossil resources were not available when called upon in recent cold-weather events, most notably during the ERCOT blackouts of February 2021.[10] Frozen gas pipelines, frozen coal supplies, and fossil units that had not been winterized contributed to significant performance failures within coal and gas fleets.[11] Approximately 58% of failed capacity during the Texas

[8] MISO, "The February Arctic Event," p. 4-5. Available at: https://cdn.misoenergy.org/2021%20Arctic%20Event%20Report554429.pdf
[9] MISO, "The February Arctic Event," p. 4-5.
[10] Sonal Patel, "ERCOT Lists Generators Forced Offline During Texas Extreme Cold Event," *PowerMag,* 04 March 2021. Available at: https://www.powermag.com/ercot-lists-generators-forced-offline-during-texas-extreme-cold-event/
[11] Molly Seltzer, "Andlinger Center Speaks: The Texas Freeze and Widespread Energy System Failure," 23 February 2021. Available at: https://acee.princeton.edu/acee-news/andlinger-center-speaks-the-texas-freeze-and-widespread-energy-system-failures/

blackouts was a result of coal and natural gas units that were unable to generate due to fuel assurance problems and winterization failures.[12]

While wind and solar units also experienced outages during the cold weather event, this dynamic is considered during resource adequacy planning because variable resources are given lower capacity values than fossil units. The deadly consequences of the cold weather event in ERCOT were caused by overconfidence in fossil resources, which are assigned a high firm capacity value but failed to prepare for the cold weather and guarantee fuel supplies, as opposed to renewable resources that are already given lower firm capacity values that reflect their intermittency.

Overall, the cold weather events and subsequent blackouts in MISO and ERCOT in February 2021 demonstrate that fossil units are not the critical ingredient of a robust and resilient energy system. There are other avenues towards a resilient grid that is built to mitigate the worst effects of extreme weather (which of course are caused in part by fossil fuel driven climate change). Additional transmission infrastructure can connect supply and demand in a way that adds flexibility and geographic diversity to a region's energy mix. Microgrids and distributed energy resources (DERs) can protect critical locations and individual customers from blackouts, while also reducing the load and peak requirements that utilities need to meet. Energy efficiency and demand response can similarly reduce the impact of blackouts for end-users.

In many parts of the country, solar, wind, and storage are already cost-competitive with fossil units and provide the best energy value to ratepayers. Increasingly, a combination of storage and renewable energy can also provide the best capacity value to ratepayers as well. Because these resources can be deployed in small increments of capacity, building a number of small renewable/storage projects can avoid the need to overbuild and overpay for a new centralized fossil unit. Storage in particular will be a pillar of future energy systems, because it supports the integration of intermittent renewable resources, increases resilience and system flexibility, and also provides a range of critical ancillary services that allow the grid to function. The costs for solar, wind, and storage projects are projected to continue to decline sharply and in combination these resources will contribute to resource diversity and more resilient electricity grids.

* * *

We appreciate the opportunity to engage throughout this IRP process. If you have any questions or would otherwise like to discuss this letter, please do not hesitate to contact us. Thank you for your consideration.

Sincerely,

[12] ERCOT, "Letter to Members of the Texas State Senate and the Texas State House on the February 2021 Cold Weather Event," 04 March 2021. Available at: http://www.ercot.com/content/wcm/lists/226521/ERCOT_Letter_Re_Feb_2021_Generator_Outages.pdf

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VIA EMAIL

Dear Ms. Bredhold:

We thank you, Mr. Mendoza, Ms. Glick, and Mr. Addleton for your letter of August 26. We appreciate you taking the time to articulate your feedback and perspectives on the process and the information shared thus far. We appreciate that intent to support Duke Energy Indiana (DEI) in shaping Indiana's energy future. We agree that this is an important task, and it is one that I focus on heavily taking into consideration the full range of competing demands, and the constraints that we are required to work within.

As context for our response, I would like to remind you and your colleagues of something that we had shared at the outset of this process. DEI and all other regulated utilities in the State of Indiana are required as part of their IRP process to identify and Preferred Resource Portfolio, which has been defined as follows:

> "'Preferred resource portfolio' means the utility's selected long term supply-side and demand-side resource mix that safely, reliably, efficiently, and cost-effectively meets the electric system demand, taking cost, risk, and uncertainty into consideration."
>
> IURC RM #15-06, LSA Document #18-127
> Link (PDF): https://www.in.gov/iurc/files/RM_ord_20181024141710007.pdf

In all our work we are seeking to meet the needs and requirements of our customers and stakeholders within the requirements established by the IURC. Failing to meet any of these objectives puts the proposed IRP as risk of being out of compliance.

With that context in place, I will respond briefly to the points raised in your letter to us.

I - DEI's 2021 IRP presents DEI with an opportunity to be proactive in the face of a changing energy landscape.

We agree with you and are glad that the presentation by MISO was informative and useful. We also agree with you that increased penetration of renewables was not the cause for the blackout. The blackout was caused by severe weather and an overall resource mix that was not able to support the load over the time period of the weather event. It is clear to us that part of the planning in the IRP and part of our obligations to our customers is to ensure that we have a

resilient system and resilient power supply mix that can support our customers across a wide range of anticipated weather events. Clearly, Indiana's policymakers have prioritized those criteria as well. The experiences in the Midwest, as well as the recent event in Texas, California and earlier events in Alberta, Texas and Europe have highlighted the need to ensure that there is diversity of resource types and fuel types in order to provide a system and power supply that is resilient across the range of potential events. So, while we agree with you that the issues identified by MISO are distinct, they are nonetheless heavily interrelated.

I would also like to clarify one point. We believe that it is a mischaracterization to say that I or DEI are fighting the uptake of renewables. This simply isn't true. In our view, renewables are an equally valid and valuable resource to any other resource. Our current IRP from 2018 had over 2000 MW of solar and wind, while also accelerating the retirement dates of our coal plants by an average of 9 years. And, we fully expect progress to be made on the clean energy transition in this current IRP. All resources are considered in the context of meeting the requirements for the "preferred resource portfolio". This means that we look at resources based on their value on a standalone basis as well as how they add or detract from the value of the overall portfolio and how they are expected to contribute reliably to meeting the needs of the customers and our projected loading requirements. Renewable and conventional resources are all examined through the same lens.

II - DEI should design its energy system looking to the future, not the past.

We agree completely that we need to be planning the system for the future and not the past. That is precisely what we are doing. We do look at the past to learn. We use the past for answering questions like the relationship between heat/cold, humidity, duration and load. We see the changing landscape and are planning our delivery systems and power supply based on the needs of the future.

Thank you for the recommendations on the all-source RFP. Those are generally consistent with the approach that we are contemplating, and we will reassess our plans considering your suggestions to see if any changes are needed as a result.

III - Valuing the capacity contribution of renewable energy is increasingly important given the recent reliability events in ERCOT and MISO.

We agree with you that ensuring all resources reflect an appropriate capacity credit is critically important. We continue to work with MISO in evaluating their methodology for assigning capacity credit for different resources and resource types. We believe that this will continue to evolve and as we discussed new resources are generally assigned a capacity credit based on their type, after which the capacity credit is adjusted to reflect the actual operating performance of resource. This is true for all resources regardless of type. We have moved to a unforced capacity or UCAP approach with this IRP and will also provide data on both summer and winter season peaks.

We expect that MISO will reflect on the lessons learned from the Texas event and compare those to what was learned in the MISO event. We will ensure that we are engaged with MISO in this process. While the Texas event certainly provided additional insights it is important to note that the learnings from the MISO event were also illuminating. In the MISO event, conventional resources were able to play a more significant role in mitigating the impacts, in part because the

MISO system anticipates severe cold across all aspects of the supply chain, which apparently was not the case in Texas.

We know that this is a critical area of concern for MISO not only in their role as Market Operator but also in their role as the NERC Reliability Coordinator for the region. As you know, the MISO capacity construct is currently being evaluated, and is not final. However, we have included in the IRP to the extent practical the changes in the way capacity is considered by MISO as a result of its assessment of the Texas event.

We appreciate you taking the time to provide us with this input. We too are glad to have you and your colleagues participate in the IRP process. While we may disagree with each other on certain aspects of the process, we are appreciative for the engagement and you sharing your perspectives with us. It is helpful to us in ensuring that we are seeing a fuller picture as we work through the IRP process. We look forward to seeing you at our next IRP stakeholder meeting and to reviewing any suggested portfolios you may provide.

Respectfully,

Stan Pinegar

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September 8, 2021

Here in Indiana, Hoosiers have very little influence over the sources of electricity that power their homes. This impacts their pocketbook and quality of life - including the air they breathe, the water they drink, and an increasingly challenging climate with which they must contend.

Before the pandemic, Hoosiers were at least able to have direct conversations with their electric utility during Integrated Resource Planning. This allowed everyday Hoosier voices to be heard in the process of determining their energy future. Though public access was already limited — as meetings are held all day, during the work week, and are highly technical — over the past year-plus, that access has been further restricted.

Duke's handling of its 2021 IRP process is a prime example. Duke has shut off web cameras, microphones and the public chat feature since its current stakeholder process began. Only Duke sees what is being said in the chat and by whom. Questions are read and answered by Duke staff only. These are not participatory stakeholder meetings so much as they are Duke-controlled presentations with little opportunity for customer input.

During the pandemic, many organizations have figured out how to improve online meeting spaces. There are plenty of resources for facilitating meaningful online conversations, the creative use of technologies, and preventing "Zoom bombers" for example. Utilities can easily adopt these best practices to truly engage stakeholders in their Integrated Resource Planning processes and ensure they are being heard. Instead, Duke set up a facade of engagement that actually shuts the public out.

Indiana-Michigan Power and NIPSCO's meetings similarly lack elements of transparency, but Duke's process is the most egregious. Utilities are exploiting the fact that the COVID-19 crisis requires remote-only stakeholder participation, and in Duke's case it is transparently an effort to squelch stakeholder questions and comments.

In the interest of transparency and engagement as Duke's 2021 IRP process continues, we ask that Duke allow stakeholders to:

1. View the participants list within the online platform;
2. See all comments and questions in the chat feature;
3. Have the option to be seen on camera;
4. Ask questions aloud if they so choose.

We also note that Duke has throughout this process ignored the IRP rule that states utilities should "develop and publish to [their] website agendas and relevant material for those meetings at least seven (7) calendar days prior to the meeting." As of today (September 8, 2021) we are two days from Duke's next announced meeting and no materials have been posted. And the link to register on the website is for August's meeting.

Moving forward, we also ask that utilities increase transparency and stakeholder participation, and all Integrated Resources Planning meetings apply the following guiding values:

Access: Meetings should be scheduled at times when everyday Hoosier customers can access them, and accommodations should be made for people of all abilities.

Engagement: Meetings should allow plenty of time for stakeholders and customers to ask questions, aloud if they so choose, and receive meaningful answers.

Transparency: Meetings should be announced at least a month in advance so people can have adequate notice and time to prepare. Agendas and materials should be posted at least seven days in advance in line with the IRP rule.

Sincerely,

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VIA EMAIL

Dear Ms. Bredhold:

I am replying in response to the letter of September 8, 2021, signed by you, Amanda Shephard, Dr. Indra Frank, Shannon Anderson, Barry Kastner, John Blair and Leslie Webb.

We understand the concerns that you have expressed, and we agree that transparency and engagement associated with the IRP are critical. We are working hard to achieve those objectives, along with the other objectives of discussing the IRP analysis and our rationale in ways that is accessible to a wide range of participants.

There are a number of points in your letter that I believe require clarification.

1. The access to public being more limited since COVID is factually incorrect. The number of participants in the daylong IRP meetings is several times larger we had previously experienced with in person meetings, even though the in-person meetings allowed for remote access. We are seeing more people participate in the meetings and with a far wider range of views and perspectives. The pre-COVID meetings were largely attended by a consistent group of stakeholders and their technical experts. In the current arrangement we are seeing many more stakeholders, as well as individual customers not affiliated with an interest group. In addition, I am pleased that we have added meetings in the evenings to allow people who work during the day to attend. These meetings have been geared towards stakeholders and customers that are less familiar with the IRP process and how it works. These have been well attended and have generated a high degree of engagement.

2. With respect to the change in format for the most recent meetings, it is correct that we have shifted the format from a very large zoom meeting to a webinar format.
    a. We did this because we found that the previous format was limiting the ability for all stakeholders to engage effectively.
    b. We found that a number of stakeholders did not have the opportunity to pose their questions and that the conversations, and questions and answers, were being dominated by a more vocal subset of the attendees to the meetings, limiting access to all stakeholder to get their questions out and answered.
    c. The shift allows all stakeholders to pose questions through the Q&A box, and these questions and corresponding answers are ALL visible to ALL attendees.

We know this to be true because in many cases stakeholder attendees are voting up questions with the "thumbs up" feature and they are often answering each others' questions via the Q&A function. The value of the having the questions posed in this manner is that it allows the Duke Energy experts, who are supporting the IRP process, to answer the questions in writing in real time for those that pose the questions. The question and answer log is then added as part of the record of the meeting. Using this process we find that we are able to address several times more questions that we were even asked in the previous format. We have also noted that the number of people asking questions is far greater in this format than the previous format.

d. All written questions and all written answers, from anyone attending the IRP meeting webinar, are visible to all other attendees in real time. These are also all included in the meeting summaries provided after the meeting.
e. There are some questions that are read out to the group and responded to by the presenter. This is only about 20% or less of all questions asked. These questions are selected by the facilitators or by Duke Energy personnel as questions that they believe would be useful in providing greater clarification or helping to increase the understanding of the points being made.

3. The public is not shut out. In fact, there is a far greater number of people engaged in this process and the shift to the current format has more than tripled the number of questions that are asked and answered as compared to the previous format where all questions were asked in voice. The data clearly indicates that there is much greater customer and stakeholder input and feedback coming through the current process than from any method we have used previously. The polling we did at the end of the last meeting indicated high degrees of satisfaction with the overall meeting.

We have considered your first set of requests and have provided our initial feedback below:

1. View the participants list within the online platform;
    a. This is a limitation of the platform we are using for the meeting. We will investigate what is possible here within the limits of individual privacy rights.

2. See all comments and questions in the chat feature;
    a. Participants already can see all questions asked, and who has asked them. All participants can already see all the answers to the questions, including who has answered, even when they are answered by other participants.

3. Have the option to be seen on camera;
    a. This is currently a limitation of the platform that we are using. We will investigate what we can do to make this possible.

4. Ask questions aloud if they so choose.
    a. This has been done in the past when requested by a stakeholder or when Duke Energy needed additional clarity on a question asked. Stakeholders can raise their hand or ask to speak on a written question. We will work with the facilitation team to ensure that they have good protocols in place so that asking questions aloud does not limit the ability of the Duke Energy team to cover the material within the timeframes and that it does not result in the shutting down or limiting the input and questions of the full body of stakeholders attending.

Duke has not ignored the IRP rules, and to assert that we are simply ignoring them is not accurate. We have worked hard to keep within them and have explained to the stakeholders, throughout the process, the challenges that exist in trying to simultaneously meet these requirements while also expanding the range of analysis to meet specific requests of stakeholders, and stay on the original schedule that we had committed to. We have sought and thought we had received concurrence from the stakeholders that it was a higher priority to include more analysis, as requested by stakeholders, and that it was acceptable that there would be compression on the schedule and the ability to provide materials in advance. In this IRP process we are undertaking far more analysis than had been done in the past, in part because of the growing number and availability of resource types, in part because of a widening range of possible futures that need to be modeled and in large part because of Duke Energy's commitment to model scenarios and portfolios that are specifically requested by stakeholders. We will redouble our efforts to meet those requirements, although this could result in a need for us to revisit our ability to model and analyze portfolios requested by stakeholders. This represent a significant amount of work that is complicated by the needs to assess what else will be changing in a highly fluid market. This is easily the most complex IRP environment that Duke Energy Indiana has had the opportunity to study.

With respect to your final set of requests, we offer the following responses:

- **Access**: Meetings should be scheduled at times when everyday Hoosier customers can access them, and accommodations should be made for people of all abilities.
    - We have done this. We have scheduled meetings at multiple times in the day to accommodate the need to have stakeholders, commission staff and other interested stakeholders attend. This includes both meetings during the day and meetings in the evenings. We note that the daytime meetings, held virtually have generally resulted larger numbers of attendees 70-100+, while the evening meetings have generally been significantly smaller in number.
    - The meetings are specifically designed to address a wide range of technical understanding and technological ability.

- **Engagement**: Meetings should allow plenty of time for stakeholders and customers to ask questions, aloud if they so choose, and receive meaningful answers.
    - The meetings are currently designed to ensure that there is time to allow all attendees to ask questions and to have their questions answered in a manner that is not rushed and is responsive.
    - As we committed to above, we will continue to allow people to ask questions aloud and to ensure that this does not diminish the ability of every stakeholder to ask their questions and have their questions answered.

- **Transparency**: Meetings should be announced at least a month in advance so people can have adequate notice and time to prepare. Agendas and materials should be posted at least seven days in advance in line with the IRP rule.

    There is limited time between now and the November 1 filing deadline. We will present tentative dates for the remainder of the meetings tomorrow. We will endeavor to provide the slides 7 days in advance but ask for understanding in the event that we cannot accomplish that goal along with ensuring that the analysis we present is comprehensive and has been subjected to quality control.

I have asked the facilitator team to connect with you and your colleagues to ensure that you all have visibility to the full set of questions, answers and conversations among the stakeholders and between stakeholders and Duke Energy Indiana personnel in the webinar scheduled for tomorrow.

Respectfully,

Stan Pinegar
President, Duke Energy Indiana

Hoosier Environmental COUNCIL

3951 N. Meridian St., Ste. 100, Indianapolis, IN 46208
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6 October, 2021

Scott Park
IRP Leader
Duke Energy Indiana

Dear Mr. Park,

We are writing on behalf of the Hoosier Environmental Council with a request regarding Duke Energy Indiana's 2021 Integrated Resource Plan (IRP). The IRP Stakeholder meetings have made it clear that there are many issues taken into consideration in the process of determining the plan for future energy production. One issue that has not been discussed in the IRP, so far, is the waste produced when coal is used as a source of energy and the short- and long-term implications of that waste.

A choice to continue using coal means continuing to deal with the waste. In this letter we have assembled information on the quantity of coal ash Duke currently produces in Indiana, the disposal costs, and the risks of coal ash damage to natural resources that could become a cost for society.

There are other energy sources that do not create a toxic byproduct with long-term consequences. As Duke Energy Indiana develops the 2021 IRP and establishes plans for the company's future energy sources, we urge you to take all of the costs of generating coal ash into account and rapidly phase out coal in the preferred resource portfolio.

Burning coal creates a large amount of waste

Duke Energy Indiana continues to use coal at its Cayuga, Gibson, and Edwardsport plants. Coal combustion at Cayuga and Gibson leads to the generation of fly ash, bottom slag, and flue-gas desulfurization waste, which are referred to collectively as coal ash or coal combustion residuals (CCR). CCR contains leachable heavy metals that contaminate water, so safe disposal is critical. Despite the power plant retirements in recent years, Duke Energy Indiana (DEI) is still burning enough coal to generate more than 1.4 million tons of coal ash per year.

Quantity of coal-related waste from Duke Energy Indiana[1]

	Tons of waste produced in 2018	Tons of waste produced in 2019	Tons of waste produced in 2020 (early data)
Cayuga	599,900	417,900	548,900
Gibson	1,918,800	1,027,200	1,001,100
Edwardsport	312,100	312,500	246,600

For every 10.8 megawatts of coal-based electricity produced in 2019, DEI also produced one ton of coal ash[2].

Coal gasification at the Edwardsport plant creates a waste called gasification slag. Gasification slag is considered to have lower environmental risks[3]. It must be collected, transported, and either sold for reuse or landfilled. The Edwardsport plant is generating around 300,000 tons of gasification slag per year[4].

Environmental and Health Risks from CCR

If not handled properly, coal combustion residuals or CCR can create dust hazards, catastrophic spills, contaminated land, and contaminated water. Dry CCR that becomes air-borne during handling or transportation creates a dust hazard because particles in coal ash can be as small as 1 micron.[5] At that size, the particles can be inhaled deep into the alveoli of human lungs. Fine particulate matter at that size is well documented to exacerbate both respiratory and cardiovascular diseases.[6]

CCR spills happen when coal ash disposal sites fail and release the ash onto the landscape and into waterways. Coal ash released into waterways can damage aquatic life through the contaminants it adds to the water and by smothering habitat[7]. There have been a number of costly examples. A coal ash impoundment at the Eagle Valley Generating Station in Indiana failed twice in 2007 and 2008 releasing a

[1] Waste data were obtained from the US Energy Information Administration, Form EIA-923, Schedule 8
[2] US Energy Information Administration, Form EIA-923
[3] National Energy Technology Laboratory. *Major Gasification Solid Byproducts.* https://netl.doe.gov/research/Coal/energy-systems/gasification/gasifipedia/solid-byproducts
[4] US Energy Information Administration, Form EIA-923, Schedule 8
[5] Electric Power Research Institute (2009). Coal Ash: Characteristics, management and environmental issues.
[6] Romieu, I. Hernandez-Avila, M. and Holguin, F. (2011). Outdoor Air Pollution. Chapter 6 in Occupational and Environmental Health, Levy, B, Wegman, D, Baron, S, and Sokas, R editors.
[7] U.S. EPA (March 2014). *Response update: Eden North Carolina Coal Ash Spill.* https://www.epaosc.org/sites/9065/files/Eden%20NC%20Coal%20Ash%20Spill%20info%20update%203%20Final%20030614.pdf

total of 60 million gallons into the White River[8]. None of that ash was ever recovered[9]. In 2008, 1.1 billion gallons of coal ash spilled from an impoundment in Kingston, Tennessee. It covered 300 acres[10] with sludge up to 6 feet deep[11] and destroyed 12 homes[12]. Fortunately, no one was killed during the spill, but many of the cleanup workers became sick and 40 died from causes believed to be linked to working on the ash[13, 14]. The spill entered rivers that were sources of drinking water and caused a major fish kill[15]. The Kingston coal ash cleanup cost Tennessee Valley Authority (TVA) ratepayers a total of $1.2 billion[16].

In 2014, 39,000 tons of ash spilled from an impoundment at Duke Energy's Dan River Generating Station into the Dan River in North Carolina and was carried downstream as far as Kerr Lake in Virginia, 70 miles downstream[17]. Duke Energy initially entered into a $3 million agreement with the EPA[18]. A year later, Duke Energy was required to pay $102.2 million in federal fines and restitution for multiple Clean Water Act violations including the Dan River spill[19]. A report in 2015 listed that Duke had paid $20 million in clean up costs, $237,000 in reimbursements to the state of North Carolina, and a $2.5 million settlement

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[8] Commissioner of Department of Environmental Management v. Indianapolis Power and Light Co., Agreed Order, Case No. 2007-16780-W, 2008-17693-W, April 18, 2008. IDEM Virtual File Cabinet document #56808632

[9] Indianapolis Power and Light (May 2009). Response to U.S. EPA 104(e) Information Request to Indianapolis Power and Light Company ("IPL") - Eagle Valley Generating Station.

[10] Satterfield, J. (December 2018). TVA coal ash spill: 5 things to know on 10-year anniversary. *Knox News.* https://www.knoxnews.com/story/news/crime/2018/12/20/tennessee-coal-ash-spill-2008-kingston-tva-workers-dying/2333814002/

[11] (March 2019) *Kingston coal ash disaster still reverberates 10 years later.* https://www.southernenvironment.org/news-and-press/news-feed/kingston-coal-ash-disaster-still-reverberates-10-years-later

[12] (2009, May) The Lasting Damage of the Tennessee Coal Ash Spill. *Scientific American.* https://www.scientificamerican.com/article/tennessee-coal-ash-spill/

[13] Bourne, J.K. (Feb, 2019). *Coal's other dark side.* https://www.nationalgeographic.com/environment/2019/02/coal-other-dark-side-toxic-ash/

[14] Satterfield, J. (2019). TVA admits potential liability in case of sickened coal ash workers, may hit ratepayers https://www.knoxnews.com/story/news/crime/2019/02/05/coal-ash-spill-sick-workers-tva-liability-jacobs-engineering/2733792002/

[15] (2009, May) The Lasting Damage of the Tennessee Coal Ash Spill. *Scientific American.* https://www.scientificamerican.com/article/tennessee-coal-ash-spill/

[16] Satterfield, J. (2018, December). TVA coal ash spill: 5 things to know on 10-year anniversary. *Knox News.* https://www.knoxnews.com/story/news/crime/2018/12/20/tennessee-coal-ash-spill-2008-kingston-tva-workers-dying/2333814002/

[17] Complaint filed in United States of America; The State of North Carolina; and the Commonwealth of Virginia, Secretary of Natural Resources v. Duke Energy Carolinas, LLC., U.S. District Court Middle District of North Carolina (2019) Civil Action No. 1:19-cv-707.

[18] U.S. EPA (March 2017).*Case Summary: Duke Energy Agrees to $3 Million Cleanup for Coal Ash Release in the Dan River* https://www.epa.gov/enforcement/case-summary-duke-energy-agrees-3-million-cleanup-coal-ash-release-dan-river#site

[19] CBS News (May 2015). *Duke Energy fined $102 million in coal ash spill.* https://www.cbsnews.com/news/duke-energy-fined-102-million-in-coal-ash-spill/

to the state of Virginia[20]. One study estimated the total ecological, recreational, human health, property value, and aesthetic cost of the Dan River spill at $295 million[21]. Duke Energy published its own study and concluded there was no evidence of ecosystem damage[22]. However, assessments by North Carolina, Virginia, and the U.S. government found significant damage to natural resources that led them to file a suit against Duke Energy in 2019[23].

Even without a spill, CCR can contaminate land and water because it contains toxic heavy metals. Among the 15 coal ash disposal sites in Indiana with groundwater monitoring under the federal CCR Rule, all but one have contaminated the groundwater rendering it unfit for use as drinking water with varying combinations of antimony, arsenic, boron, cobalt, lead, lithium, molybdenum, radium, selenium and thallium[24]. These metals do not biodegrade, so they are long-term pollutants.

The Town of Pines, Indiana, is an example of soil contamination by coal ash. In past decades, coal ash was used extensively as road bed and landscaping fill throughout the town. Discovery of contaminated wells in the early 2000's eventually led to investigation of soil on residential properties. The utility, NIPSCO, had to remediate many properties by removing soil with high levels of arsenic and other metals and replacing it with clean soil[25].

Given the risks from coal ash – dust hazards, spills, and soil and water contamination – safe handling and disposal are essential.

Short-term Costs of Disposal

Safe disposal of coal ash that is protective of human health and the environment requires steps to control dust hazards, prevent spills, and prevent soil and water contamination. For many decades, disposal of coal combustion residuals was exempt from most waste handling laws, so utilities disposed of it in the least expensive manner. Inexpensive disposal methods led to externalized costs imposed on society in the form of contaminated water and spills[26]. Eventually, documentation of coal ash hazards triggered EPA's writing the Coal Combustion Residuals Rule (CCR Rule), which went into effect in 2015[27].

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[20]Henderson, B (April 2015). Duke Energy to pay Virginia $2.5 million for Dan River spill. *Charlotte Observer* https://www.charlotteobserver.com/news/local/article17313746.html

[21]Lemly, D.A. (2015). Damage cost of the Dan River coal ash spill. *Env Pollution* 197, https://doi.org/10.1016/j.envpol.2014.11.027

[22] https://www.duke-energy.com/_/media/pdfs/our-company/ash-management/dan-river-ltmp-report.pdf

[23] US, NC and VA vs Duke Energy (2019). Civil Action No. 1:19-cv-707

[24] HEC compiled the utilities' groundwater data into a report, *Our Waters at Risk, Part 2: The Impact of Coal Ash on Indiana's Water Resources,* available at https://www.hecweb.org/wp-content/uploads/2020/11/Our-Waters-at-Risk-Part-2.pdf

[25] US EPA (Sept 2016). Town of Pines Superfund Site, Record of Decision. https://semspub.epa.gov/work/05/508886.pdf

[26] EPA (2007). *Coal Combustion Waste Damage Case Assessments.*

[27] https://www.epa.gov/coalash/coal-ash-rule

The CCR Rule imposes requirements for controlling dust and for disposal that reduces the risk of spills and soil and water contamination.

Because of the federal CCR Rule, Duke Energy Indiana has had to make significant changes in handling and disposal of coal ash. Since 2015, the company has implemented dry ash handling and dust control plans, and shifted to landfilling the majority of its ash. The Gibson South Landfill alone is receiving an average of more than 2,000 tons of coal ash per day.

Duke Energy Indiana Disposal of CCR in 2019 [28]

	Landfilled (tons)	Used on site (tons)
Cayuga		417,900
Gibson	750,900	276,300

Going forward, any coal ash generated by Duke will have disposal costs and those costs are higher than they used to be prior to the 2015 federal CCR Rule. Duke has reportedly estimated that dry ash handling costs 185% more per ton than the former wet disposal in impoundments[29].

Short-term disposal costs for coal ash include controlling dust, transporting the ash, placement in the landfill or on-site use location, control of run-on and run-off stormwater, construction of cover over the ash, collection of leachate that forms in the ash, and treatment and disposal of the leachate. The leachate alone can be a significant disposal burden. In 2020, the Gibson South Landfill generated more than 69 million gallons of leachate[30]. As disposal facilities reach capacity, there is also the cost of constructing expansions for the landfills. Though the IRP stakeholder process has not included discussion of coal ash costs, these short-term disposal costs for coal ash need to be incorporated into Duke's modeling of the future use of coal.

Long-term Costs of Coal Ash Disposal

Given the enduring nature of the heavy metal contaminants in coal ash, disposal solutions for coal ash must be stable and permanent, so there are long-term costs associated with generating coal ash. Coal contains trace heavy metals that are more concentrated in the coal ash after the carbon has been burned off. Depending on the source of the coal, coal ash contains a variable mix of antimony, arsenic, boron, hexavalent chromium, cobalt, lead, lithium, mercury, molybdenum, radium, selenium and

[28] US Energy Information Administration, Form EIA-923
[29] John Downey (Dec 6, 2019). What insurers allege about Duke Energy's knowledge of coal-ash risk at Mayo plant, *Charlotte Business Journal*
[30] O.Schwartz (March 1, 2021). Gibson Station South Landfill Leachate Generation Report. VFC doc # 83121347

thallium[31]. Some wastes breakdown into harmless degradation products over time, but this is not the case with coal ash and the heavy metals it contains. Over time, these metals can shift between chemical forms or be moved around by wind or water, but they do not break down or disappear. This makes coal ash a forever pollutant.

The federal CCR Rule takes the long-lasting nature of coal ash into account, to an extent. After a disposal site stops receiving coal ash, the Rule requires closure, which involves either excavating and removing the waste to a safer location or -- if site conditions allow -- leaving the ash in place by constructing a final cover system over the ash and implementing other measures to ensure protection of ground and surface waters. Specifically, the final cover and other measures must prevent stormwater and groundwater from infiltrating into the waste and coal ash contaminants from leaching into the groundwater or running off to nearby surface waters.[32]

The Rule also requires that coal ash disposal sites monitor groundwater to detect any release of coal ash contaminants. If a release is detected, the Rule requires corrective measures to prevent further releases and address the contaminated groundwater[33]. The maintenance of the final cover over the ash, collection and treatment of leachate, and monitoring groundwater are required for 30 years after closure; and may continue thereafter if there is ongoing groundwater contamination at the 30-year mark[34].

Any coal ash Duke Energy Indiana generates in the coming years will be subject to these long-term requirements of the CCR Rule and the costs of those requirements. Those costs must be taken into account in the IRP. Groundwater contamination has already been detected at Cayuga and Gibson, so the process of assessing and implementing groundwater corrective measures and closure is already under way for coal ash that was disposed of in the past. If DEI elects to continue burning coal and generating coal ash, the future disposal sites are at risk of also contaminating groundwater and needing corrective measures and closure, as well. Therefore, the cost of future groundwater corrective measures should be considered in the IRP.

Long-term Costs Beyond the CCR Rule

Unfortunately, coal ash lasts indefinitely and could generate significant costs to society well beyond the 30-year regulatory window from the CCR Rule. Those costs would be in the form of damage to natural resources from spills and water contamination. After 30 years, maintenance of the disposal structures (impoundments and landfills) is no longer required, unless there is still ongoing groundwater

[31] Electric Power Research Institute (2006). *Characterization of Field Leachates at Coal Combustion Product Management Sites.*
[32] 40 CFR § 257.102
[33] 40 CFR § 257.90 through 257.98
[34] 40 CFR § 257.104

contamination at that time. At Duke's Cayuga and Gibson plants, the coal ash disposal structures are at risk once maintenance ends due to their location and construction.

The Gibson Station is located in the New Madrid and Wabash Valley seismic zones, which increases the risk of a spill in the future. AECOM performed a seismic evaluation of the Gibson landfill and recommended modifications of the perimeter embankments[35]. ATC Group Services has written that it plans to follow AECOM's recommendations at Gibson[36], and Duke Energy has certification by a professional engineer that the landfill meets the requirements of 40 CFR 257.64 regarding CCR units in unstable areas[37]. However, there are no guarantees that there won't be releases of CCR during future seismic events, particularly once the company is no longer responsible for site maintenance.

The liner under the newer sections of the Gibson landfill is built to CCR Rule specifications, but seismic forces could disrupt it. In AECOM's seismic evaluation, they qualified their assessment of whether the liner at the Gibson landfill would fail during an earthquake because they did not have access to actual liner materials in order to test them.[38] A failed liner would lead to groundwater contamination.

Coal ash at Cayuga may also be at risk for future release. According to data from the U.S. Energy Information Administration, all of the coal ash generated at Cayuga in 2019 and 2020 was "used on site"[39]. The Cayuga closure plan states that coal ash is being used as structural fill to close the coal ash impoundments in place[40, 41]. Only a minority of the Cayuga coal ash appears to be going into the Cayuga landfill. The most recent Annual Landfill Report shows that only 7,153 cubic yards of coal ash were added to the landfill over the course of a year[42] even though Cayuga is producing on the order of 350,000 cubic yards per year[43]. Therefore, it appears that most of the coal ash currently being produced at Cayuga is being used as fill to close the impoundments. These impoundments hold more than 10 million tons of ash accumulated over multiple decades. They are deep enough that the bottom of the ash is below the water table and saturated with groundwater. Up to 20 feet of the ash is below the

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[35] AECOM (June 25, 2021) Geotechnical Engineering Report Duke Gibson South Aggregate Landfill Expansion Project Revised Seismic Evaluation. Available in Appendix A of VFC doc # 83180925

[36] ATC Group Services LLC (July 9, 2021). Response to Request for Additional Information, VFC doc #83180925.

[37] D. Duffy, P.E. (Oct 9, 2018). Unstable Areas, CCR Landfill: Gibson Steam Station, CCR Unit: Restricted Waste Site Type I Landfill. https://desitecoreprod-cd.azureedge.net/_/media/pdfs/our-company/ash-management/183130/p08-126-gib-unstable-areas-sland.pdf?la=en&rev=e81671b05c9a46e89181aa21a08e22a9

[38] AECOM (June 25, 2021) Geotechnical Engineering Report Duke Gibson South Aggregate Landfill Expansion Project Revised Seismic Evaluation. Available in Appendix A of VFC doc # 83180925

[39] US Energy Information Administration, Form EIA-923

[40] Duke Energy (Sept 2018). Response to Request for Additional Information, Proposed Site Closure Implementation Plan Addendum #1, Duke Energy Cayuga Generating Station Ash Pond System. VFC doc #82623081

[41] (Dec 16, 2016). Proposed Modification to Existing Closure and Post-closure Plan, Ash Disposal Area #1, Cayuga Generating Station. VFC doc #80399269

[42] Duke Energy (Oct 16, 2020). Coal Combustion Residuals Annual Landfill Report, Cayuga Landfill. https://desitecoreprod-cd.azureedge.net/_/media/pdfs/our-company/ash-management/203073/cay-annl-ldfl-lf-2020.pdf?la=en&rev=710e00c783304c47b8a9b6802a9dd496

[43] The EIA data show 417,900 tons of coal ash produced at Cayuga in 2019, and there are approximately 1.2 tons of coal ash per cubic yard.

water table. This saturated ash does not provide a sound foundation for the waste and could lead to failure of the closed structure and release of the ash[44, 45].

Along with their seismic and structural risks for future failure, Duke's coal ash disposal sites at Gibson and Cayuga are located adjacent to the Wabash River, which could threaten their integrity. At Gibson, the South Landfill is located in the 100-year floodplain, as are portions of the coal ash impoundments at Cayuga[46]. Future flood events could damage those disposal structures and allow release of coal ash.

The coal ash disposal structures at Gibson and Cayuga could also be impacted by fluvial processes that cause the Wabash River to shift in its course over time. In 2013 the US Geological Survey published a report on channel migration rates for 38 of the largest streams in Indiana[47]. Where coal ash disposal sites are adjacent to rivers, channel migration could erode into the coal ash disposal structures over time causing release of the ash. The image below, from the cover of the USGS report, illustrates channel migration over a period of just 7 years. The blue arrows point to utility poles.

[44] Hoosier Environmental Council, Sierra Club, Earthjustice, and Citizens Action Coalition. (July 24, 2017). Comments on the Cayuga Generating Station Ash Pond System Modified Closure & Post-closure Plan.
[45] (Dec 16, 2016). Proposed Modification to Existing Closure and Post-closure Plan, Ash Disposal Area #1, Cayuga Generating Station. VFC doc #80399269
[46] Flood Insurance Rate Map (FIRM) accessed at maps.Indiana.edu
[47] US Geological Survey, *Recent (circa 1998 to 2011) Channel-Migration Rates of Selected Streams in Indiana,* Report 2013-5168

The Cost of Natural Resource Damage

Coal ash damage to natural resources has created high cleanup costs in other states. In the Carolinas, Virginia, Tennessee, Illinois, Georgia, and Florida utilities are excavating old, leaking coal ash impoundments that are contaminating groundwater and rivers. In fact, Duke Energy is excavating all of its leaking coal ash impoundments in the Carolinas and either sending that ash for recycling or placing it in landfills on high ground at a cost of more than $100 million per site[48]. A recent legal settlement means that Duke will have to internalize a significant portion of those costs[49].

So far, Duke Energy is not providing the same level of natural resource protection in Indiana as it is in other states when it comes to coal ash cleanup. In Indiana, it is leaving the leaking impoundments in place in flood-prone areas and saturated in groundwater thereby perpetuating the groundwater contamination. In the future, if Duke were held to the same standards in Indiana that it has to meet in the Carolinas, it could face significant added cleanup costs for coal ash.

Data requests

Given the short-term and long-term costs of coal ash described above, we have the following data requests for Duke Energy Indiana's IRP process:

1. To what degree are variable costs of coal ash embedded in Duke Energy Indiana 's unit costs?
2. Do Duke's cost estimates for use of coal include all of the following: coal ash handling, transportation, dust control, placement in the landfill or on-site use location, control of run-on and run-off stormwater, construction of cover over the ash, collection of leachate that forms in the ash, treatment and disposal of the leachate, 30 years of groundwater monitoring, groundwater corrective measures, and 30 years of maintenance and repair of the disposal site cover?
3. To what degree will Duke Energy Indiana need to expand its coal ash disposal systems to accommodate additional years of coal ash generation and are the costs of expansion included in the analysis?
4. Does Duke Energy Indiana have any other anticipated CCR costs yet to be incurred and are those included in the IRP analysis?

Modeling requests

We also request that Duke Energy Indiana reflect all variable costs of coal ash in the unit costs for use of coal. This should include all of the following: coal ash handling, transportation, dust control, placement in the landfill or on-site use location, control of run-on and run-off stormwater, construction of cover over the ash, collection of leachate that forms in the ash, treatment and disposal of the leachate, 30

[48] Direct Testimony of Jon F. Kerin (2017). Application of Duke Energy Carolinas, LLC for Adjustment of Rates and Charges Applicable to Electric Service in North Carolina. Docket no. E-7 Sub 1146, Exhibit 11.
[49] https://news.duke-energy.com/releases/releases-20210125

years of groundwater monitoring, groundwater corrective measures, 30 years of maintenance and repair of the disposal site cover, and expansion of disposal systems.

To the extent that anticipated CCR costs, including the costs of expanding the coal ash disposal system are not included in the IRP analysis, yet, we request that Duke Energy Indiana promptly make the necessary changes to include them.

We request that Duke Energy Indiana take the full cost of coal ash into account in modeling runs in this IRP.

We request that Duke Energy Indiana include the potential for coal ash to cause natural resource damage beyond the 30-year post-closure period in its qualitative considerations for the IRP.

Conclusion

Duke Energy Indiana's current IRP will establish plans for the company's future energy sources. Those plans are naturally affected by cost considerations. The cost of using coal as an energy source includes all of the costs associated with coal ash: coal ash handling, transportation, dust control, placement in the landfill or on-site use location, control of run-on and run-off stormwater, construction of cover over the ash, collection of leachate that forms in the ash, treatment and disposal of the leachate, 30 years of groundwater monitoring, groundwater corrective measures, and 30 years of maintenance and repair of the disposal site cover. These costs apply to a significant amount of coal ash. In 2019, DEI produced a total of more than 1.4 million tons of coal ash.

None of the coal ash costs lead to the production of electricity in and of themselves. They are costs associated with creating a hazardous byproduct during electricity generation.

Coal ash contains toxic heavy metals which do not biodegrade over time, so coal ash is a forever pollutant that must have a permanent solution. Disposal at the Cayuga and Gibson plants may not be leading to a stable, secure, and permanent solution for the coal ash. At Cayuga, ash currently being produced is being added to impoundments where the deepest ash is infiltrated by groundwater, which lowers the stability of the structure. The Gibson coal ash landfill is in the New Madrid seismic zone, and both Cayuga and Gibson are at risk of flood damage from the Wabash Rivedr. If the capped coal ash impoundment or a coal ash landfill fail, they will leave future generations to deal with a spill and contaminated groundwater. In the long run, the cost of using coal includes the potential for future damage to natural resources.

Since coal ash handling and disposal are expensive, and coal ash creates risks for present and future natural resource damage, we urge Duke Energy Indiana to phase out coal as rapidly as possible in this IRP and look toward other energy sources.

Sincerely,

Indra N. Frank, MD, MPH
Environmental Health and Water Policy Director
Hoosier Environmental Council

Tim Maloney
Senior Policy Director
Hoosier Environmental Council

Cc Stan Pinegar
Stewart Ramsay
Karol Krohn
Jeffrey Reed
Bradley Borum
Morgan Pauley
Jeremy Comeau
William Fine
Jim Huston
Jennifer Washburn
Kerwin Olson
Wendy Bredhold

Duke Customers' Petitions to Stan Pinegar, President of Duke Energy Indiana, to Take Action on the Climate Crisis

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The attached spreadsheet contains **1,352 petition signatures (734 new)** from residents of nearly every city and town where Duke Indiana ratepayers live. Of the petition signers, **536 wrote additional personal messages (294 new)** to Stan Pinegar. These signatures and messages represent sustained demand by customers for clean energy since the Sierra Club last delivered the petition in June 2021.

The petition reads as follows:

> As you develop Duke's 20-year energy plan, we, your customers, urge you to take action on the climate crisis.
>
> - Move beyond coal before 2030
> - Eliminate fracked gas plants from your plans
> - Transition to 100% affordable, renewable energy before 2030
>
> Fossil fuel pollution harms our environment and climate. Low-income communities and communities of color suffer disproportionate damage that is especially visible during this unprecedented time of global hardship. Utilities across the state and country are moving quickly to provide customers with inexpensive, clean, renewable energy, while protecting impacted communities and workers in the process.

The following quotes are a sampling of new personal messages that many petition signers wrote:

> "That our planet is endangered by rising temperatures, more violent storms, wildfires and rising sea levels is no longer debatable. Duke Energy must develop renewable sources of energy and eliminate fuel fossils immediately. Every day I worry about the future my children and grandchildren are facing. You have a position of power and influence that enables you to help create positive outcomes for the planet. Please use the resources at your disposal wisely, effectively and QUICKLY! Thank you." **– Marsha, Zionsville**

“I am begging you to move to clean renewable energy. My son and so many other children have asthma and what is put into our air impacts keeps them from living a healthy full life.” – **Jennifer, Fishers**

“Having moved to Indiana from Colorado, where wildfires burn hotter and faster than ever before, I have firsthand seen the destruction symptomatic of climate change. The biggest steps towards mitigation aren't done by consumers recycling aluminum cans, it's done by companies and upstream manufacturing. I urge Duke Energy to move away from coal, which is a leading cause of greenhouse gasses.” **– Abner, Jeffersonville**

Date	Name	City	Email	Personal Message
10/20/21	Edward Johnson	Indianapolis	johnson2245@att.net	Renewable energy is the best long-term way to solve the problems of unhealthy air and climate change.
10/18/21	Terrence Perrier	Bloomington	tperrier@iu.edu	Hi, My name is Terrence and I am a new tenant in Bloomington, IN. As a new customer with Duke energy, I am disappointed to learn of the lack of affordable, renewable energy invested in by Duke Energy. keeping the importance of the future of our community and environment in mind, I ask Duke energy to more actively invest in renewable energy rather than build further fracking gas plants.
10/16/21	Christine Linnemeier	Bloomington	linnosav3@gmail.com	As one of your long time customers, I would like to see you transition to cleaner energy as soon as possible. Carbon emissions are destroying the planet and all of us have to act as quickly as possible to cut these emissions. Individuals can only do so much to solve this problem. It is companies like Duke that can have a real impact by cutting emissions on a large scale and quickly. I would like to leave the Earth in a livable state for my grandchildren. You should want to do this for your own descendants as well.
10/16/21	Renate Kasak	Bloomington	renatekasak@yahoo.com	You are a polluter driven by greed. Do your decision makers have no kids? Or just no conscience? ACT now or be worse than the worst mass murderers in human history. Hitler killed from his desk, so did Stalin. Sleep well.
10/15/21	Cathy Beard	Unknown	beardc@iu.edu	Please work to become the model for Indiana instead of an embarrassing bad example.

10/14/21	Erin Ewart	Unknown	kkpie1@gmail.com	Climate change needs to be drastically addressed on the order of one decade. Minimal changes over two aren't going to cut it. Get on board, before the world burns, and your money with it.
10/14/21	Keith Keller	West Lafayette	kckeller32@gmail.com	Stop killing my kids! Please...
10/12/21	Suellen Woods	Unknown	suellenwoods@sbcglobal.net	Let's put profits and resistance to change behindvus and think about the future of the planet.
10/6/21	Gary Webb	Greenwood	garytntwebb@aol.com	Pursuing fossil fuel energy is ruining the earth for our children and their children.
9/22/21	LAURA Haehner	Unknown	lhaehner@gmail.com	Now is the time to act to save our planet. I bought a PHEV to help but if you don't change where you get our electricity from, then I could be making things worse charging it
9/21/21	KK Sabo	Indianapolis	kksabo123@gmail.com	I want a livable Earth for us and our posterity.
9/19/21	Allison Smith	Noblesville	abell628@yahoo.com	We have an obligation to act now, and it is obvious we need to stop using coal. Please take a leadership role and do what is needed to stop coal for energy.
9/17/21	Lee Mortensen	Westfield	lee.mortensen@gmail.com	Duke needs to move more quickly towards other non carbon emitting energy sources.
9/16/21	Carlies Anderson	Indianapolis	carlies1938@icloud.com	Your practices and policy contribute to Indiana being one of the top polluters in the country. It's time to be a responsible citizen and retire coal run facilities. You are in a position to make a major contribution to the the life of our planet for our ancestors/children and grandchildren.
9/16/21	John Schleeter	Westfield	john.deanna68@comcast.net	Please, Please, Please. The health of all Hoosiers are at risk, especially the health of our children!! It is time. Close coal production and go directly to clean energy.

9/16/21	Amanda Hulse	Carmel	hulse.amanda.b@gmail.com	According to the US Energy Information Administration (EIA), Indiana consumed more coal than 48 other states in both 2019 and 2020. While we appreciate the employees that have worked to provide us with power all these years, we now know without a doubt that the burning of fossil fuels has taken a devastating toll on this shared planet. In order to provide for this generation and future generations, we must transition NOW to renewable energy for everyone.
9/13/21	Ian Dillman	Unknown	idillman@iu.edu	GTFO of Indiana and let me BREATH fresh, clean air!!
9/13/21	Josephine Crowe	Unknown	joseycrowe2421@gmail.com	For our future on this earth
9/13/21	Everett Reese	Shelbyville	everettreese32@gmail.com	Please change this. I wanna have a future.
9/13/21	Serena Owens	Greenfield	piccolo777@yahoo.com	With the advancements being made there's no reason to continue destroying our planet.
9/13/21	Charly Lowe	Unknown	charlylowepiercing@gmail.com	Change now you old farts
9/13/21	Anthony Edwards	Muncie	blakedwards@hotmail.com	Indiana is always the last do make change. Let's stop treating our planet like a mine and treat it like a growable asset.
9/13/21	Kaylan Heck	Lanesville	mamabear7210@gmail.com	Please do something positive with your power
9/12/21	Jeremy Brody	Unknown	jeremydane524@gmail.com	If you stop using coal it will benefit everyone
9/12/21	Melissa Bryant	Unknown	melissabryant97@yahoo.com	I care deeply about our beautiful state and hate to think that we are killing it with pollution. Please make choices that will preserve our state for future generations.
9/12/21	Braiden Gowan	Unknown	braiden019@gmail.com	Look at the world it's falling apart its time to step up and do your part
9/12/21	Lauren Lagoni	Kokomo	llagonilm@grace.edu	I want to live and die seeing the beautiful winters Indiana has so let's make that happen!

9/11/21	Lady Laura Moore	Borden	lolabuny59@gmail.com	I'm a customer of Duke energy & I live in Indiana but if I could get my power from any other source, that I could afford, I would. Duke has the means and abilities to start implementing Solar energy farms, services to assist new & current customers, deferred payment options, compensation programs, financing, and the likes. I know the Federal government or one of the branches there of have subsidies, grants, loans some of a number of programs that would help with off setting Dukes costs and offer tax benefits across the board! So I don't understand why Duke Energy wants to continue to Do Serious and, soon to be, Irreversible Damage to our already Extremely FRAGILE planet. Somewhere in your massive corporate world of power and influence there's been something or someone's that have foreseen this all coming. So there's a plan or theorum out there as to going about alternatives. Right? Right! So let's get a committee or panel moving & START ADDRESSING Getting on board with going GREEN???
9/11/21	William Moore	Borden	cplmoorewt@gmail.com	Time is crucial for us to Implement Planet Saving measures for not only the PLANET but for ourselves & the FUTURE generations that are to come that will have to live here. Duke it's way past time to GET OFF the FOSSIL FUEL & GET ON BOARD with CLEANER, GREENER ALTERNATIVE ENERGY SOLUTIONS.

9/11/21	Markanna Huffer	Kokomo	marcannah@gmail.com	Please move forward! We were promised and we see many solar panels in one field yet our bill continues to be raised. Please help our economy and our planet!
9/11/21	John Solliday	Unknown	sollidayjohn@gmail.com	Science speaks volumes, and that alone should say enough. But Science is not alone. The human race not only needs the change, but we want the change. Allow the heart and conscious within you, to speak louder than the income saved in not changing and help be the part of what saves life on our planet, our home.
9/10/21	Hannah Chenevert	Unknown	hannah.chenevert@gmail.com	Renewable energy is the future.
9/9/21	Nevin DeCoster	Unknown	ndecost@iu.edu	Why are they still using coal...
9/9/21	stephanie blocksom	Unknown	audreyblocksom@gmail.com	Personally, I intend to go to solar power in the next year. I urge Duke to consider making an investment in the planet's future.
9/9/21	Rebecca Creal	Unknown	tiggrdisny80@gmail.com	We're sick of being behind the times. Move forward.
9/8/21	Madi Medley	Unknown	madimedley2004@gmail.com	To: Stan Pinegar, President, Duke Energy Indiana, As you develop Duke's 20-year energy plan, we, your customers, urge you to take action on the climate crisis: - Move beyond coal before 2030 - Eliminate fracked gas plants from your plans - Transition to 100% affordable, renewable energy before 2030 Fossil fuel pollution harms our environment and climate. Low-income communities and communities of color suffer disproportionate damage that is especially visible during this unprecedented time of global hardship. Utilities across the state and country are moving quickly to provide customers with inexpensive, clean, renewable energy, while protecting impacted communities and workers in the process.

9/8/21	Heather Waters	Unknown	heatherwaters1331@gmail.com	Because we can save whats left of our crumbling world! Stop being selfish and lining your own pockets, people like you are the reason we are where we are now!!!! They shouldn't have to do all this to get you people on bored and it's shameful. Greedy...
9/7/21	Selena Hutchison	Unknown	shutch17@icloud.com	My children and generations in the future deserve an environment with clean air and water. We all need to do our part to curtail fossil fuel emissions.
9/7/21	Dawn Miller	Danville	stardeltafire73@yahoo.com	I would like to see Duke moving into a more sustainable, efficient type of energy that would lessen the impact on the environment.
9/7/21	Conner Sturgeon	Richland	connormsturgeon@gmail.com	Growing up in rural, southern Indiana, all I have ever know is the coal use at AEP and I've seen the harm that it has caused my county. I want to see preservation for our future!
9/6/21	Joshua Lofgren	Greenwood	lofgrenjosh@gmail.com	You have the power to affect lasting change. Please do so.
9/6/21	Donald Frederickson	Bedford	dinoguy2000@yahoo.com	Not only are green energy sources vital for the presentation for the environment, they are less expensive than fossil fuels by a large margin.
9/6/21	Ely Cortez	Unknown	trav13za716@gmail.com	I live in Indiana and I also have kids that I need to make sure they have a healthy future.
9/6/21	Mikaila Taylor	Unknown	mikailartaylor@gmail.com	Our Earth dies more and more everyday due to the pollution that fills our skies. Please take action and help mandate a cleaner environment. Change starts with policy. Which starts with you deciding to do something . Please make the right choice.

9/6/21	Solomon Thompson	Unknown	solomon.jpeg@gmail.com	As someone who lives in Indiana I personally see how terrible people and businesses treat our environment of Duke energy made a move to cleaner energy that would be a major example for the rest of Indiana businessman and to the people who live here it's important to think about the long term effects of our actions and need to start making a change for the better of the people on this Earth
9/6/21	Erica Reichert	Unknown	ericareichert77@gmail.com	Stop polluting our state with coal.
9/5/21	Hannah Solomon	Unknown	ihannahleann@gmail.com	Once this planet is done , it's done. We don't get another one ??
9/5/21	Sheila Smith	Unknown	shla1972@yahoo.com	To: Stan Pinegar, President, Duke Energy Indiana, As you develop Duke's 20-year energy plan, we, your customers, urge you to take action on the climate crisis: - Move beyond coal before 2030 - Eliminate fracked gas plants from your plans - Transition to 100% affordable, renewable energy before 2030 Fossil fuel pollution harms our environment and climate. Low-income communities and communities of color suffer disproportionate damage that is especially visible during this unprecedented time of global hardship. Utilities across the state and country are moving quickly to provide customers with inexpensive, clean, renewable energy, while protecting impacted communities and workers in the process.

9/5/21	Anna Wood	Unknown	woodanna7@gmail.com	We all live on this planet. Let's do better for the earth and the future of our children.
9/5/21	Randi poe	Unknown	randicain343@yahoo.com	The evidence of actions and the impact its having on the environment are all around us! Look at the temp in the winter? time to make some changes, before our children have no world to depend on.
9/4/21	Nicholas Noonan	New Albany	nicknoonan420@gmail.com	I don't like Duke.
9/4/21	Joseph Canter	Unknown	josecant@iu.edu	This planet is all we have. Let's not destroy it.
9/4/21	Tommy Weir	Kokomo	goldensatya2020@gmail.com	I have launched my own solar installer company for residential, commercial and government contracts! I have chosen to take full action! I have helped launch a big Renewable energy social media campaign known as We Power America as well! Please contact me for the lowest cost to install Solar and to endorse or sponsor our life changing campaign! 765-434-4678
9/4/21	Arturo Tovar	Unknown	arturotovar628@gmail.com	Please stop the use of coal. My brother lives in florida and with the climate change that is happening with ida. I think it should change and save those resources when we are in dire need.
9/4/21	Gloria Marzke	Unknown	marzkegloria1997@gmail.com	Coal not only is finite but has disastrous consequences for both natural environments and societal communities. Please be the change our state and planet needs.
9/4/21	ellen willibey	Unknown	elleroni36@yahoo.com	the world is dying. we need this
9/3/21	Amber Barnes	Unknown	amberbarnes231@gmail.com	It's time to take the more environmental approach and do what is best to save our planet.
9/3/21	Nancy Tatum	Carmel	penguinet111@gmail.com	All of us deserve a clean planet!

9/3/21	Danila Kourkoulin	Bloomington	dkourkoulin@gmail.com	I'd like my offsprings to experience earth as close as possible to what I did one day instead of a desolate. Worst case scenario we will live in a clean environment. Let's freaking do it already.
9/2/21	Bruce Russell-Jayne	Carmel	brussell-jayne@uuma.org	Stop burning coal!
9/2/21	Sierra Kelley	Unknown	spkelley2382@gmail.com	Clean up
9/2/21	Gabrielle Egan	Terre Haute	gabbydmegan@gmail.com	I want to be proud that my state is doing its best to help reverse and prevent further climate change!! No one likes to hear that they are contributing to a company that pollutes our Earth so much.
9/2/21	Brigitt Nasby	Unknown	brigitt.nasby@gmail.com	Thank you for looking for ways to better the lives of Hoosiers. It's time we take responsibility for how we impact the environment and people around us. I hope you take this as seriously as other Hoosiers as we build a better home for our children and theirs. Please see how much impact you can have on so many lives. New technology can allow for new skills for employees to mitigate job loss. We hope this is something you're already considering and will begin making the urgently needed changes.
9/2/21	Pamela Knowles	Carmel	pknowles1217@gmail.com	Extreme weather conditions have got to stop! The burning of the western states, the hurricanes on the east coast, the extreme heat have all got to stop! And if we all work together we can turn things around. Please do your part.
9/2/21	Tiffani Blackburn	Unknown	kjaneway777@gmail.com	It would be AMAZING to have Indiana on all renewable energy! I would gladly pay more now to help move toward that end goal ????

9/2/21	Larry Flynn	Terre Haute	lflynn82@gmail.com	We all know the paradigm shift is coming, the only question left is if you're going to be part of the solution or continue this problem of burning coal and inducing a sick world?
9/2/21	mallory kincaid	Unknown	malpal543@gmail.com	I am a user of duke and I hope I won't be by the end of the decade if they haven't updated their power sources to something more sustainable
9/1/21	George Stevens	Salem	robcuts2u@gmail.com	Let's go green! Renewable energy for INDIANA
9/1/21	Emily Symon	Unknown	emily39miller@gmail.com	This is extremely destructive to our planet and to all life forms on it! We need to find other ways to generate and harness energy for all who need it, without causing so much death and destruction.
9/1/21	Melody Parish	Jeffersonville	melparish11@gmail.com	Indiana can do better with renewable energy! Let's be an example to the Midwest and lead the way with energy that works for citizens AND the environment. Climate change has been ignored by government and industry for far too long, and our window for changed is quickly closing!
9/1/21	Kristina Waters	Louisville	kwaters09@ymail.com	Jeffersonville would be a better place with more efficient fuel sources. With living next to a big city, it's the least we can do to protect our communities and eco system.
9/1/21	Justin Martinez	Unknown	justin.matthew2015@gmail.com	Earf is my home ??
8/31/21	Brandon Dussia	Unknown	brandon.dussia@gmail.com	We should be pursuing a coal free energy source by whatever means necessary. Indianapolis isn't the largest city but if we could find a way to move away from fossil fuels then maybe cities like Chicago, New York, L.A. could use what we've accomplished as a model for them to go more climate friendly. We already know we need to make the change, let's just do the thing already!

8/31/21	Lisa cardona	Unknown	lisacardona1497@gmail.com	It's time to fall in line, Duke. The era of unconscious action regarding the planet has passed.
8/31/21	Lynzy Finnegan	Unknown	lynzyfinnegan@gmail.com	My 6 year old daughter deserves a clean planet and home state for her future!
8/30/21	Nicholas Noonan	New Albany	nicknoonan420@gmail.com	Coal is bad, we can do good!
8/30/21	Ronny Chan	Huntington	ronnychan927@gmail.com	I still have roughly 80 years on this Earth, and I wouldn't want to leave behind a world worse than I came into.
8/30/21	Ehyona Miller	Unknown	ehyona.hugs.trees@gmail.com	Hoosiers deserve better, we should not have to fear for our future, or the impact this will have on our grandchildrens lives because we are lazy.
8/30/21	REBECCA MURRAY	Merom	rsmjjp@mac.com	Duke Energy is by far the worst polluter for energy generation in our state of Indiana. The climate crisis may yet destroy our planet. But I urge you to act immediately to reduce your carbon footprint ASAP! Our world depends on it.
8/30/21	Raven Renn	Unknown	ravenzrenn@gmail.com	It's so important for our children that we move our energy sources to sustainable practices that reduce and hopefully absorb CO2. It's up to consumer's to convince large corporations like Duke Energy to invest financial resources towards this necessary change.

8/30/21	Lance Brumfiel		lancebrumfiel@gmail.com	Doing nothing has become an act of malice. By continuing to use fossil fuels, any success is disreguarded by the failure to make capable and necessary transitions. It is failure for your business, for your employees, for your children and all future generations, and for the planet that is our home. Instead of being peaceful inhabitants we have become a deadly parasite. This is an opportunity to show what you can do. This could be a heroic moment for companies that have plagued us with congested, poluted air and war after endless war. Please. Do something.
8/30/21	Tawnee Ballard	Unknown	tawneerenee@gmail.com	I'd like to continue bettering the world for my son and future generations
8/30/21	DEBRA A GOODMAN	Bloomington	2debbiegoodman@gmail.com	move to a more environmentally friendly and sustainable practice!
8/30/21	Alexandra Mcmasters	Clinton	alexandramcmasters@gmail.com	I want a clean and healthy environment for my child to thrive in when she grows up, I want the world to remain beautiful and fruitful and crawling with nature's exotic creatures. Climate change wontbget better unless everyone does their part. Have a heart.
8/30/21	Ishmael Oliveras	Unknown	isnoliveras@gmail.com	For the simple facts that in july 2022 Duke energy doesn't have to pay credit back to solar energy homes. They just out priced most avg American from making the green choice on there own. It's time now to step up and do what we need done. Green energy if TEXANS can make more jobs and more energy so can we.
8/30/21	Jeffery Butwin	Unknown	jeffbutwin@gmail.com	For our children to have a world worth living in.

8/30/21	Kristen Fenton	Unknown	virtue2gosomk@gmail.com	I want a better planet for me (because it's already bad) and for my children and their future children. Renewable energy is a way forward.
8/30/21	Michael Lewis	Whitestown	michael.lewis140@outlook.com	No coal! Get with the times.
8/29/21	Bianca Harper	Bloomington	biancakimavila@gmail.com	We need to do what we know is right before it's too late! It's easy and possible to create and implement and new eco-friendly plan. Let's progress, Indiana!
8/29/21	Jerry Davis	Unknown	jwdavistrey@gmail.com	We need to start worrying about wildlife and quality of life because these are reasons for people to become and stay Hoosiers. Our lakes and Rivers are polluted to the point it would take hundreds of years for restoration. We have continuous air quality warnings through out the state which prohibits people with breathing issues to walk outside. That means our retired elders with breathing issues can't even enjoy the land they spent their whole lives saving for and/ or maintaining. It shouldn't be 2030 because by then it will be that much harder to reverse the adverse effects from the pollution. It should be closer to 2025. These corporations treat our local laws and regulations as guidelines and treat our fines as dumping fees. I wish to swim in the beautiful waters of our state without issues of potential chemicals. To breathe the beautiful air that our environment has provided for us without state residents worried about if they will be able to breathe or not.

8/29/21	Sarah Greenwell	Unknown	sarah.greenwell11@gmail.com	Sustainable energy is the way of the future. If you stick with coal, your business will not last. Commit to moving away from coal, and you can gain access to transitional programs that help your workers keep jobs, and energy with better outlooks for profit. Feel free to contact Sierra Club and local Green energy resources if you want to start working towards better outcomes for your company and for the planet.
8/29/21	heather howard	Unknown	howardheather173@gmail.com	Come on we already pay enough.
8/29/21	Betty Petrie	Unknown	bettyloufrederick@gmail.com	Climate change is real and effecting us all. Please make changes to be cleaner for us all!
8/29/21	George Tyler	Unknown	mitchell.tyler1021@gmail.com	The climate crisis is by far the greatest, mot urgent threat we have ever faced. To not take action immediately is a disgrace to humanity. Fossil fuels must be taken out of the equation immediately if we are to cut emissions and avoid climate catastrophe. Coal does not have a place in our future and Duke Energy needs to undsrstand this.
8/29/21	Bailey Hughes	Unknown	behughes08@gmail.com	We are all tired of a few companies running everything for the poor and working class. Help be one of the better companies so we don't have to complain about you. You know if you make the switch to better cleaner energy, Duke energy will be the talk of all progressives. If you don't want that kind of energy, stay the same and ruin our earth.
8/29/21	Amber Goodman	Unknown	info@alignedwithdesign.com	Please choose a more environmentally friendly and sustainable practice for the future of our planet and all the children of the world.

8/29/21	Raine Moon	Unknown	rainerusso@gmail.com	Please make a a future for our children possible with a conscious move away from coal. We currently are looking at a world changing because of coal's impact. Let's change innovate and make sure we have a planet left for generations after us to enjoy.
8/29/21	Martha Bunton	Anderson	7marthag@gmail.com	Indiana could be beautiful ecosystem and environment that wild life and citizens could benefit from.
8/29/21	Steven Van Elk	Unknown	srvanelk@gmail.com	Hey indiana, let's move into the future so we don't get left behind by the rest of the world
8/29/21	Sharon Dean	Greenwood	sharonadean@yahoo.com	I'm a customer and I want you to do your part to make Indiana a clean, livable state. I'm thinking of going solar.
8/29/21	Josh McKinzie	Unknown	bigmacjam@yahoo.com	I live here. My family lives here. We have for generations. The world around us has been changing, why arent you?
8/29/21	Aaron Crafton	Bloomington	aaronmcrafton812@gmail.com	2 days ago my brother who was 43 was buried. He died of Cancer. When does this stop. If we know we can help, let's do it. Please.
8/28/21	Merigold Carnahan	Unknown	merigold.carnahan@gmail.com	Big oil is the worst thing to happen to this planet. For the sake of the citizens and the planet itself, who are you to decide the fate of this whole world? Despicable.
8/28/21	Cherryl Friedman	Noblesville	jercher@hungrydawg.com	You are one of the biggest polluters. Move to clean energy now. I want my grandchildren to have clean air and water!
8/28/21	Jennifer Rockhold	North Vernon	jenniferrockhold@hotmail.com	I had no idea Indiana was such a big polluter! I will spread the word within my network of family and friends. Duke Energy needs to do much, much better and quit burning so much dirty coal.
8/28/21	Wanda Coil	New Castle	aladyfaed@gmail.com	They need torltake responsibility....

8/28/21	Cody Whitesell	Brazil	cwwhitesell@yahoo.com	You may have a monopoly power here, but that also means you bear the most responsibility for being good stewards of the environment to make renewable energy something that is in the NOW, not just something from an indeterminate future time that you aspire to.
8/28/21	Abby Emigh	Unknown	abbyemigh1@gmail.com	I don't want to have kids because I'm scared of what they will have to deal with in regard to the climate crisis. Please help keep our planet viable for generations to come by transitioning to renewable energy by 2030. Kindest regards, Abby
8/28/21	Ashley Phillips	Unknown	florianfamily1433@gmail.com	Enough is enough! Do away with coal!
8/28/21	Emily Knierim	Unknown	emrknierim@gmail.com	Duke Energy, you can do it!! I know change is difficult, scary and costly; but I know your team of capable board members, engineers, managers and workers are more than able to change! Please don't let money be a driving force in scaring you away from this positive change. BE THE CHANGE!!
8/28/21	Karen Randolph	Terre Haute	karen.a.randolph@gmail.com	I'm deeply concerned that coal ash pits are turning the state of Indiana into a future superfund site. In a changing climate with increasing natural disasters such as the recent 17 rain flooding in Tennessee, toxic pollution and waste from unlined coal ash pits are a disaster waiting to happen. We must find a renewable energy source for central and southern Indiana that won't pollute the groundwater.

8/28/21	Bristy Day	Unknown	bloomingkidsyoga@gmail.com	Please invest in and find another way, like the rest of the deveoplwd world. Thank you. We like to have a clean environment AND have electricity. There are no reasons we can't.
8/28/21	Elizabeth Heaney	West Lafayette	elizabethahrenheaney@gmail.com	If you CARE about future generations and our planet, you will ACT.
8/28/21	aurora dean	Unknown	aurorathestar03@gmail.com	I'm basically paying duke energy to pollute and that is not okay. and I live in Indiana. I want us to be safe
8/28/21	Lesley Rine	Fishers	lesleyrine@hotmail.com	It's time for Indiana to lead the Midwest in sustainability and be environmentally responsible
8/27/21	Ethan Smith	Unknown	ens10133@gmail.com	The more we time we waste the harder it's going to be to fix what we've done. If we can even fix it.
8/27/21	Cassidy Lucas	Unknown	cdlucas96@gmail.com	It's beyond time to move to renewable energy. We only have one planet, let's do better for it.
8/27/21	Elisabeth Naugle	Unknown	elisabethnaugle@gmail.com	id like to be able to breathe in ten years.
8/27/21	Kara Feider	Unknown	kara.clodfelter1@gmail.com	Greenland is already irreversible and melting more day by day. COME ON. help your GRANDKIDS have a future.
8/27/21	Olivia Ricchi	Unknown	livierich@gmail.com	Coal is running out. Even though we can't make anything 100% renewable (entropy), we could make the switch to something that won't run out and won't cause such extreme pollution.
8/27/21	Laura Sheehan	Indianapolis	laurasheehan1019@gmail.com	As the parent of a six year old daughter, I want to make sure that she has a healthy planet to live in in 30 years when she is my age. Please take swift action at Duke Energy to better care for our common home. Your decision will be a standing or falling point in the history of our planet.
8/27/21	Julia Lansberry	Unknown	jewelsandroses6@gmail.com	Let's start doing better!!!!

8/27/21	Mollie Plummer	Noblesville	mollie@mollieplummer.com	It is beyond time to leave the dark ages of fossil fuel. Why not become the leader in clean energy Duke?! This country could use a "good example" and an industry leader. Mollie Plummer, Noblesville, IN.
8/27/21	Kaleb Byers	Lafayette	byerskm2@gmail.com	My family lives in Florida and California and all over. Our coal consumption is going to hurt them before it hurts us here in Indiana but is still our duty to care.
8/27/21	Brooks Brown	Unknown	brooks549@hotmail.com	Yesterday is too late to start converting all energy production to renewable/nuclear energy. Please listen to the scientists and your heart and change the source of energy production.
8/27/21	Kimberlyl Goodson	Rushville	kl_goodso@yahoo.com	You need to do something to lower cost to your coustmores if this is it then you should do this
8/27/21	Avery Jordan	Unknown	averygoddamnjordan@icloud.com	Life and money is pointless if the climate won't survive another 20 years of pollution
8/27/21	Madison Devore	Unknown	devoremadison98@yahoo.com	We have one place to live. There are alternatives.
8/26/21	Shera Niece		sheradixon@yahoo.com	I want a safe healthy world for my children and my children's children.
8/26/21	Chyna Roberts	Clarksville	elizabethchyna99@gmail.com	Please do this for humanity. Please start advocating protecting this earth. We are not given another earth. We are hardly given another day to live. What if we have more lives? What happens if we damage our earth until it's without hope? We would never be able to live here again. The loss of humanity. We have to get moving ASAP. THERE IS NO MORE TIME LEFT.
8/26/21	Alexander Morton	Unknown	amorton6@sycamores.indstate.ed	I have hope we can finally get this state, which is in a bad state, to moving beyond coal and fossil fuels.

8/26/21	Laura Dragoin	Bloomington	laura.dragoin@gmail.com	Clean air is a clean, healthy life. Ditch coal, embrace wind and solar power!
8/26/21	Chelsea Reeves	Unknown	cmcr87@gmail.com	It is negligible to plan on continuing the use of coal when the evidence is clear about how it's pollution is effecting the people in this area.
8/26/21	ivie gilbert	Unknown	iviegilbert45@gmail.com	I don't want the world to end in 20 years please! It's already too late to make an impact but we have all the opportunities to do it. Stop being greedy Indiana. Coal is totally 1880s. Renewable energy for the win!!!
8/26/21	Sandra Cash	Unknown	sandra.cash@indwes.edu	Let's get 100% clean energy!
8/26/21	Jordan Meece		jmeece1759@gmail.com	Please work towards switching from coal and fossil fuels. I understand that we have been using them for decades, even centuries, but we are depleting our world, country, and beautiful state. What's going to happened to our home in fifthy, hundred, even two hundred years from now. If we keep depleting, there is not going to be any beauty, resources, or life left. I dont want to put my decendents through that. Would you want your children, grandchildren, or great-grandchildren forced to try and survive in a place like that? I want generations after me to be able to experience life and beauty of this lovely state, world, and country. That why I send this to you, because I would like to make some changes to help lessen the damage that is already done and try to replenish as much as we can. Thank you!
8/25/21	Mary Stoll	Evansville	stollml@yahoo.com	Don't be the reason the future is bleak for literally everyone. Please do the right thing and also on a separate note, stop living in the dark ages. The world is moving forward. Where the hell are you?

8/25/21	Gloria Vazquez	Unknown	kooks0713@gmail.com	We need to consider our lives important, our children's lives are important! No action taken means we don't care about the planet/ the life we have? Let's do it for our kids and for our families! We need to take ACTION NOW for the sake of humanity!
8/25/21	Amanda Meek	Shelbyville	ameek2015@gmail.com	The generation being born will not have a planet to live on if we don't don't make changes now. We owe it to them. Please consider saving our one and only planet before it's too late. Please.
8/25/21	Esther Slabach	Noblesville	eslabach@yahoo.com	We have to act now before it's too late.
8/25/21	Jared Leath	Unknown	the_nike_red_jared@aol.com	Being the third highest carbon producing state due to coal being used as electricity, I feel we need to take a step further and better all of society. Thinking about how earth will be for our future generations if nothing changes us a haunting feeling. Before it is too late, stop all this carbon emission and look for a better and brighter electricity source.

8/25/21	Natalie Hartman	New Albany	nhartman073@gmail.com	I am currently a chemical engineering major and chemistry minor at the University of Louisville, heading into my sophomore year, and I stand very strongly with the Sierra Club even though I am not an active member. I have loved their passion for the environment and sustainability; sustainability not only for the environment but economically and socially. I know you are working toward going green, but more implementations can be made! I understand the economic ramifications of such high goals, but there are more significant environmental ramifications if large companies don't do their part! Also, as an engineer, I know how difficult it can be to be 100% sustainable or environmentally friendly, but new technologies are in the works and will be available in the near future to speed up the process!
8/25/21	Danielle Flanders	Unknown	danielleburriell@gmail.com	This should have been a change years ago, at least to the right direction. The fact that y'all gave up and went back to coal, is disgusting.
8/25/21	Megan Fannin	Unknown	mdeck1988@gmail.com	I want my kids to live in a better future. The one I was promised, but missed. The planet needs help, or there's not going to be anywhere for my grandchildren to breath.
8/25/21	Alex Rittenhouse	Unknown	alrittenhous01@gmail.com	The time is NOW!
8/25/21	Jaren Woods	Unknown	swaggyj046@gmail.com	This state needs big change and renewable energy is one of the many.

8/25/21	Michael Mullett	Columbus	mullettgen@aol.com	Stan, it is critical that Duke act now to retire its Gibson, Edwardsport and Cayuga and replace them with clean, sustainable energy resources interconnected to the grid at both the transmission and distribution levels. The futures of our children and grandchildren and life as we have known it for all humanity depends on it.
8/25/21	destinie dearing	Princeton	tallsunflowers527@gmail.com	I deserve a better future. We all do. Fossil fuels aren't helping us.
8/25/21	Abner Miralda	Unknown	abner.e.miralda@gmail.com	Having moved to Indiana from Colorado, where wildfires burn hotter and faster than ever before, I have first hand seen the destruction symptomatic of climate change. The biggest steps towards mitigation aren't done by consumers recycling aluminum cans, it's done by companies and upstream manufacturing. I urge Duke Energy to move away from coal, which is a leading cause of greenhouse gasses. -Abner Miralda
8/25/21	Audra Dozier	Unknown	ottergems@gmail.com	I don't want my kids growing up and being left in the shables climate change will lead to
8/25/21	Owen Abel	Unknown	moldybutt15@gmail.com	Looking as we only have about eight years to do something about the climate or humans will be forever past tense. I?d really hope you people had enough common sense to just choose to go for clean energy but you opted for the opposite and chose money over your and everyone you?ll ever meets lives. I hope the check is worth it

8/25/21	Taylor Stapleton	Unknown	stapleton7717@gmail.com	My son and I suffwr from Bronchiolitis and I believe it is as a result of living indiana for myself over 2 decades and for him just 3 short years. They need to put a stop to this and fast. Exhaustint all our natural resources. What does the future look like for my son.
8/25/21	Nicole Skinner	Unknown	nicoleskinner9953@gmail.com	I live near many of the Duke Enegry power plants and I fear for my health overtime. Please cut back on carbon emissions. Be a good neighbor!
8/25/21	Zachery Abrams	Unknown	zachery9271@gmail.com	C'mon Duke energy. Don't be weenies and use coal. Real engineers find new ways to create energy.
8/25/21	Jonshae Thomas	Unknown	jonshaethomas123@gmail.com	Let do it
8/25/21	Ciera Eadler	Unknown	cmeadler@gmail.com	The earth is literally dying. Help fix it. I'm tired of this.
8/25/21	Gabrielle Soe	Unknown	gshafer18@gmail.com	I am an Indiana resident who believes that our communities need to take action now for the benefit of our environment, our state, and our world. Please consider moving towards using greener options for our state's energy consumption and away from coal.
8/25/21	Rachel Walcott	Unknown	walcott.rachel@yahoo.com	PLEASE save our earth!!
8/25/21	Camille Harris	Unknown	harrisck122@yahoo.com	I want a future for my children, and for everyone else. We need to be actively tackling climate change NOW or there won't be a world for you to monopolize.

8/25/21	Talisa Cobb		tcobb3221@yahoo.com	Fossil fuel pollution harms our environment and climate. Low-income communities and communities of color suffer disproportionate damage that is especially visible during this unprecedented time of global hardship. - Move beyond coal before 2030 - Eliminate fracked gas plants from your plans - Transition to 100% affordable, renewable energy before 2030
8/24/21	Amie McKibban	Evansville	armckibban@usi.edu	I beg you, help us breathe easier.
8/23/21	Clint Unger	Indianapolis	clint.unger@gmail.com	Please act now! There is now time left.
8/23/21	Elizabeth Porter	Indianapolis	e-porter1943@sbcglobal.net	Take care of the earth that the Lord made.
8/23/21	andrew vest	Evansville	sweater.vest0001@gmail.com	please consider the health of the community and the natural world in your decisions. I know profit margins are important, and wind/solar/hydro tend to out compete fossil fuels in the modern era. Our planet is important, the climate crisis has not even begun to rear its evil head. Consider future generations please.
8/23/21	Gary Webb	Greenwood	garytntwebb@aol.com	I have kids and am hoping to have grandkids. I don't want their world to be miserable. Please really move beyond coal instead of just talking about it!!
8/19/21	Courtney Nichols	Unknown	courtneypline@hotmail.com	The time to act is now. We need to invest in renewable energy before it's too late.

8/19/21	Marsha Webster	Zionsville	msw575@att.net	That our planet is endangered by rising temperatures, more violent storms, wildfires and rising sea levels is no longer debatable. Duke Energy must develop renewable sources of energy and eliminate fuel fossils immediately. Every day I worry about the future my children and grandchildren are facing. You have the a position of power and influence that enables you to help create positive outcomes for the planet. Please use the resources at your disposal wisely, effectively and QUICKLY! Thank you.
8/18/21	Benjamin Davis	Unknown	bendavis22@gmail.com	Solar and wind are now cheaper than fossil fuels. Not only is it the right thing to do for the climate, it is the right thing to do for your costs and your customers.
8/18/21	Eric Mannweiler	Indianapolis	ericmannweiler@gmail.com	We need clean, renewable energy in Indiana. Not gas. Definitely not wood chips. We need wind and solar. It's ridiculous that the cheapest energy source has to be sourced from out of state, when we could be generating it right here.
8/5/21	Nancy Tatum	Carmel	penguinet111@gmail.com	Climate crisis should be Duke's number one priority. No fracking. It is time to move to renewable energy now. Thank you
8/4/21	Linda Evinger	Evansville	levinger@usi.edu	I live here and I breathe the air!
8/3/21	Joshua Kikta	Cicero	joshkikta@gmail.com	Coal is harming our environment and our health. It is time for better solutions including homeowner owned rooftop solar. It's time to take care of your customers and not just your shareholders.

8/2/21	Melinda Deedrick	Noblesville	jmdeedrick@sbcglobal.net	The earth heating up and storms increasing in severity puts our lives, our food supply and the wellbeing of generations to come in dire straits. I beg you to please think of the world's children when you think of future. Please get rid of coal, fracking and turn to renewable energy.
8/2/21	Brooke Ferrell	Carmel	brferrell0316@aol.com	If you as a corporation end your use of coal and make the change to clean energy, you would have the single biggest impact on the environment, and therefore your customers? well- being, in the state of Indiana. No individual could do this. You can. Please make the change now.
8/1/21	Meredith Mccutcheon	Indianapolis	meredithemccutcheon@gmail.cor	As a new mother, I am very concerned about what the environment and climate will look like for my child's future.
8/1/21	Shelly Brown	Westfield	shellybrown160@msn.com	Please encourage legislators to overturn SB309 that ends net metering in Indiana. Distributed energy production should be part of the future! Homeowners, schools, and other entities can play a key role in providing energy for all of us!
8/1/21	Matthew Workman	Unknown	m.wrkman@gmail.com	Some things aren't popular or easy, but you still need to do them. Irrespective of the politics and downsides, you are Indiana's biggest lever in reducing carbon. You need to accept the responsibility of being a public utility and safegaurd the public that you serve.
7/31/21	Carl Lowry	Fishers	carlowry077@gmail.com	Global warming Climate change affects every human on the face of the earth - yes even you. Duke's goal should be to achieve zero carbon emissions by 2030 or sooner.

7/31/21	Linda Downer	Carmel	ld019283@hotmail.com	Duke needs to take steps now to reduce our carbon footprint. As individuals we can only do so much and that doesn't cut it when we are burning coal for our electricity. Duke is doing its patrons a disservice! Duke is burning up our environment! Develop a proper plan for the future and follow through.
7/31/21	ari goldman	Fishers	arigoldman16@gmail.com	what's not clicking?? you're ruining our planet and killing the environment with your dumb choices. why do y'all think it's a good idea to keep doing what you're doing even though you're destroying the earth. why does money always come first compared to real life issues that will impact our future. you're killing plant life (our source of oxygen), killing animals, and destroying the ozone layer. doing this stuff only makes our planet die. you're risking the human race just cause you wanna make money off of unnecessary pollution.
7/30/21	Sarah gillim	Westfield	sgillim@ccs.k12.in.us	Please be a leader and move away from fossil fuels as quickly as possible. The next generation is depending on you.
7/30/21	Marisa Bruce	Westfield	marisabruce521@gmail.com	I have little kids who love the outdoors, and I want them to have a world where they too can bring their kids outdoors!
7/30/21	Nancy Tatum	Carmel	penguinet111@gmail.com	Coal is so 1990's. Let's move forward with progress toward renewable energy. NO FRACKING ALLOWED!
7/30/21	Jean VanLeeuwen	Unknown	mjvan67@sbcglobal.net	Duke needs to make changes for all of us. Please work toward the goal of renewable energy!!!!!

7/30/21	Teresa Hultz	Indianapolis	teresahultz6@gmail.com	All the lives affected by our changing climates.....er.....that is every life. Here in Indiana we will get hotter, drying out crops fields along with stronger storms causing more natural disasters. Duke can help us avoid all this. Please help us. Put profit mongering aside and consider the millions of lifes (human and otherwise) you could affect for the better....not to mention future generations.
7/3/21	Kathleen Dirosaria	Lafayette	kadr0716@yahoo.com	Duke is still acting and planning future actions as though we were not confronted with the reality of climate changes in all forms : deadly, expensive and uncontrollable. We were warned, but didn't change fast enough. You, for instance, are planning to use gas from fracking.What's wrong with you? Is your job and future profits worth making our very near future Hell on Earth. Oklahoma didn't used to have earthquakes before fracking. What are you thinking??
6/27/21	Karen and Will Lozow Cle	Bloomington	woodelf3004@gmail.com	We demand and deserve a Green New Deal and to save our planet . We want rooftop solar ,wind turbines and to keep it in the ground . We have just one habitable planet -and we must save it now .
6/22/21	Lee Stewart	Cloverdale	susan.lee.stewart@gmail.com	Think solar or wind power, but certainly not coal with gas not far behind
6/18/21	John Sodrel	New Albany	jesodrel@yahoo.com	Climate change is the biggest threat humanity has ever faced. Duke should be a leader on this front--not only because it's good for business but because it's the right thing to do--rather than the laggard it currently is.

6/17/21	Duane Reeve	Fort Wayne	drev96@gmail.com	Mr. Pinegar, Do you not have a family? What kind of future are you leaving them. Wealth cannot by clean air, security from devastating changes in weather patterns, continued increases costs to disaster relief by the federal government. Fossils fuels are a finite energy. Stop milking the profits for a limited long term strategy and develop a robust strategy
6/17/21	Anthony Helms	Unknown	anthonyhelms05@gmail.com	You know the damage you're doing. You know the consequences. Just move your investments into clean energy, it's not a hard decision and you know you will have to switch eventually. Be one of the companies to set a new standard, not one of the companies who fall behind.
6/17/21	Julia Spangler	Indianapolis	spanglerjl@gmail.com	Renewable energy is the future. Be a leader and move away from fossil fuels before 2030!
6/17/21	John Smillie	Crawfordsville	john.thomas.smillie@gmail.com	I'm deeply worried about the effects of climate change, toxic coal ash, and particulate pollution on human health, agricultural productivity, and ecosystems. Burning fossil fuels is the primary cause of all these, and we must stop burning them as soon as possible. We must urgently scale up wind, solar, storage, and transmission, and develop other clean, firm generation solutions.
6/16/21	Carl Lowry	Fishers	carlowry077@gmail.com	Mr Pinegar, I studied global warming and climate change from 2002 to 2008. I came away from those studies convinced that we must stop using fossil fuels, mainly coal, if we are to survive into the next century. The science is there we just need the right policies to implement it.

6/16/21	Louanna Fowler	Lawrence	fowlerlouanna@gmail.com	It's time for change keep up with is better for our future...step up Be a Leader to our future
6/15/21	Jenni Beesley	Unknown	jenni@findtrails.com	Please please do what you can to protect the future for everyone and everything on our planet. You are in a position to do way more than the average person. Please use this power for the good of all. ?
6/14/21	BEVERLY OHNECK-HOLLY	Bloomington	bohbltn@gmail.com	To Stan Pinegar: Duke Energy has shown through past projects that it fails in planning, delivery, safety and financial constraint. WE THE PEOPLE DO NOT WANT NOR NEED ANY MORE DUKE PROJECTS. NO FRACKED GAS PLANTS. NONE. WE WANT AFFORDABLE, RENEWABLE ENERGY. NOW. Duke, as you are is a dinosaur, an out of control, failed planner, manager, self-controlling business, utility, Corp, GET OUT DUKE ENERGY. HELLO SUNSHINE!!!
6/14/21	Thomas Bodnar	Unknown	tbodnar23@gmail.com	It is beyond time we join the rest of the country in eliminating coal and transitioning to clean, renewable power. My family members with asthma can't wait. Our climate can't wait. The world can't wait.
6/14/21	Teresa Hultz	Indianapolis	teresahultz6@gmail.com	Renewable energy 100% asap

6/13/21	Gloria Morelock	Elkhart	glomore5573@gmail.com	Move beyond coal before 2030 - Eliminate fracked gas plants from your plans - Transition to 100% affordable, renewable energy before 2030 Fossil fuel pollution harms our environment and climate. Low-income communities and communities of color suffer disproportionate damage that is especially visible during this unprecedented time of global hardship. Utilities across the state and country are moving quickly to provide customers with inexpensive, clean, renewable energy, while protecting impacted communities and workers in the process.
6/12/21	Mackenzie Hughes	Whiteland	ms.noelle1995@gmail.com	This planet is not ours to destroy. Get onboard with cleaner energy. I want my children and grandchildren to be able to breathe without oxygenators.
6/12/21	Spencer Schwartzbach	Fishers	sschwartzbach@yahoo.com	Stop using coal, our future depends on it!
6/11/21	Sue Render	Lafayette	suerender@comcast.net	I have been a customer for years. I am always receiving info that you are taking the climate crises seriously but I don't see that put into practice. Please act now.
6/11/21	Laura Maryi	Brownsburg	lmatyi1@live.com	Why does Indiana always have to be at the top of the list of states of super polluters? There are so many better energy options now. Duke get on board with clean energy.
6/11/21	Michael Boland		bolandmikej@gmail.com	As solar and wind becoming cheaper than coal or natural gas, it becomes crucial for DUKE energy to get with it and move to alternative green energy or be left behind by other utilities or by rooftop solar as more houses, churches, businesses, and government office building go solar!!!

6/10/21	C Scott Pazera	Lafayette	scottpazera@yahoo.com	Please start planning for a future for your children.
6/10/21	Philip Emmi	Bloomington	philemmi@mac.com	Your intention to move slowly toward renewable energy and remain committed to fossil fuels is a formula for increased this investment. To guard against this, follow industry trends toward accelerated adoption of renewable energy.
6/10/21	Myra Craig	New Albany	mcraig2050@gmail.com	Clean energy now!! It's time!
6/8/21	Marilyn Bauchat	Bloomington	marilynbauchat@gmail.com	Your customers deserve clean air and water.
6/7/21	Judith Ganser	Indianapolis	jaganser@sbcglobal.net	As a pediatrician I am very concerned about air quality.
6/7/21	Lytitia Shea	Rochester	lytitia@comcast.net	Need to get with the program. Invest in renewables and save money and lives. L Shea MD
6/6/21	Ben Holly	Bloomington	bohbltn@gmail.com	Absolutely NO FRACKED GAS PLANTS . IN INDIANA ONLY SAFE, CHEAPER, RENEWAL ENERGY SOURCES::SOLAR, WIND, WATER.
6/6/21	Paula Gilliatt	New Albany	pgilliatt2001@gmail.com	We have used most of our natural resources and need to find alternative resources. Maybe not for but for our children and grandchildren.
6/6/21	Brandon Melanson	Lafayette	branmelanson@gmail.com	With our state lagging behind on innovation in favor of what works already, its beyond time that Indiana doubles down on its renewable energy efforts. New jobs could be created for men and women attempting to modernize our renewable resources and could make Duke a national frontrunner for energy innovation. Fracking has deadly consequences long term, and land poisoning consequences short term, which makes simple infrastructure like wind farms and solar farms much more attractive from a global and local standpoint.

6/5/21	Steven Silva	Palmyra	stevensilva40@yahoo.com	Words will always be cheap. If you are serious about your environmental commitment, then you must take bolder actions to mandate less carbon emissions and a stronger emphasis on green energy projects that will produce more permanent manufacturing and maintenance jobs for American workers in the long term.
6/5/21	Nicole Smith	Bloomington	cubfaithful@gmail.com	Please stand by your word of working towards moving past a reliance on fossil fuels. Prove Duke is a company we can trust and believe in.
6/5/21	Greg Mitchell	Bloomington	grmitch2@gmail.com	For the sake of our children and future generations it is incumbent on us all to be responsible stewards of the environment and the best, most sensible course going forward is to abstain from fossil fuels, coal mining and fracking and instead commit ourselves to the development of renewable resources. Scientific consensus is overwhelmingly in support of this to protect our planet from global climate change.
6/4/21	Lyman Benner	Franklin	lyman462@yahoo.com	The sooner you go green the sooner we can all breathe better.
6/4/21	Larry Sellers	Lafayette	jimihendrixgod4604@sbcglobal.ne	It is time to look towards the future.

6/4/21	Dennis Carr	Indianapolis	carr550@gmail.com	The facts are in and they're clear: the negative impacts of fracking and fracking plants on health, the environment and climate change are just too high when cleaner alternatives with good paying jobs exist. Duke should be a better corporate neighbor, be part of the solution and less of the problem. Indiana's reputation for selling out the health of its people for corporate profiteers and Indiana's ranking as one of the most polluted and polluting states, and it's pro business pro pollution state legislature continues to embarrass and hurt it's people!
6/4/21	Tracy Hudson	Lafayette	pufootballfans@aol.com	It's time to be more environmental minded in everything we do.
6/3/21	Zach A	Columbus	zaqcq@yahoo.com	Clean renewable energy is what will put Indiana ahead.
6/3/21	Melissa Reynolds	Fishers	melreyno@yahoo.com	I'm ashamed of this state. It's absolutely disgusting how greedy people are. Ready to move.
6/3/21	Marilyn Bauchat	Bloomington	marilynbauchat@gmail.com	Please only use clean energy. Coal is not CLEAN.
6/3/21	Ian Shamley	Noblesville	ianshamley32@gmail.com	If we can get the green energy impacted into our lives sooner, we will be far more privileged in the future. The young will be educated by an earlier age age the amount of jobs will sky rocket.
6/3/21	Mary Eddy	Lafayette	maryebergeddy@gmail.com	We have this one planet. I'm one person doing what I can to help make it last. You are a giant company that needs to do what you can. Please start making BIG changes Now!
6/3/21	Randy Carle	Terre Haute	rc24sdtrt3@gmail.com	It is time to stop taking from the planet. It is the only one we have.

6/3/21	Margaret Furniss	Westfield	peggy.furniss@gmail.com	Continue your focus on solar and wind energy across Indiana. It's a great investment in our state!
6/3/21	Robert Castillo	Kokomo	rcasti11111@gmail.com	I've seen how fracking can adversely affected people. Why would you disregard the safety of your own constituents. This is crazy. STOP the madness! SAVE OUR PLANET! Our kids need it!
6/3/21	Katy Wills	Indianapolis	kathryn-wills@att.net	It's time to focus on renewable. Duke needs to invest in wind and solar, coal is the past, let's look to the future
6/3/21	Judi Jessup	Unknown	ms.judi.j@gmail.com	There are so many downsides to both coal and fracking, and there are so many upsides to clean energy sources. Clean energy offers a reliable energy source to providers, great jobs for workers, and financial & health benefits to consumers. It's truly a win-win-win situation! Please do NOT use dirty energy when we're facing a global emergency! My family has breathing problems that are worsened by air pollution, so this is very personal. Thank you for listening and I hope you will take positive action.
6/3/21	Ann Hemdahl-Owen	Otisco	annhemdahlowen@gmail.com	The environment is so essential and Duke needs to be on the forefront of leading the way to a cleaner environment.
6/3/21	Ann Hemdahl-Owen	Otisco	annhemdahlowen@gmail.com	Climate change is a huge problem. Duke needs to be in the forefront of supporting change.

6/3/21	Patricia Brown	Westfield	pjbrown3297@gmail.com	We had a coal furnace when I was a kid and it was terribly dirty in our basement, the smoke was black and nasty and then there were the ashes to take care of. How about some nice clean methane digesters producing a clean burning source of energy. We had one on our farm in Michigan. Takes care of the bacteria in the manure, eliminates the smell and produces a nice dirt. Solar panels? Wind generators Lots of good sources of energy and more energy could be produced locally. .
6/3/21	Janice Gigli	Gosport	robnj@bluemarble.net	As one of your long time customers, I'm shocked to learn Duke wants to invest in fracking plants. I'm against fracking and hope Duke changes its plans.
6/2/21	Heather Lawson	Kokomo	hmarie2397@gmail.com	PLEASE consider a better way, a path with less of an environmental footprint. We, as a whole, need to be thinking of future generations and what we are leaving behind for our children, grand children, great grand children and their loved ones. Our Earth is precious. We need to think of the wildlife impacted by climate change and global warming. Join these other companies in creating a path to a better healthier planet for future generations! There's no reason not to. Thank you kindly for your time.
6/2/21	Janice Sinn	Bloomington	jems1949@gmail.com	PLEASE USE CLEAN ENERGY APPROACHES! No more coal. No more disturbing the earth. PLEASE!

6/2/21	Franklin Drumwright	Indianapolis	frdrumwright57@gmail.com	Fracking allows undisclosed liquids to be pumped into the ground, with the potential of contamination of nearby aquifers. We do not need natural gas to live. We do need water! No Fracking in Indians!
6/2/21	Susan Shanklin	Columbus	skshanklin@sbcglobal.net	Please put our precious environment first!
6/2/21	L Tatum	Bloomington	ljtatum3@gmail.com	After the US suffered over 150 smaller earthquakes the past weekend, and scientists have proven fracking is responsible for more instability underground leading to more earthquakes, it is time to stop this and move to alternative energy resources. Renewable energy sources like solar and wind perhaps.
6/2/21	Annette Davis	Indianapolis	annette.davis317@gmsil.com	Stop Fracking!! We need clean energy!!
6/2/21	Penny Weissgerber	Camby	penny.weissgerber@gmail.com	We need clean energy. Please move in that direction for the good of everyone.
6/2/21	Beth Garfinkel	Unknown	beth.garfinkel@gmail.com	That's my state they're proposing to f*ck up with fracking.
6/2/21	Annamarie Williams	Lanesville	annamariemcphillips@yahoo.com	Please, for our children, grandchildren and our beautiful planet move to renewable energy sources!
6/2/21	Birja Short	Rochester	birja@yahoo.com	Please reconsider and switch to developing earth friendly energy like solar, wind and wave. Fracking destroys water aquifers.
6/2/21	Crystal Blinchikoff	Mooresville	crystal.lyn@live.com	Please stop killing the planet. Harness the sun. Do what is right. You have the power to effect real change. Please don't waste it.
6/2/21	Jennifer Koranda-Niesse	Fishers	jakniesse@gmail.com	I am begging you to move to clean renewable energy. My son and so many other children have asthma and what is put into our air impacts keeps them from living a healthy full life.

6/2/21	Jane Stangel	Greenfield	imaawzmom@yahoo.com	Please transition to renewable energy sources and eliminate coal and fracking from current and future energy plans.
6/2/21	Priscilla Campbell	Bloomington	pidye@hotmail.com	I don't understand how you can have no thought of the next generation. I w
6/2/21	Michael Naylor	W Lafayette	mikejanen@aol.com	Please consider our children and grandchildren and the future they will face if you and others refuse to act now to reduce harmful emissions.
6/2/21	Valerie Gerholdt	Indianapolis	valeriegerholdt@yahoo.com	All that wants this motion, ask for the fracking to be done on your land.
6/2/21	Shirley O'Connell	Indianapolis	shirleyoconnell@hotmail.com	We have 2 grandchildren in Indiana and moved to Indianapolis to be close to them. We want clean air for them and an Earth with a livable climate. Fracked gas and coal fired power plants are bad choices. Go for renewable power. Encourage solar and wind energy in every way possible. Focus on conservation because the cleanest energy is that which is never consumed. Promote a smart energy grid across the country.
6/2/21	Lynn Cook	West Lafayette	edlynncook@att.net	No fracking in Indiana!!!!!
6/2/21	Rachel Cowgill	Indianapolis	moofishdesign@gmail.com	Come on Duke Energy and come on Indiana. We need some decisive steps towards clean energy and this isn't it.
6/2/21	Ned Delaney	Lafayette	ned.delaney@gmail.com	Why must we continue the same kind of confrontation?
6/2/21	Jaclyn Smith	Carmel	smithjaclyn@hotmail.com	I am a customer and am concerned that I'm paying more and more for energy that is not renewable. Not only is it not renewable, but you seem to be finding even dirtier ways to supply our energy. Please get with the times and move to renewable energy that will give our children as much opportunity to enjoy the planet as much as we have.

6/2/21	Peggy Ventura	Indianapolis	peggyjventura@live.com	We must consider the future and make the switch to clean renewable energy.
6/2/21	Hugh Baker	Indianapolis	hugh@bakerlawteam.com	Dear Mr. Pinegar and Board, As we wander Indiana, do we not notice the many windmills and solar panels, and feel the innovative Hoosier spirit so alive once again? Hey big brother Duke, be a national leader, show your guts and grit, and plan great, enduring and sustainable energy for us, our children, grandchildren and beyond! Fracking is unnecessary, and will result in further destruction to the beautiful land of the Indians, our beloved and sacred Indiana home! Peace, Hugh Baker????????????????????
6/2/21	Jennifer Lott	Indianapolis	lottdance@gmail.com	Please consider the long-term, irreversible and negative environmental impact of fracking. For our children and our future, there simply is no scenario where it is worth any possible short-term gains. Conversely, the long-term positive impact of investing in clean energy could be exponential on many fronts. You can make a big, important shift here and lead the way for others. I pray you have the wisdom, creativity and vision to see it and to convince others. We are well-past the time to move away from coal.
6/2/21	Kris Chapleau	Indianapolis	chapleau@iupui.edu	Wharever few dollars you plan on making from fracking, our planet is worth infinitely more. What good is a yacht if it sails on a dead ocean?
6/2/21	Jill Evans	West Lafayette	bmds.nlci@gmail.com	We all need & use energy. But! Now is the time to repair damage already done to climate. For the love of lives to come after us please, please eliminate fracked gas from your plans, move beyond coal and toward 100% renewable energy before 2030.

6/2/21	William James	Terre Haute	wejames253@gmail.com	It's much too late in world history to be continuing the outdated fossil fuel model of the last centuries. If we are to survive as a habitable planet, we must change our thinking NOW. Please, seriously consider the future of Earth over sheer monetary gain.
6/2/21	Robert Simon	Milton	andreaspadre@yahoo.com	Dear Mr Pinegar, I know you are not going to pay any attention to what the right thing to do is. I know you will tell your children and grand children some excuse for not doing the right thing. Some b.s. about jobs and family I suppose. But picture those children in a future time struggling to survive and uninhabitable planet. They will suffer and die because of you and your greed.
6/2/21	Kirsten Sprecher	New Albany	jkigms@gmail.com	Be a leader in our clean energy future!
6/2/21	William Halsema	Indianapolis	wmchalsema@gmail.com	Good Day! I understand the need for inexpensive energy. But I also grew up in northwest Indiana with billowing clouds of pollution from the steel mills. I'm very afraid that fracking will have a similar effect on the water supply in the areas surrounding it. Southern Indiana is very beautiful - a treasure of/for our state. There are many opportunities for wind and water powered projects in those areas. Please reconsider what fracking does and accomplishes!
6/2/21	Sandra Matlock	Bloomington	hoss923@comcast.net	We NEED a BeTTer plan. Reusable, clean energy!!!!! A little respect goes along way. No frakking!

6/2/21	Autumn Schulze	Fishers	amschulze0@hotmail.com	Investments in clean energy now will pave the way for Duke's success for decades to come. The need for clean energy is inevitable and those who adapt early will be well positioned to lead the industry later. Plus, this is the right thing to do - for our kids and grandkids. Please, use your position of power to leave a positive legacy! Thank you for your time!
6/2/21	Gabe Granger	Indianapolis	ggranger@gmail.com	I strongly oppose fracking. It is unsafe and should not be done in Indiana!
6/2/21	Rita Sinsko	Fishers	rsinsko@gmail.com	Please try to think forward about what this means for future generations. We need more sustainable practices and you can build your industry on. An investment now in technology will be more profitable long term.
6/2/21	Stacy Gano	Bloomington	pandorawyldemagi@yahoo.com	Fracking is just as much a hazard to the environment as what you are doing now! This is not sustainable! Find something else that is renewable and affordable.
6/2/21	Steve Davidson	Carmel	maxey319@yahoo.com	I absolutely do not want fracking in Indiana! Surely you executives know the health risks to residents near the site
6/2/21	Nancy Abbott	Greenwood	nancyandleeabbott@gmail.com	It's high time Duke that you move beyond coal.. Do NOT do fraking!!
6/2/21	Mary Connors	Bloomington	aconnors@epix.net	Clean air and water is the foundation of a healthy and good life! Do not destroy the earth!!!!!

6/2/21	Melissa Bryant	Mooresville	mjbryant0624@gmail.com	Duke Energy, you're a major player in energy, so lead by example. Think of the legacy you can create and the world you will leave behind for the next generation, our children and our future grandchildren. Let the norm become clean energy, bring profitable while still making a positive impact. Be better than those who say we have always done things this way. Your company will continue to have loyal investors, and will even increase in the number of loyal investors when you make a stand and make a change. I use 100% green energy for my electric and wish I had the same option for my gas. There are those who will choose to do the same as the option is given to them.
6/2/21	William Turner	Indianapolis	wmmt81@gmail.com	While it is good that you have reduced your various emissions since 2005, what are your concrete plans for TRANSFORMATIONAL change?
6/2/21	James Rosensteele	Carmel	jim_rosensteele@me.com	We are running out of time to protect our children and grandchildren from the most serious consequences of climate change.
6/2/21	Mark Jungemann	Carmel	markjungemann@gmail.com	I'm a Duke Energy customer and owner of a private nature preserve. Your rapid and decisive action towards moving to renewable fuels will serve as an example to others. Thank you for being a leader in this fight for our children's future. Mark
6/2/21	Lisa Meek	Noblesville	meekwarren@gmail.com	This matters not only for our current generation but, more importantly, for our children and their children. We need to protect our planet and you, Duke Energy, are dragging your feet!
6/2/21	Ann Trierweiler		ann.t4@aol.com	Please share. Bad news.

6/2/21	Carl Lowry	Fishers	carlowry077@gmail.com	If you care about your family and friends you will do everything in your power to move Duke Energy away from reliance on coal and natural gas to renewable energy sources, e.g. solar, wind, geothermal, hydrogen, etc.
6/2/21	Paul Adams	Mooresville	padams4305@hotmail.com	Go green now can't wait
6/1/21	Alexander Shay	Unknown	ashay36@comcast.net	NO fracking!!
6/1/21	Diane Leuck	Lafayette	wackyad@aol.com	Indiana does not want fracking. Save our state
6/1/21	Ann Trierweiler		ann.t4@aol.com	Stop this assault.
6/1/21	Barbara Howard	Indianapolis	barbarahoward49@aol.com	Stop insisting on replacing one dirty fuel with another. Get busy on CLEAN power generation!
6/1/21	Mary Tanner	Fishers	mcctanner@sbcglobal.net	No fracking plants in Indiana!
6/1/21	Jennifer Cook	Unknown	ravenwraith@gmail.com	Seriously? Who did this anymore? Don't you have kids or grandkids you want to have a nice planet to live on?
6/1/21	Debra Guy	Loogootee	momguy53@yahoo.com	Try renewable energy, instead of ignoring it as a viable alternative.
6/1/21	Michelle Roberts	New Palestine	m.michelle.roberts@comcast.net	I am absolutely against COAL & FRACKING IN MY STATE OF INDIANA!! There are NEWER & BETTER WAYS! Please use them for our planet's future & our Grandchildren's future!!
6/1/21	Catherine Sacilowski	Nashville	catsacilowski@yahoo.com	Times are changing. Let's change to renewable energy!!
6/1/21	Kristina Hulvershorn	Indianapolis	kristinahulvershorn@gmail.com	Please choose to prioritize your future generations and the planet.
6/1/21	Steven Mcclatchey	Lafayette	smcclatchey007@gmail.com	It's time to move away from fossil fuels - put your investments in wind and solar instead of fracked natural gas. It will help all of us and advance these technologies.
6/1/21	Eugene Odonnell	Fishers	odonnellem@sbcglobal.net	Solar is less expensive and more reliable than gas. As a rate payer, I already pay for green power. Why is Duke making such an unwise investment?
6/1/21	Jeffrey Yegerlehner	Carmel	jyegerlehner@indy.rr.com	Clean up your act, Duke Energy!

6/1/21	Katie Rogers	Indianapolis	khrifd16@yahoo.com	Please- clean energy Do you care about your children's future? No more fracking!!!
6/1/21	Chris Foster	Jeffersonville	cfoster82@gmail.com	Please move toward renewable energy sources.
6/1/21	Deb Karabin	Indianapolis	maiael@hotmail.com	It's time to move out of the coal and horse and buggy days to a cleaner future! Get off your butts and do it!!
6/1/21	Mary Nolan	Indianapolis	mfnolan1@yahoo.com	Let's move away from dangerous fossil fuels, including fracking. Think more creatively! Change the narrative!
6/1/21	Annette Marino	Indianapolis	annettemarino@gmail.com	No fracking! Hoosiers do NOT support fracking! Wind and solar are where it's at. Please protect Indiana's future.
6/1/21	Lara Weaver	Bloomington	llweave@gmail.com	We all know that coal is not our future. Please act with consideration for future generations.
6/1/21	Rebecca Bradshaw	Indianapolis	rebeccbshaw@gmail.com	I thought fracking was unnecessary and outdated, today. I am very surprised that Duke is not moving ahead with technology and interest in protecting the environment and addressing the climate crisis with renewable, more affordable energy.
6/1/21	Jerry Moyes	Clarksville	eagle_bear@outlook.com	Fuels derived from fracking are the worst possible choice, doing irrevocable damage to the soil, water, and all life dependant upon it. Although I believe in going green, I also understand going green is a process that takes time. Fracking has no place in Indiana.
6/1/21	Michelle Littell	Indianapolis	lola_2525@yahoo.com	FRACKING?! In your back yard? Or, mine?

6/1/21	Toni Layne	Indianapolis	tlclayne71@yahoo.com	People are tired of the continued greed and disregard of all life by corporation's. The damage to all by the fossil fuel industry is disgusting. You have made a promise to all to go to nonfossil renewable energy sources, you need to put your avarice aside and make the right choices. People are beginning to realize what needs to be done to have a future clean world, and not changing now will only cost you more money in the long run.
6/1/21	Karen Dunivan	Indianapolis	tumbleweed962000@yahoo.com	I am a lifelong Indiana resident. It is time for Indiana and those doing business in Indiana to join the 21st century and switch to clean renewable energy. No fracked gas in Indiana!
6/1/21	Tom Probasco	Indianapolis	tlprobasco@gmail.com	We have no time to spare in stopping use of fossil fuels, if indeed we haven't run out of time already.
6/1/21	Sue King	Columbus	esue@comcast.net	Stop
6/1/21	Carol Fischer	Bloomington	cafische@indiana.edu	We need to aim the Other direction; clean the environment, save the planet.
6/1/21	Charles Gray	Lafayette	steve1948@aol.com	Why would we want to pollute the air to obtain a momentary flame.
6/1/21	Heather McAninch	Kokomo	hmcaninchppe@gmail.com	No fracking! EVER!!!! Think beyond your bonuses and profits. We need to be good stewards of OUR EARTH!!!!
6/1/21	Amy Peterson	Indianapolis	katokat@indy.rr.com	The most important action we can take for the our children's future is to take care of our planet! Eliminate fracked gas plants and replace with renewables!!!
6/1/21	Judie Lahr	Columbus	judielahr@comcast.net	Please transition to 100% affordable/renewable energy before 2030. Fossil fuels are enemy of our environment. Think beyond stuffing your bank accounts

6/1/21	Michael F Whisler	Indianapolis	snowlionind2@comcast.net	Trying to pretend that we don't need clean energy is pathetic. Trying to convince people that we do need pollution is even worse. The people of Indiana may not be as stupid as you hope. We demand clean energy now and in the future. Maybe you can figure out how to make millions with it. Try.
6/1/21	Randy Arnold	Bloomington	r.arnold@alumni.iu.edu	I have invested in solar on my rooftop, but we can solve the climate crisis until utilities are on board.
6/1/21	Eileen Hamidi	Madison	appleeileen@me.com	Everyone knows how bad fracking is and regions have moved away from it! C'mon Duke, get current!
6/1/21	Melissa Rose	Columbus	noahpbattin@hotmail.com	We have the technology to produce renewable clean energy and not damaging environmentally destructive unwanted means to produce power. The Earth has had enough. Please choose clean renewable energy production.
6/1/21	Ann Kelley	Indianapolis	akelley501@gmail.com	Coal is antiquated and so dirty and pollution causing!
6/1/21	Lisa Shahar	Terre Haute	pugsndane@yahoo.com	Stop this insanity!!
6/1/21	Julia Ritchhart	Indianapolis	jtdonohue@sbcglobal.net	Please acknowledge the reality of fracking and abandon it. It does more harm than good.
6/1/21	Bob Brault	Indianapolis	braultrl@hotmail.com	Leave it in the gorind!
6/1/21	Joe Wootan	Bloomington	jrwjr1@hotmail.com	Indiana deserves to have clean air and a chance at a better healthy life.
6/1/21	Suzanne Simnick	Bloomington	suzsimnick44@gmail.com	CLEAN. ENERGY. NOW.
6/1/21	Delbert Karr	Indianapolis	dktony12@gmail.com	Not good

6/1/21	Monty Wilson	Indianapolis	monsterwilson@gmail.com	Stop relying on fossil fuels! Be a leader in the industry and start using renewable resources! Save our water, save our air and start offering jobs that will last, not a gimmick for the short term. Let's do better for our future generations. Monty Wilson
6/1/21	Aaron Travers	Bloomington	aatravers@gmail.com	Fracking caused irreparable damage to the environment, and in a state rated as the 2nd most polluted state in the country, that is not a viable option. As a resident of Indiana I insist that you abandon this harmful plan.
6/1/21	Tonya Lamer	Indianapolis	tonyabulldog67@hotmail.com	Please help our environment. Is it more important to make money while destroying our planet, hurting animals and low income people? Put green first and greed out.
6/1/21	Susan Ekwealor	Richmond	sekwealor@aol.com	I urge you to use renewable energy instead of energy produced by fracking. We need to protect the environment.
6/1/21	Marsha Marcum	Brazil	marshamarcum13@yahoo.com	Fracking changes the environment in that area. Bad for plants and animals.
6/1/21	Darcy Staser	Indianapolis	dstaser.ds@gmail.com	I call one you to stand by your claimed commitment to move to cleaner energy. Using fracking sources energy is the opposite of that.
6/1/21	Ethel Eitel	Indianapolis	eitelnurse@gmail.com	Please look into alterative energy sources!
6/1/21	Andrea Rademacher	Lafayette	toymom303@gmail.com	Fracking is a ridiculous investment at this point. Be responsible and invest in green solutions that insure a safe future for Indiana.
6/1/21	Joshua Mott	Indianapolis	jamott50@gmail.com	It would be much more worth your time and money to invest in sustainable, cleaner energy rather than fracking. Please don't build these fracking plants and threaten our water supply and decrease our air quality even more.

6/1/21	Diane Carman	Russiaville	ddcarman1@aol.com	I can't believe you are planning to open fracking plants in Indiana. Please consider renewable energy sources.
6/1/21	Karen Irvine	West Lafayette	karenairvine@aol.com	Stupid! Fracking causes illusion and earthquakes!
6/1/21	Joe Betz	Bloomington	joe.betz.ii@gmail.com	Please invest in renewable energy.
6/1/21	Marci Daugherty	Carmel	marci.lynn@live.com	Let's not let Indiana be last in the fight to help make a difference towards reversing climate change. Let's improve the health amd finances of Indiana residents by making Duke be a better advocate!
6/1/21	Morganne Aaberg	Bloomington	moaaberg@gmail.com	Fossil fuel contributes to human pollution that is destroying the planet. God may have created the world, but he entrusted humanity as caretakers. Please help take care of the land for our children and future generations. Focus on solar and wind. Believe it or not, some people in this state actually care.
6/1/21	Linda Mothershed	Bloomington	twinmom94@gmail.com	What are we leaving our children? Please reconsider.
6/1/21	Felicia Lattimore	Whiteland	peacetousa@aol.com	Please make this world a better place instead of polluting the environment even more than it already has been and ruining natural habitats of creatures who have just as much of a right to thrive as humans do.
6/1/21	Janet Boze	Indianapolis	chloesmom1.jb@gmail.com	It's time to take action on your "claims" of being good stewards and helping the planet. "All talk and no action makes Duke a dull boy". Consumers are Tired of corporate BS, we see through the smoke and mirrors. STOP Using and Producing Fossil Fuels NOW! Nix your audacious plans for fracking too!
6/1/21	Cherlyn Reynolds	Bloomington	cherlyn5132@att.net	Get out of Indiana, ya bastids!
6/1/21	Mickey Penrod	Lafayette	cmpenrod@frontiernet.net	No to any fracking!!!

6/1/21	Marytheresa Mazzuca	Indianapolis	mtamazz@att.net	The use of fossil fuels in Indiana and the entire nation and world needs to stop now. The reassignment to sustainable energy sources has to stop now. Start doing it. Don't keep putting it off. Indiana and the world are experiencing destruction of positive climate existence. Perhaps your company executives feel that "It won't matter to me and I'll be gone" so let's just stay in the past. But your decedents will be very lucky if there is, in fact, any world with which to live. Everyone on this planet is getting sick from burning fossil fuels. Why would you not care about our state? The air will become thick. There will be severe acid rain, vegetation will be poisoned, wildlife will vanish, children will need to wear masks all the time and there won't be any clean water. Duke should do the right thing to protect us from these damages due to fossil fuels. There are sustainable methods to provide energy and protect our environment.
6/1/21	Susan Hejlik	Aurora	sushejlik@aol.com	I live in an area where coal ash cleanup is a big issue that is hurting development. We need GREEN energy, not coal!
6/1/21	Laura Rinderknecht	Indianapolis	laura.rinderknecht@gmail.com	Remove fracked gas plants from all of your plans! This is not the time to take a step backwards. We must transition to renewable energy, ASAP!
6/1/21	Rob Sierra	Indianapolis	rsperka@pltw.org	Fracking is shortsighted. Let our state expand its leadership vision!
6/1/21	Karin Scarbrough	Columbus	klscarbrough@att.net	Please, Don't build.
6/1/21	Laurie Elliott	Terre Haute	laurie.a.elliott@gmail.com	Move to renewables!
6/1/21	Doug Dunlap	Kokomo	dmmxlire765@yahoo.com	We need renewable energy. Not fossil fuels!!!!

6/1/21	Courtney Davis	Mooresville	cldavis5181@gmail.com	As a lifelong resident of Indiana, I urge you to adopt clean energy policies.
6/1/21	A O 'Shea	Indianapolis	artbyannie@yahoo.com	Delaying the transition to cleaner energy will only make the problem much bigger and that much harder to correct!
6/1/21	Meg Lagodzki	Bloomington	mlagodzki@gmail.com	Fracked gas is not the future of energy! Leave the fossil fuels in the ground and switch to renewables for a cleaner, healthier Indiana.
6/1/21	Stephen Lord	Indianapolis	stevelord54@hotmail.com	It is shameful that as a corporation you are putting your profits ahead of the health of your customers. This isn't the 19th century, shame on you.
6/1/21	Kim Sackmann	Unionville	sackmann.kim@gmail.com	You're mission statement sounds eco friendly and your fracking start ups tell on you. Ethics in business is the 21st Century paridigm. Marketing should reflect this as well as being transparent snd factual. What is your stand point on fossil fuel?
6/1/21	Breana England	Columbus	bengland2014@hotmail.com	Please, this is the only world we have. Don't let greed destroy it. Think of the planet, the beauty within it. Whether it comes from society, nature, God, pets, or your cherished loved ones; by going through with the decision you will have planted a seed of destruction. A seed that once matures creates an invasive, smothering vine to everything we and you hold dear. Please reconsider and find another way. There is always a better choice.

6/1/21	Ann Hughes	Cicero	annie7624@gmail.com	I have seven grandchildren and in a few years may have great-grandchildren. It matters very much to me how damaged our planet is when they are grown. We KNOW how valuable coal was as an energy source in the past, but now we also know what burning coal does to our environment. It is time for Duke Energy to be a leader in renewable energy. Words don't count...actions do!
6/1/21	Elise Edwards	Indianapolis	metrotima@gmail.com	I live in Indy, which is already one of the more polluted major cities in the U.S. Indians doesn't need any more exploitation of unsustainable energy sources?we need to move on! I would be happy to pay more for cleaner energy. Would love to see Duke move in the right direction.
6/1/21	Maddie Barbar	Indianapolis	maddie.barbar@icloud.com	clean energy rocks ??
6/1/21	Philip Johnson	Carmel	philip.johnson@ascension.org	As a Preventive Medicine and Family Medicine physician, I can not urge you strongly enough to avoid supporting any fracked gas projects.
6/1/21	Yuvonda Wickwire	Indianapolis	ygwick@aol.com	You can do better than this.
6/1/21	Rebecca Noot	Carmel	rnoot@sbcglobal.net	Let's be global LEADERS by moving to renewable energies and showing everyone else how things can be done, as we did after WWII. Germany is leading the way now and it's showing economically! Why not take the reins?!??
6/1/21	Deborah Spurlock	New Albany	spurlock.da52@gmail.com	I am not too happy about fracking. It seems to cauze earthquakes.
6/1/21	Melinda Douthitt	Indianapolis	melindapafe@aol.com	It's inevitable and the best policy
6/1/21	Mackenzie Mcclara	Greenwood	mcclamac000@gmail.com	How are we going to fix problems when you keep setting us back. Stop setting us 3 steps back and let us step forward.

6/1/21	Connie Aveline	Lafayette	caveline@comcast.net	No fracking. Alternative sources less harmful please
6/1/21	Helen Johnson	Indianapolis	happycat1945@yahoo.com	Practice what you are saying! No cracking plants or coal!
6/1/21	Julie Knott	Seymour	jmlknott@frontier.com	Fracking is too dangerous to continue. Please stop. It effects ground water and causes pollution. It is not worth the problems it causes. No more!!!!!
6/1/21	Cheryl Gregory	Indianapolis	cgreg711@sbcglobal.net	Please move into the 21st century, and get on board with protecting this land for our children. Thank you.
6/1/21	Greg Grant	Unknown	greg.l.grant@gmail.com	Any further investment in fossil fueled power generation is just plain wrong (and Duke Energy management and board knows it, which makes such negligence deliberately harmful and therefore criminal), since we need to be replacing all such powerplants with renewable solar, wind, heat pumps, energy storage and energy efficient appliances, efficient variable-speed motors, LED lights and other energy conserving devices, to minimize the economic, health and environmental costs of overloading our atmosphere with greenhouse gas pollution.
6/1/21	paltmeyeralvey@gmail.c	Indianapolis	paltmeyeralvey@gmail.com	Frackong is boyhr dangerlud tonyhe environment snd prople. DO NOT FRACK ANYWHERE!!!
6/1/21	Etalida Morecraft	Peru	carstenloe@outlook.com	I LIVE IN INDIANA AND I DON't WANT THIS!!! I AM ONE YOUR CONSTITUENTS!!!
6/1/21	Ellen Corcella	Indianapolis	lawyerartist@gmail.com	Start embracing safe energy practices, it is not that difficult. Imagine a clean future!

6/1/21	Robert Pedersen	Zionsville	rpedersen@indy.rr.com	Fracking to extract natural gas not only increases the probability that this potent greenhouse gas will leak and accelerate global climate change. In addition, the process of fracking itself has been responsible for ground water contamination as well as causing serious damage from earthquakes. The extractors tried to claim they weren't responsible for this damage, but the evidence of their culpability became undeniable. Smart fossil fuel companies are turning away from their historic and destructive products to invest in solar and other renewable energy. It is a no-brainer that Duke should do the same!
5/28/21	Emily Kelly	Unknown	emilykelly31@gmail.com	I desire to leave this planet a clean and healthier place for my children. Coal is destructive to our planet and health. I strive to have cleaner energy, eliminate fracking and transition to cleaner renewable energy!
5/26/21	Jennifer Younger	Unknown	jenyounger68@gmail.com	As a Hoosier, we can do better! Be part of the solution and increase your commitment to renewable energy.
5/26/21	Tyler Pauley	Fishers	tyrypauley@gmail.com	These types of reforms cost money, but it iscritcal that Duke involve its stakeholders and make these green transitions immediately.
5/25/21	Hope McKim	Jeffersonville	sahcen99@yahoo.com	I am a long time Duke residential customer and hope that Duke Energy will take this issue seriously. Energy needs to move away from coal fired plants and carbon emissions to renewals and environmental friendly power generation. And, we need to do this now to stop ruining our environment. It is not about affording it, rather about the right thing to do for our planet and its people.

5/24/21	Julia Lindenschmidt	Evansville	jujuc_2000@yahoo.com	Our children need clean air and water. Please go solar.
5/23/21	Lisa Talcott	Lafayette	weamom@gmail.com	"Do the best you can until you know better. Then, when you know better, do better." Maya Angelou Recent advertising indicates that Duke is "moving beyond coal." This tells me that you already know better. Yet, the latest 20 year plan doesn't indicate that you are acting on that knowledge, but continuing to heavily rely upon coal. Please make definitive changes for the betterment of our environment and for the benefit of our present and future inhabitants, both human and otherwise. Thank you!
5/22/21	June Rogers	Lafayette	junelrogers@comcast.net	Let's commit.
5/22/21	Terry McCain	Unknown	terry.mccain@gmail.com	We are a Duke customer with solar. Please help our environment and eliminate coal from your energy plan!

5/21/21	Sandra Cole	Portage	sandra.cole.13@hotmail.com	You would be out of touch if you don't realize it is time to transition to energy that will not worsen climate change. Coal is not clean and the industry is disappearing because there are more efficient, clean, renewable sources. To compete with China innovation is the new direction we must go. Fracking wastes a valuable limited resource we can no longer afford to waste, water. Fracking contaminates and uses millions of gallons, sometimes making peoples' water flammable, rendering their homes unlivable and worthless. Contaminated groundwater is no joke.
5/19/21	Felicity Kelcourse	Indianapolis	jkel7777@gmail.com	Dear Duke decision makers, Marion County Hoosiers deserve better than an F for ozone and a D for particulate pollution (as shown on the Ahttps://www.lung.org/research/sota/city-rankings/states/indiana/marion). Dirty coal is giving our kids asthma and elderly COPD and is destroying the Appalachian communities it comes from. The time to transition to clean energy is now. Please take the need to urgently transition away from fossil fuels seriously, for the sake of your children and grandchildren. They deserve a better world, not one that's less viable than the one we older people grew up in. Dr. Felicity Kelcourse, Christian Theological Seminary

5/12/21	Cassie Evans	Unknown	evans0410@gmail.com	As a Purdue student I urge you to look back at the actions this company has taken that cannot be reversed. Times are moving forward and so should Duke. I encourage you to consider the people over profit.
5/9/21	Marie Sepeta	Granger	mcsepeta@hotmail.com	Climate Crisis must be addressed right NOW! DUKE, IN is building their future on old-fashioned, pollution-causing tech. Why are they so backwards?
5/9/21	Carl Barnett	Goshen	carleb@goshen.edu	I live in Goshen, IN, so what Duke Indiana uses to produce energy directly affects me. We must all face the scientific facts which are that climate change is *very* real and *very* dangerous...Energy companies must be on the front line of change since energy production is so deeply involved (presently) with using fossil fuels. I implore & even demand that you move toward more renewable energy production sources immediately. There is no time to lose. *You* are responsible for the well-being of our climate on wihch we all depend.
5/7/21	Richard Gawthrop	Franklin	rgawthrop@franklincollege.edu	We are Duke customers.
5/4/21	Joab Schultheis	Evansville	jschultheis@protonmail.com	Limiting the worst impacts of climate change requires leadership and immediate action. It's time for Duke Energy Indiana to rapidly transition away from coal to cheap, clean, renewable energy. As a resident of southwestern Indiana I look forward to the day when coal-powered facilities like your Gibson plant no longer pollute our air and threaten our water quality.

4/30/21	Karen Jackson	Lafayette	karway44@comcast.net	For the environment's sake plus the sake of Indiana's future for good paying jobs, please begin the transformation phases needed to convert from coal to a more green source of power.
4/30/21	Susan Heitzman	Vevay	susanhallheitzman@frontier.com	We moved in December and are now customers of Duke Energy. We appreciate the good service. We do not appreciate the amount of pollution in the Ohio Valley now that we are only three blocks from the Ohio River. We do not appreciate the coal barges, even passing each other on the river. We were so pleased to see the Jennings County Library and now the City of North Vernon become solar energy hubs before we left our place near Vernon where we were customers of Southeastern Indiana REMC. Please wake up, please think about the future of our grandchildren and their children and grandchildren. Before it is too late. Duke energy and all corporations who put their share holders before the planet and the future make we who are in our late 70s very sad.
4/29/21	Alexander Esche	Noblesville	aesche@gmail.com	Indiana needs clean energy!
4/29/21	Thomas Marshalek	Bloomington	tom@bloomingfun.com	If you don't go as quickly as possible to utility-scale wind and solar, you'll be obsolete once Tesla wises up and goes utility-scale alongside rooftop solar. Or, you'll simply become known as one of the worst planet killers.
4/29/21	Linda Anderson	Noblesville	la19471908@gmail.com	Let's continue toward clean energy and new jobs

4/29/21	Zolt Levay	Bloomington	zgl@me.com	We must transition away from fossil fuels for the health of the planet and humanity. Duke Energy is ideally positioned to be in the forefront of this transition to renewable energy sources, with its vast resources and dedicated workforce.
4/29/21	Helen Mccormick	New Albany	newalbanyann16@gmail.com	Duke Energy prices are too high. Switch to solar or wind. Either is cheaper.
4/29/21	Rhonda Mathes	Franklin	rhon1963@yahoo.com	Be part of the solution, not the problem, go solar and help the rest of us do the same.
4/29/21	Steven Wilson	Seymour	stvnwlsn@hotmail.com	It's time to clean up your dirty mess.
4/29/21	Roberta Schonemann	West Lafayette	schonem@gmail.com	Time is running out. It is clear that climate change is creating real problems for maintaining life on this planet. How much more flooding, burning, immigrating can be sustained. I am doing all I can to reduce my carbon footprint,. but it is the gigantic footprint of the fossil fuel industry that needs to be reduced. Individuals alone cannot.
4/29/21	Catherine Mattei-Willian	Greenwood	cmw912011@hotmail.com	Please pay attention and reinforce your foundation to aggressively facilitate energy w/o fossil fuels.
4/29/21	Jane Wackowski	Nashville	hofo66@icloud.com	No fracking! Get on board the clean energy agenda.
4/29/21	Joshua Ploss	Lafayette	plossj067@hotmail.com	I would very much like to leave a better world for my children, and transitioning away from coal would be a great step for that.
4/29/21	Laura Matyi	Brownsburg	lmatyi1@sbcglobal.net	It's time to start cleaning up the mess you've made of Indiana. Fracking is unnecessary. The future is clean energy and nothing to do with coal is clean!

4/29/21	Swathi Williams	Carmel	swathiwilliams@yahoo.com	To: Stan Pinegar, President, Duke Energy Indiana, Please shift energy production away from fossil fuels and towards renewable sources. The sooner the better. The less we use the better for our environment. It won't last forever anyway. Let's plan ahead so we can prepare for that day. As you develop Duke's 20-year energy plan, we, your customers, urge you to take action on the climate crisis: - Move beyond coal before 2030 - Eliminate fracked gas plants from your plans - Transition to 100% affordable, renewable energy before 2030 Fossil fuel pollution harms our environment and climate. Low-income communities and communities of color suffer disproportionate damage that is especially visible during this unprecedented time of global hardship. Utilities across the state and country are moving quickly to provide customers with inexpensive, clean, renewable energy, while protecting impacted communities and workers in the process.
4/28/21	Bridget McKinney	Unknown	bmmcairo@yahoo.com	It makes economic sense for you and your customers in the short and long term. It makes common sense to help prolong our planet.

4/28/21	Joseph Kotva	Elkhart	kotva@outlook.com	Frankly, I'm angry that Duke doesn't care what it is doing to our children and to vulnerable populations. Utilities are a public trust with responsibilities to everyone, not just stockholders. They should be shutting down all coal within three years because coal does terrible public health damage and is a major driver of climate change. Frankly, if the executives care about their own children and grandchildren, they would be rushing to get out of all fossil fuels.
4/28/21	Iris Cushman	Lafayette	iris@wildirisclay.com	Come on, Duke. This is the future. Please get with the program! Climate change is a huge issue for me and so so many people! The longer we wait to make effective changes to the way we harness energy, the more expensive it is in the long run to fix the short-sighted actions you and other companies make today. And that cost will be on TAXPAYERS like me. This is not okay.
4/26/21	Claire Kaneshiro	Indianapolis	clairesofiak@gmail.com	My name is Claire Kaneshiro and I am a high school student in Indianapolis Indiana. My grandfather worked in the coal and steel industries, therefore I know the importance of coal to communities. However, Indiana needs to look forward. Renewable energy sources, from wind to solar, are economically, environmentally, and ethically our future. Look up, don't invest in the energy of the past, invent in the energy of the future.

4/23/21	Linda Downer	Unknown	ld09283@hotmail.com	My frustration is at a peak with Duke, the coal industry and the Indiana legislature. We must focus on our future energy uses, and how it can be can be done sustainably without damaging our health through bad air, water, and land pollution.
4/23/21	Patricia Chang	West Lafayette	tpc1133@aol.com	Air pollution hurts children with asthma; and others with respiratory ailments. Air pollution speeds up global warming/extreme climate change. That affects all of us.
4/23/21	Manuel Sone	Evansville	md.sone6@hotmail.com	It is our responsibility to leave this state, our nation in a better course than when we were born as a legacy to future generations. We are witnessing the effects of our pollution, of a few decades, in current climate catastrophes on land, rivers and oceans. Every corporation, Duke Energy among them, has a moral responsibility to contribute positively so future generations can have a healthy place to live.
4/23/21	Bruce Russell-Jayne	Carmel	brussell-jayne@uuma.org	As a customer, I want clean power.
4/23/21	Melissa Roth	Unknown	melissa3michelle@gmail.com	We have a narrow window to ensure that your grandchildren don't curse your name, and all of our names for not saving the only known habitable world in the universe for human life. Do what you need to. Make the next meeting awkward. It will be tougher to do what is needed, but that is how it always is. I believe Duke is up to the challenge if they put their mind to it. The only other option is failure.

4/23/21	John Schleeter	Westfield	john.deanna68@comcast.net	Come on Duke. We can do this !! iIt is our respiratory health at risk, especially our children's ???
4/23/21	Denise Cotton	Unknown	dmontjoygrimes@gmail.com	I want a sustainable Earth for my children and grandchildren.
4/22/21	Beth Lau	Bloomington	beth.lau@csulb.edu	It is long past time to transition to cleaner energy than coal. Please help improve the environment and human health.
4/22/21	Faybian Taylor	Unknown	faybian_taylor@hotmail.com	Move forward into the future and welcome it - you'll either be dragged along or be a leader.
4/22/21	Vicki Brown	Ossian	vicb53@yahoo.com	Please help the earth and it's citizens.
4/22/21	Michael A Mullett	Columbus	mullettgen@aol.com	Stan - You know how I have felt for a long time on this matter -- it is long past time for Duke to take dramatic action in the near-term on a Deep Decarbonization and Rapid Electrification Scenario here in Indiana! Mike
4/22/21	Ted Kunkel	Bloomington	tedkunkel@yahoo.com	There is no reason for failing to move toward renewable, clean energy NOW! Hoosiers deserve to know your plan for making that happen.
4/22/21	Lawrence Conway	West Lafayette	lconway5001@aol.com	Let's just do it for each other!!!
4/22/21	Susie Tatum	Westfield	rska.tatum@comcast.net	please embrace the future and help more to fight climate change! We need your help!
4/22/21	Nathan Pingel	Unknown	npingel341@gmail.com	Renewables are already cheaper, especially with Biden moving to end fossil fuel subsidies, I'm also a fan of dodging climate apocalypse.

4/22/21	Ethan Hess	West Lafayette	hess54@purdue.edu	Anthropogenic climate change is an existential threat to humanity. We are coming ever closer to the point of no return, and corporations are almost entirely responsible. It's time to at least start to take steps towards protecting our world and protecting our country.
4/22/21	Abbi Williams	Vincennes	will2122@purdue.edu	By committing to a plan that focuses on renewable energy, you will help to strengthen not only Indiana but the US dependency on energy that is sustainable and clean. As an indiana resident I understand the it's an improbable idea to 100% transition to renewable energy, but I think it would be a great show of resilience and would move the energy sector in the right direction if you did increase the amount of renewable energy in Indiana.
4/22/21	Linda Evinger	Evansville	levinger@usi.edu	Coal is much dirtier energy than renewables. Make the change and employ the workers in better jobs.
4/22/21	M. Jones	Indianapolis	pelmel677104@att.net	This is important for our state.
4/22/21	Rebecca Kornick	Angola	rkornick2@yahoo.com	Indiana has the space to add more wind energy and other renewables. May Duke be part of protecting our planet's future!
4/21/21	Walter Mueller	Valparaiso	wtkd@hotmail.com	Don't any of you have kids or grandkids? You're not stupid people - you KNOW what you're doing is wrong! Go home tonight, take a good look at your kids, and envision the kind of future you are building for them. They are the ones you will have to account to...along with God.

4/21/21	Elsa Barron	South Bend	elsa.m.barron@gmail.com	As a person of faith, I believe that I am called to care for our neighbors and to care for creation. Continuing to rely on fossil fuels for energy in Indiana will ultimately devastate communities that will experience the effects of global warming and climate change with more extreme heat days, increasing and intensifying natural disasters, and decreasing biodiversity and environmental health. A just transition to renewable energy is needed to ensure a sustainable future for our communities in Indiana and beyond.
4/21/21	Mark Jungemann	Carmel	markjungemann@gmail.com	We are long-term Duke Energy customers, and we support green energy alternatives. Please think long-term along with your customers and make your energy from non-polluting sources.
4/20/21	Rabbi Justin Kerber	Carmel	rabbi.justin@gmail.com	I've been visiting Cape Cod since I was a child. I would like my children and grandchildren to be able to visit it as well. My wife and I visited the Athabasca glacier on our honeymoon in 1998. At that time, it had retreated more than a mile from a visitors' center built in the 1920s. Will we let it retreat all the way into nothingness? Our family just discovered the Indiana dunes, and we'd like to keep enjoying them.
4/19/21	betsy kachmar	Fort Wayne	betsy_kachmar@yahoo.com	I have worked for public transit most of my career. In retirement I am part of an Active Transportation Coalition that encourages people to walk, bike or bus more. It is better for their health & the environment. I encourage you to make corporate changes that will also improve the health of your family & Mother Nature.

4/19/21	Rosie Miller	Oldenburg	rosieosf67@gmail.com	Take leadership and be a company for the future by investing in renewable energy and divest from dirty , harmful gas and coal.
4/16/21	Julia Lowe	Columbus	j_lowe66@yahoo.com	Please quickly transition to 100% affordable, renewable energy before 2030. I have been against fracking since I learned about it over a decade ago. Nothing good comes from fracking. In my opinion, it's a backward choice to continue fracking for fossil fuels and Duke is responsible for the destruction of our natural landscape and our water aquifers. Fracking and fossil fuel extraction and use endangers humanity and our natural resources.
4/15/21	Adriane Jagger	Chesterton	adrianejagger@hotmail.com	Indiana is the most polluted State in the country. What a shameful legacy to hand our children.
4/15/21	aida mk	West Lafayette	amegatsuki@gmail.com	Duke needs to get out of the surface of this earth ! Coal is terrible for the environment, coal miners and it is not even a cheaper alternative ! What a scam !
4/12/21	Angela Vinson	Unknown	lalavinson@gmail.com	The time is now!
4/12/21	Carol Dunn	Unknown	cjanedunn@gmail.com	My faith leads me to point out that it is well past time for utility companies to move rapidly to renewable energy. We have less than 10 years to reduce our carbon emissions by 45%. This means Duke Energy must be a part of the effort to reduce emissions by eliminating coal in the next few years.
4/12/21	Jean Ballard	Ferdinand	jballard@thedome.org	Think of all the lives negatively affected by fissil fuel pollution. We have a moral responsibility to move away from fossil fuels asap. Think of people's lives.

4/12/21	JEAN TATUM	Indianapolis	tatum.jean@gmail.com	To protect Indiana and move forward with renewable energy please do not build fracked gas plants. Listen to your Indiana citizens and move toward renewable energy sources!
4/11/21	Lora Marie Williams	West Lafayette	ladyloramariewilliams@gmail.com	As a Regustered Nurse I took an oath to advocate for patients. Fossil fuels poison our world. Do the right thing please. Thank you.
4/11/21	Ann Bessenbacher	Unknown	bessenba@hotmail.com	Please do the responsible thing and think beyond the bottom line. This is for everyone.
4/11/21	eva Trautmann	West Lafayette	eva.trautmann18@gmail.com	Fossil fuel pollution harms our environment and climate. Low-income communities and communities of color suffer disproportionate damage that is especially visible during this unprecedented time of global hardship. Utilities across the state and country are moving quickly to provide customers with inexpensive, clean, renewable energy, while protecting impacted communities and workers in the process.
4/11/21	Annica Dong	Unknown	asparklestar@gmail.com	Don't wait until last minute to change things. I hope you fully realize that our planet is dying and you must change now. It took me a while to realize it too.
4/11/21	Samantha Mihail	Merrillville	samanthamihail@gmail.com	Get ahead of the curve NOW and be a leader in clean transition. Folks in Indiana will be really responsive to clean job creation!!!
4/11/21	Walaa Abdo-Baati	Unknown	winta3willow@gmail.com	You are only ruining the health of millions of Hoosiers. No biggie.

4/11/21	Jeffrey Romer		drjaromer@gmail.com	In addition to renewable energy sources, I also believe that newer nuclear technologies may need to be part of the picture , in order to reduce CO2. I also believe natural gas can be part of the portfolio if it is strictly captured from sites where it is currently leaking into the atmosphere (no continued fracking). Thank you for your time and attention to this matter.
4/10/21	Jennifer Higginbottom	Unknown	vwords@gmail.com	It's time to become good ancestors for future generations!!
4/10/21	Mary Firestone	Lafayette	marythomasfirestone@gmail.com	Please! Fossil fuel free by 2030! It matters.
4/10/21	Linda Swihart	West Lafayette	swihart@purdue.edu	Mr. Pinegar -- Do you have children? Do you have or hope to have grandchildren?Be a climate hero, PLEASE.
4/10/21	Katie Rocheford	Lafayette	send2katie@aol.com	Thank you for moving to reduce the coal used.
4/10/21	Christina Wright	Unknown	clfoley21@yahoo.com	I want to have grandchildren some day. With asthma currently affecting two of my children, I hope that we can begin using cleaner energy sources to provide healthier air for further generations.
4/10/21	Brishen Vanderkolk	Lafayette	fluidme@gmail.com	Please do what's right for all of us, including your shareholders.
4/10/21	Lisa Dullum	West Lafayette	lmdullum@hotmail.com	We can do better than dirty energy.
4/10/21	Sarah Huber	Lafayette	srhhuber@yahoo.com	If Duke has control of our energy, they need to act responsibly with it. Please, Duke, step up and act ethically with the massive power and money maker you have been given. Develop a 20 year energy plan that transitions us to 100% affordable clean energy.

4/9/21	Sara Duffy	West Harrison	saraduffy@heavenwire.net	Dear Duke Energy Indiana President Stan Pinegar, In October 2019, you told the Franklin County Chamber of Commerce that Duke would diversify from 90% coal-fired plants to more natural gas and renewable sources such as solar and wind. You said that the focus on climate change and the uncertainty about future federal regulation of carbon emissions were driving the switch and Duke would speed up the retirement of two coal plants in Indiana by several years. You said Duke wants to reduce the risk of being heavily coal dependent. The company would phase in renewable energy power and transition selected coal plants to natural gas. Get it done as you said. Get it done by 2030.
4/9/21	susan thomas	Beverly Shores	sthom1113@gmail.com	Indiana is drowning in toxic coal ash--clean up your act!
4/8/21	Tracy Bee	Bloomington	iamtracyb@gmail.com	Fossil fuel pollution hurts our children. We have to think about the future and wean ourselves off fossil fuels. Other utilities are moving toward inexpensive, clean, renewable energy. Why can't Duke? Why is Duke so special?
4/8/21	Kevin Alvey	Cynthiana	info@gore-galore.com	I have been really working towards going solar by lowering our energy usage for my home and business, and duke is not helping w the process.

4/8/21	Tom Zeta	Evansville	tfzeta@gmail.com	Energy is vital, but we need to stop relying on coal powered sources. There are cleaner renewable resources that, if not less expensive currently, will become less expensive with increased demand. It's an investment in the future for all of us. Please do your part to make it happen starting now.
4/8/21	Sheila Rosenthal	West Lafayette	rosefam2856@gmail.com	We need clean energy and not dirty coal/
4/7/21	Sean Lutes	Lafayette	slutes93@gmail.com	Makes sense to move beyond it, take a lead on the matter. As a consumer I expect that of Duke.
4/7/21	Jonathan Siskind	West Lafayette	jonathan@jonathansiskind.com	You are full of empty promises. Your customers don't and won't believe you until you give them a reason to, so do the right thing and uphold your words.
4/7/21	anna franiak	Carmel	ajfraniak@outlook.com	our planet is dying but you can help.
4/7/21	Laura Matyi	Brownsburg	lmatyi1@live.com	Time to clean up your coal mess and focus on a cleaner future.
4/6/21	Chenyao Liu	Carmel	chenyao.inventor@gmail.com	I am a part of the Confront the Climate Crisis campaign. I along with the citizens of Indiana urge you to move beyond the use of coal and transition to clean and renewable energy. Air particulate pollution kills 1 in 5 people. There are countless Hoosiers that have died early deaths because of exposure to coal ash and pollution from your factories. Please keep this in mind and remember that you can't make any profits off a dead planet.
4/6/21	Annabel Prokopy	West Lafayette	annabelprokopy@gmail.com	Indiana needs to transition to renewable energy for our future. Climate change is an impending threat - it's not going to be easy to make the changes that we need to make, but we all, Duke included, need to do our part and push ourselves.

4/5/21	Brittany Harris	Unknown	brittanylharris01@gmail.com	Our future depends on this, and companies such as yours are the biggest polluters. It is our responsibility to let you know what we want, and this is it! It is your responsibility to listen. Will you listen to your customers and contribute towards a better future for all?
4/3/21	Brendan Betz	West Lafayette	loveclairevert@gmail.com	It is important to me that your company takes responsibility for the harms to our environment.
4/1/21	Lisa Gardner	Leo	ljhgard@yahoo.com	We have to take steps now to move away from fossil fuels. Other options are available!
4/1/21	Jean Ballard	Ferdinand	jballard@thedome.org	We need to stop taking from future generations their ability to live
4/1/21	Will Shields	Jeffersonville	willshields6@gmail.com	It's time to make the change. Clean air would be nice.
4/1/21	Frank Mueller	Evansville	profrankmueller@aol.com	Please change your processes
3/30/21	Nancy Gehlhausen	Oakland City	naturegirl.gehlhausen@gmail.com	"Moving beyond coal" Is just a phrase to mislead the public. What we need to be doing is moving beyond all fossil fuels.
3/30/21	Jim Grimes	Unknown	jgrimes977@gmail.com	We need to transition to clean energy. Faster the better. Surely you can find a profitable way to transition your electricity production from fossil fuel sources to clean energy sources. Other utilities are.
3/30/21	Dennis Shock	Carmel	dennis.shock@gmail.com	As the grandfather of 6 I care a lot about the future of our planet. The scientists I read keep saying we need to keep all the coal and oil in the ground to avoid catastrophic climate change. Please do the right thing and transition to clean energy by 2030! Thank you. Dennis & Diane Shock, Carmel
3/30/21	Julie Lowe	Columbus	j_lowe66@yahoo.com	Please eliminate fracked gas plants from your plans. Fracking is damaging on so many levels and it is unsustainable.

3/30/21	Paul Zeller	Indianapolis	pzeller1966@gmail.com	Indiana remains one of the most polluted states in the nation. It's high time for power companies and other businesses to do what they can to turn this around and lead the way in clean energy.
3/30/21	Katelyn Rush	Unknown	katierush14@gmail.com	Get ahead of the inevitable switch to renewable energy and succeed in the long run. Make us proud.
3/29/21	Beth Robinson	New Albany	brobrn@outlook.com	Please do not stick your head in the sand to avoid the reality and the dangers of climate change. Our planet depends on us. Our kids depend on us to make good decisions. TAKE POSITIVE ACTION NOW to move away from dependence on fossil fuel.
3/29/21	Susan Kloss	Seymour	hannahsusan@hughes.net	On a clear day my son can see the smoke coming from the tall stacks at Madison and he lives just south of Seymour. Evidence of pollution going into the air we breathe.
3/28/21	Travis Bonnett	Noblesville	tjb122982@gmail.com	Please dump coal and save our Earth!
3/27/21	Angela Gioe	Martinsville	angelagioe55@gmail.com	We need to move to clean energy to save our planet. Please, for our children and all mankind.
3/27/21	Raymond F	New Albany	raymondwisman@gmail.com	Duke has provided reliable electric service but, for the sake of our children, the future CANNOT be powered by coal.
3/27/21	Tony R Engelking	Seymour	tengelking@sbcglobal.net	Please do the right thing and go renewable by 2030!
3/27/21	ralph hornung	Unknown	ralph3353@icloud.com	there can be no healthy people on a sick planet. do your part
3/26/21	Annita Mason	New Albany	annitamae51@gmail.com	This is so important for us all to have what is best for us financially, and to be healthy.
3/26/21	Bradley Fackler	Fishers	bfackler@comcast.net	Coal is a dead end for the environment and for your business.

3/26/21	DAVID SWINEHART	Kokomo	dcswnhrt@aol.com	We must make real progress in adopting clean energy practices before we lose the opportunity forever!
3/26/21	Carol Dunfee	Morgantown	cadunfee@gmail.com	Our children's future depends on eliminating fossil fuels! Do you have children?
3/26/21	Carolyn Brown	Noblesville	carolyn.brown.indy@gmail.com	Part of what will make Indiana a desirable place to live and work in the future will be a dedication to clean energy! NO to fracking! NO to coal fired electricity generation!
3/26/21	Shannon Hayes	Franklin	sheena5785@gmail.com	This state needs to take action now! It has been been lagging behind due to inefficient government. There is no good reason to be on coal energy this day and age other than coal companies are lining the pockets of said governments here and it is shameful
3/26/21	Benjamin Everhart	Sellersburg	benjamin_everhart@hotmail.com	Indiana has some of the poorest air quality in the U.S. This shouldn't and doesn't need to be the case.
3/26/21	Linda Haas	Georgetown	lindadhaas@gmail.com	Go green!
3/17/21	Eric Riddle	Columbus	eric.r.riddle@gmail.com	Investments in renewable energy are the path forward to living on a healthy planet this century. I have nothing new to say that you haven't heard before, but I raise my voice nevertheless. Please consider those who join me in this opinion as you consider the future of your business and your customers? optimal health outcomes.
3/10/21	Wilma Davison	Indianapolis	willmalee65@yahoo.com	Encourage more people to put solar panels on their house

11/21/20	Amanda Hulse	Carmel	hulse.amanda.b@gmail.com	The dangers from fossil fuel pollution have been known for many years. Our burning of fossil fuels is disrupting the Earth's weather. Increasing greenhouse gases in the atmosphere trap the warmth from the sun. This intensifies surface and air temperatures. As a result, excess heat energy builds in our oceans and atmosphere. This extra energy magnifies the normal ups and downs of the weather, adding more heat and moisture. The impacts from dirty pollution to the people and life in the US are devastating: billions dollars of weather related disasters *annually* which are sharply increasing throughout the 1980, 1990s, and 2000s . The destruction of natural resources due to fracked gas plants is also well documented. We must transition to renewable, affordable energy before 2030. The health, the lives of humans and animals are at stake. Your customers demand climate justice.
11/19/20	Corey Pitzo	Indianapolis	cpitzo141@gmail.com	I don't need to quote the obvious here. Renewable energy is the only sustainable way forward in the future, and it will continue to be more and more economical as well. Do you want to get ahead and be a leader or fall behind using antiquated technology and practices? It's that simple.
11/18/20	Ken Tucker	Westfield	ktucker4498@gmail.com	Please, for our shared future lets move away from coal and all other fossil fuels.

11/18/20	Eric Riddle	Columbus	eric.r.riddle@gmail.com	During all strategic meetings, Duke needs to prioritize all forms of renewable energy as Duke decides how to transition into cleaner forms of energy in the 21st century.
11/17/20	Connie Kane	Carmel	crkane87@gmail.com	Time is running out to effectively address climate change. It is critical that Indiana electric utilities like Duke Energy accelerate their transition away from fossil fuels to a predominant renewable energy content.
11/16/20	Alexandra Smith	Whiteland	alsmith1627@gmail.com	Hi There! This issue is particularly important to me because I want my 4 year old daughter to be able to experience the wonders of the world. I want her and my grandchildren to have a planet to live on. Thank you for helping us protect our planet for future generations!
11/15/20	Cara Hasser	West Lafayette	carahasser@icloud.com	Our climate cannot sustain much longer if we do not change our ways. Climate change is real and we all need to start acting that way.
11/14/20	Katherine Wilcox	Unknown	katherinewilcox06@gmail.com	This matters because the future of our environment is crucial. We need to make sure we are using as sustainable energy practices as we can, to protect the future of our planet.
11/6/20	Jane Ruch	Zionsville	jegruch@yahoo.com	Please help save our planet.

10/29/20	Elizabeth Masur	Indianapolis	elizabethmasur55@gmail.com	Dear Mr. Pinegar, Last week my middle daughter turned 30. As she enters her next decade, she and her husband are examining whether or not they should have a child. They have serious reservations about becoming parents due to concerns about the polluted environment this child would enter. Unfortunately, when Quincy and Conrado observe the actions of companies like Duke Energy Indiana, with 90 percent of its energy coming from coal, which exacerbates climate change and public health, they feel it is irresponsible to bring another life into this world. At this time, there are too many concerns about how unsafe this world is because of pollution created by companies such as Duke Energy. I would like to be a grandma, but until companies such as yours start implementing clean energy strategies, holding a grandchild in my arms must be postponed. Sincerely, Liz Masur
10/29/20	Carolyn Weiss	Fishers	cweiss7@sbcglobal.net	We have to make these changes ASAP! We owe it to our children to ensure a clean, healthy earth for them and their children. To get there, we have to act NOW!
10/29/20	Diane OBrien	Indianapolis	robrien25@comcast.net	I'm 73 years old and have more difficulty breathing the older I get. Your company helps to make Indiana a state which has more superpolluters than any other state. Please reconsider and plan to transition to renewable energy by 2030.

10/29/20	Daryl Fry	Indianapolis	fry.family.in@sbcglobal.net	Please move your timetable 5 years closer to phase out coal. Think about buying up marginal farms and putting in solar panels there. Elon Musk has factory sized battery stations in Australia that store and release electrical energy to the grid. Go modern!
10/16/20	yuh yuh	Unknown	winta3willow@gmail.com	do something to help. we tired of asking
10/13/20	Ramona Rice	Unknown	rrice@ccs.k12.in.us	I've been purchasing green energy for Duke for many years, subsidizing them on my monthly electric bill to support the conversion to solar and wind. I want to see more for my money.
10/12/20	Julia Spangler	Indianapolis	braintzr2@aol.com	Pollution from coal negatively affects our air, water, and atmosphere, leading to health problems and the impending crisis of climate change. Put your company on the right side of history by phasing out fossil fuels as quickly as possible. Your children and grandchildren will thank you.
10/12/20	Jane Rapinchuk	Zionsville	mark_jane25@yahoo.com	No more coal or gas. We need to move to renewable energy yesterday. Climate change hurts indiana.
10/11/20	Gwen Ashby	Carmel	gwen_ashby@hotmail.com	I care about the future for my children and grandchildren. Please consider our plea.
10/10/20	Carl Lowry	Fishers	carlowry077@gmail.com	Coal is one of the biggest producers of green house gases in the world. If we hope for our children to have any future we must stop burning coal as quickly as possible and move to alternative energy sources (sun, wind, geothermal).
9/25/20	Edgar Mejia	Unknown	mejia21@purdue.edu	Renewable energy is cheaper in the long run because you won't have to pay an increasing cost to drill for more obscure oil
9/25/20	Kathy Parker	West Lafayette	kcfparker@gmail.com	Hi Stan, please let's get on the leading side of attaining renewable energy.

9/25/20	Emily Beckman	Silver Spring	emilybec@gmail.com	Renewable energy has been proven to be better for the people and even better financially in Indiana (https://www.forbes.com/sites/jeffmcmahon/2019/07/02/mike-pences-indiana-chooses-renewables-over-gas-as-it-retires-coal-early/#71c0b06943b4). Coal plants in particular harm the residents in the area, so please protect us and create better jobs by switching to renewable energy.
9/25/20	Gabriela Weiner	Unknown	gabrielaweiner0@gmail.com	This matters to me because it is my generation's future!
9/24/20	Kathy Parker	West Lafayette	kcfparker@gmail.com	The climate is in a crisis. The time to act is long overdue. Move to renewables to help save the earth.
9/21/20	Jonathan Siskind	West Lafayette	jonathan@jonathansiskind.com	For our children
9/19/20	Samuel Heath	Avon	sheathbar8@aol.com	This is not just an environmental issue, but a human rights issue. Duke needs to do more to support the people who provide Duke's revenue!
9/18/20	Laura Matyi	Brownsburg	lmatyi1@sbcglobal.net	If you don't start investing in clean energies your company will be left behind. Why not be seen as a leader of positive change instead of one holding on to the past for monetary gain.
9/17/20	Katey Watson	Lafayette	watsonkatey@gmail.com	Coal is not a sustainable energy source. There are so many newer, renewable energy sources that will be better for the environment, our communities, and will probably save money in the long run.

9/17/20	Alli Chaney	Lafayette	alli.chaney1@gmail.com	The west coast is on fire, half of our nation is covered in smoke, there's 5 storms in the south right now, and more. It's past time to care about our planet. This isn't "too expensive" as the alternate is the complete corrosion of our planet.
9/17/20	MELISSA GRUVER	Lafayette	melissadgruver@gmail.com	Every day is a great day to do the right thing. Those of us that rely on power to live know that renewable energy and a clean green future is better for us all!
9/17/20	Emily Rames	Lafayette	emmajeanne.dftba@gmail.com	It is ridiculous that in 2020 coal is still being mined, the Earth is being destroyed, and people are being harmed because Duke doesn't want to do the easy work of transitioning to solar, wind, and nuclear energies and give people the training for safe job transitions! Coal powered energy harms everyone across the board and a better way is possible!!!
9/17/20	Annabel Prokopy	West Lafayette	annabelprokopy@gmail.com	It is unacceptable that Duke has not committed to a plan that ensures the safety and well being of the planet for future generations. Keeping coal plants and other fossil fuel burning plants running past 2030 will hold major and devastating consequences.
9/17/20	Roxanne Bischoff	Lafayette	bischoffrox@gmail.com	If not now , when. We have to make a change !
9/17/20	Sara Poer	Unknown	sarajpoer@gmail.com	Our communities deserve clean reliable energy. Please move away from coal and towards energy that is safe to use and safe for the communities its made in.

9/17/20	Carmen Wickware	Lafayette	carmen.wickware@gmail.com	Several members of my family have been affected by the environmental impacts of coal. The emissions, however clean you can get them, still cause harm in surrounding areas. Many of the communities around coal plants are low-income or farming communities that suffer GREATLY when air and water quality are poor.
9/14/20	Julia Lowe	Columbus	j_lowe66@yahoo.com	Please listen to the rate payers and understand how much we support clean energy. We want more than what Duke is offering which is environmentally expensive fracked gas and dirty mined coal. What I want is for Duke to invest in clean affordable renewable energy.
9/14/20	Shani Laskin	Lafayette	sonia.laskin@gmail.com	I am from Washington state and the wild fires as of late have made it abundantly clear to me that climate change is not some danger waiting for us in 2030, it is here right now. I urge Duke Energy to move beyond coal to save the people and communities that it serves.
9/13/20	Delma Mindel	Zionsville	dmindel145@sbcglobal.net	It's beyond time to move to energy methods that are clean, non-.polluting, and incredibly harmful to our health and the environment! Get with it for heaven's sake!
9/12/20	khloe goodman	Battle Ground	khloegoodman82@gmail.com	Dirty energy is not cheap. Prioritize people over profits. Move from dirty energy.

				To: Stan Pinegar, President, Duke Energy Indiana, As you develop Duke's 20-year energy plan, we, your customers, urge you to take action on the climate crisis: - Move beyond coal before 2030 - Eliminate fracked gas plants from your plans - Transition to 100% affordable, renewable energy before 2030 Fossil fuel pollution harms our environment and climate. Low-income communities and communities of color suffer disproportionate damage that is especially visible during this unprecedented time of global hardship. Utilities across the state and country are moving quickly to provide customers with inexpensive, clean, renewable energy. It is time for you, Duke, to follow suit.
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