Brad Borum
Indiana Utility Regulatory Commission
101 West Washington Street, Suite 1500 East
Indianapolis, Indiana 46204 -3419

December 4, 2019

Re: Duke Energy Indiana's 2018 Integrated Resource Plan

Dear Dr. Borum

Indiana Advanced Energy Economy ("Indiana AEE") respectfully submits this letter of comment regarding Duke Energy Indiana, Inc. ("Duke Indiana")'s 2018 Integrated Resource Plan ("IRP") to the Indiana Utility Regulatory Commission ("Commission").

Advanced Energy Economy ("AEE") is a national business association representing leaders in the advanced energy industry. AEE supports a broad portfolio of technologies, products and services that enhances U.S. competitiveness and economic growth through an efficient, high-performing energy system that is clean, secure, and affordable. AEE has been operating in the Hoosier state as Indiana AEE since 2016. In Indiana, AEE aims to drive the development of advanced energy by identifying growth opportunities, removing policy barriers, encouraging market-based policies, establishing partnerships, and serving as the voice of innovative companies in the advanced energy sector.

First, Indiana AEE appreciates the stakeholder process that Duke Indiana held with regard to this IRP and its consideration of the feedback it received. Indiana AEE supports Duke Indiana's stated criteria for evaluating various energy pathways over the next 20 years, including lowered costs, increased resource diversity, and flexibility, and applauds Duke Indiana's deployment of renewable energy and storage as cost-effective and reliable resources.

In our comments, Indiana AEE makes 4 main points: 1) By deploying additional renewable energy and storage on a more expedited timeline, Duke Indiana could realize greater

savings; 2) Duke Indiana should add more renewable and storage capacity to its preferred portfolio to account for near-term commercial and industrial demand; 3) Demand side resources could be incorporated more heavily into Duke Indiana's preferred portfolio; and, 4) The Commission should closely scrutinize Duke Indiana's plan to invest in combined cycle gas plants against cost-effective advanced energy alternatives.

1. **Indiana AEE supports a portfolio that increases Duke Indiana's use of renewable energy and storage in both the short and long term because it will offer affordable energy to Indiana ratepayers.**

Indiana AEE supports an investment approach that more aggressively relies on advanced energy as it will provide the maximum amount of consumer savings to ratepayers. To that end, Indiana AEE recognizes the many benefits of Duke Indiana's preferred portfolio plan to add 1,600 MW of solar, 700 MW of wind, and 15 MW of energy storage. As we will cover in further detail below, this approach recognizes that advanced energy resources are the most cost-effective resources available today. These resources meet Indiana's changing energy needs while supporting electric vehicle-related load growth and a more reliable, resilient, and flexible grid. Additionally, these investments will help meet the demand of Indiana's largest energy users, which are asking utilities to invest in more advanced energy resources and to offer programs that allow them to source their energy needs from 100% renewable energy options. However, Duke Indiana could realize even more benefits and more cost-effectively meet the needs and wants of its ratepayers by modifying its preferred portfolio to include more renewable energy and storage.

Market analysis demonstrates that advanced energy resources are the most cost-effective investment. In its latest annual publication showing its levelized cost of energy analysis, Lazard, a financial advisory and asset management firm, showed the continuation of a multi-year trend of falling costs for advanced energy technologies, particularly with regard to utility scale solar. In certain scenarios, renewable energy costs have decreased to the point that wind and solar are now at or below the marginal cost of existing conventional generation. When you take government incentives into account, the cost of building new onshore wind ($28/MWh) and utility scale solar ($36/MWh) projects is competitive with the marginal cost of coal ($34/MWh) and nuclear generation ($29/MWh).[1]

This new economic landscape was evident in 2018 utility regulatory filings across the United States. Examples include but are not limited to: Rocky Mountain Power's approved proposal to retire 3,500 MW of coal in favor of new wind and solar in Idaho;[2] Consumer Energy Co.'s

[1] *Levelized Cost of Energy and Levelized Cost of Storage 2018*. Lazard. November 7, 2019.
[2] *See generally In the Matter of PacifiCorp DBA Rocky Mountain Power's 2017 Integrated Resource Plan.* Case No. PAC-E-17-03.

proposal to retire four coal units in favor of solar and energy storage in Michigan;[3] and Xcel's proposal to retire two coal plants in favor of wind, solar, storage, and natural gas assets in Colorado to save approximately $215 million.[4]

Indiana is no exception. Recent modeling found that over half of the coal plants in Indiana are already no longer cost competitive with nearby wind and solar, and that by 2025, all of Indiana's generation will be substantially at risk economically.[5] For example, in their most recent IRP, the Northern Indiana Public Service Company ("NIPSCO") found that the most cost-effective plan for its ratepayers was to replace traditional coal generation with solar and wind, often paired with storage, while also investing in a mix of demand-side resources. NIPSCO's analysis determined it could save customers over $4 billion over the next 30 years by eliminating coal entirely by 2028.[6] Indiana AEE strongly supported NIPSCO's IRP proposal as a cost-effective approach for ratepayers and commends Indiana for becoming a national leader in the deployment of advanced energy resources. Subsequently, NIPSCO has announced a request for proposals for 2,300 MW of solar and solar plus storage and 300MW of wind. This capacity will be in addition to the 800 MW of wind energy that NIPSCO solicited earlier this year.

Despite the strong example of NIPSCO, Duke Indiana's preferred portfolio adds only 1,600 MW of solar, 700 MW of wind and 15 MW of energy storage over its long term planning horizon. Given Duke Indiana's larger service territory in the state, Indiana AEE supports buildout that reflects the current opportunity of advanced energy in Indiana and argues that NIPSCO's cost assumptions should, at minimum, serve as baseline for Duke Indiana's modeling.

Despite the cost trends in Indiana and the country at large, Duke Indiana does not plan to retire its Cayuga coal units and some Gibson units until 2028 and 2034 respectively. Indiana AEE strongly encourages the Commission to closely examine Duke Indiana's cost assumptions regarding the existing coal fleet compared to advanced energy technologies. Specifically, we question the assumption that the variable operating costs of solar per 800 MW tranche would increase by as much as $5/MWH.[7] We also strongly encourage Duke Indiana to more thoroughly review the benefits and opportunities of energy storage, using NIPSCO's cost assumptions as a baseline, and request more information about the practical constraints that prevent Duke Indiana from entertaining scenarios that develop over 2,500 MW of solar, 250 MW of wind and 250 MW

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[3] *See generally In the Matter of the Application of Consumers Energy Company for Approval of its Integrated Resource Plan Pursuant to MCL 460.6t and for other relief.* Case No. U-20165.
[4] *See generally 2016 Electric Resource Plan.* June 6, 2018. CPUC Proceeding No. 16A-0396E.
[5] *The Coal Cost Crossover: Economic Viability of Existing Coal Compared to New Local Wind and Solar Resources.* Gimon et al. March, 2019. Energy Innovation and Vibrant Clean Energy. Page 10.
[6] *See generally The Indiana Public Service Company LLC 2018 Integrated Resource Plan.* October 31, 2018.
[7] *The Duke Energy Indiana 2018 Integrated Resource Plan*. Volume 1. July 1, 2019. Page 59.

of batteries in new capacity annually.[8] Given the 20 year planning horizon of this IRP, the current economics of advanced energy, and the expectation of continued cost declines of advanced energy technologies, we hesitate to support these types of absolute limits over the long term.

Lastly, energy storage offers numerous benefits to the grid as a key enabling technology to maximize the benefits of wind and solar and to effectively integrate them into the grid. Increased use of energy storage as a capacity, energy, and ancillary services product can provide numerous benefits including significant consumer and utility savings. Pairing renewables with battery storage at key locations throughout a utility's terrority can generate noteworthy benefits in added system reliability and transmission and distribution congestion relief. For example, a 2018 Indiana AEE report found that adding 139 MW of well-sited battery storage could avoid $103 million in costs over 10 years. If 329 MW of cost-effective battery storage is added, benefits could reach $311 million.[9]

2. **Large energy users in Indiana demand renewable energy options from utilities because they value an affordable and reliable electricity supply.**

On top of the consumer benefits of advanced energy, Indiana consumers, particularly large energy users, are seeking to have their electricity come from locally-sourced renewable energy. It is not a new trend that the ability to control energy costs and sources is a critical business priority for large commercial and industrial customers. As renewable energy technologies such as wind and solar continue to drop in price, they are increasingly attractive option for companies seeking to lower costs while protecting against fluctuating fuel prices. Already, 71% of Fortune 100 companies and 43% of Fortune 500 companies have set ambitious corporate sustainability goals.

As the Commission is aware, nine companies with Indiana operations sent a letter in August 2019 to the 21st Century Energy Policy Development Task Force calling for more renewable energy access through utility programs. These companies included Berry Global, Best Buy, Cummins, Eli Lilly and Company, General Motors, Salesforce, Skjodt-Barrett Foods, Unilever, and Walmart.[10] In that letter, the companies noted that demand for renewable energy by large energy users has resulted in significant market activity; since 2013, voluntary renewable energy procurement by businesses has driven over 15 gigawatts (GW) of new, large-scale renewable

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[8] *Id.*

[9] *Potential for Peak Demand Reduction in Indiana.* Prepared for Indiana Advanced Energy Economy by Demand Side Analytics, LLC. February 2018.

[10] *See letter re: Hoosier business request that the 21st Century Energy Policy Development Task Force support renewable energy access.* August 20, 2019.

energy projects—enough to meet the annual electricity needs of approximately 3 million households. However, of the 15 GW of corporate renewable procurement across the nation, under 2 GW (less than 15%) has been procured through utility offerings.

In a forthcoming report, Indiana AEE will demonstrate that up to 3.6 GW of renewable energy demand from the commercial and industrial sector exists in the state through 2030.[11] Indiana AEE believes that Duke Indiana should revise its renewable energy buildout projections upward in order to adequately account for large commercial and industrial demand as driven by existing and future corporate renewable goals.

In order for Indiana to stay competitive and to attract these businesses with renewable energy goals to the state, utilities should offer options to customers that allow companies to contract for or purchase the output of renewable energy directly through their local utility. With properly structured utility offerings, Indiana has an opportunity to be a national leader in meeting C&I demand for renewable energy sources, while meeting other important policy goals for the state including providing low-cost energy options, enabling economic growth, and encouraging cleaner energy resources. Indiana AEE strongly supports the introduction of utility offerings, often referred to as 'renewable energy' or 'green' tariffs, by Duke Indiana and other utilities in the state in future filings before the Commission.

Based on lessons learned from other states, Indiana AEE recommends the following six steps to meet the economic and environmental requirements for utility-delivered renewable energy production options and the renewable energy needs of companies in Indiana:

1. Seek advice and input from customers, industry, and other states, including nearby states such as Michigan, Kentucky, and Missouri that are among the 15 states that have developed utility renewable energy programs;
2. Determine which approaches align best with state and utility circumstances, taking into account how existing utility rates are structured, the presence or absence of an organized wholesale market, load growth and system resource needs, and the cost-effectiveness of various renewable energy sources;
3. Account for the varying needs of different customers, including nonparticipants, acknowledging that there is no one-size-fits-all solution for every customer and ensuring that the program is fair, transparent, and cost-based to protect both participating and non-participating customers;
4. Adopt replicable best practices, as described in detail below;

[11] *See Commercial and Industrial Renewable Energy Demand: Geographic Focus on Indiana.* Aaron Barr. December, 2019. Advanced Energy Economy and Wood Mackenzie.

5. Guide customers through the decision and enrollment process to ensure that customers have all the data and information they need to make informed decisions; and
6. Review, iterate, and improve by providing annual updates to regulators, soliciting feedback from customers, and making improvements as needed.

These six steps allow a utility to take into account the specific circumstances of its service territory while applying universally applicable best practices and lessons learned. By following these recommendations, each utility will arrive at a slightly different answer—but whatever the final solution, these steps are intended to ensure that the utility can meet corporate and industrial (C&I) customers' renewable energy needs and preferences while maximizing the benefits to all customers.

As mentioned above, Indiana AEE has reviewed and engaged with numerous renewable energy tariff offerings across the United States. We have developed a series of best practices and recommend the following:

1. Select the most appropriate rate design from the several models available, taking into account existing rate structures and customer needs;
2. Start with an initial offering large enough to enable commercial and industrial customers to make meaningful progress towards their renewable energy goals while including a clear mechanism for expanding the program;
3. Ensure that all commercial and industrial customers are eligible to participate in at least one program;
4. Rely on competitive procurements to select resources and meet program needs while giving customers the option to source projects directly;
5. Give customers a range of term options, including mid-range (10-15 years);
6. Transfer RECs to customers or retire them on the customer's behalf;
7. Adopt reasonable and cost-based administrative fees; and
8. Include clean, fair and flexible termination provisions that allow for transfers to different accounts.

3. Indiana AEE supports more use of demand-side resources as the most cost-effective energy option for Indiana ratepayers.

While Indiana AEE strongly supports more investment in wind, solar, and batteries, we acknowledge that demand side resources are still the most cost-effective energy option for Indiana ratepayers. Indiana AEE believes that the proposed IRP underestimates this potential.

A suite of demand side resources offers better use of existing resources, improved reliability, and avoided need for potentially unnecessary investments in generation resources. Right now, energy efficiency is the most cost-effective way to meet energy demand. As Duke Indiana predicts little annual energy demand increases, energy efficiency can significantly reduce the need for new generation that directly substitutes, megawatt for megawatt, its retiring capacity. Indiana AEE supports Duke Indiana's past work with the IURC to establish programs that include free and discounted light bulbs, home energy audits, Smart $aver, Power Manager and appliance recycling. Still, Indiana AEE argues that Duke Indiana can invest in many more megawatts of savings beyond the 250MW included in their preferred portfolio by expanding the standard suite of programs that can serve as grid resources and including meter-based pay-for-performance procurements. Even in Duke Indiana's Aggressive Transition and Rapid Decarbonization portfolios, energy efficiency represents an underutilized resource.

Passive peak impacts from energy efficiency programs can be particularly substantial. Even without programs designed to target savings at particular times of day, a recent study from the Lawrence Berkeley National Lab estimates that the savings-weighted Program Administrator Cost of Saving Peak Demand (PA CSPD) averages $1,483/kilowatt (kW) and varies more than four-fold ($568/kW to $2,353/kW) depending on the program type.[12] Meter-based pay-for-performance program designs, particularly when enabled by advanced metering infrastructure, can provide direct incentives at and track the outcomes from the time value of the interventions, with impacts that could be significantly increased. Numerous positive outcomes are enabled by using the time-sensitive value of efficiency but most importantly identifying the optimal amount of energy efficiency for a reliable electricity system at least cost (e.g., reduced reserve margins and system revenue requirements).[13]

Duke Indiana plans for only 185 MW of demand response capacity in its preferred portfolio, aggressive transition and rapid decarbonization portfolios. Though Duke Indiana already has well-developed commercial and industrial demand response resources, there is significant room for improvement. The economic potential for demand response comes primarily from the avoided costs of expensive system upgrades and generation capacity development needed to meet peak load. AEE issued a report in February 2018 that showed that day ahead commercial and industrial demand response programs could create up $485 million in a medium avoided cost scenario to $1.6 billion in a high avoided cost scenario in net benefits over the next 10 years.[14]

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[12] *Peak Demand Impacts From Electricity Efficiency Programs.* Frick et al. 2019.
[13] *Time-Sensitive Value of Efficiency: Use Cases in Electricity Sector Planning and Programs.* Frick, Natalie Mims, and Lisa C Schwartz. 2019.
[14] *Potential for Peak Demand Reduction in Indiana*. Prepared for Indiana Advanced Energy Economy by Demand Side Analytics, LLC. February 2018.

For residential demand response, the potential lies within the ability of a utility to scale down air conditioning and water heater use when energy demand is especially high. Approximately 85% of Indiana residents have central air conditioning, and use of central air conditioning accounts for over 20% of peak load. Only 1.5% of Indiana households currently have connected thermostats. Duke Indiana has an existing residential demand response program with approximately 54,000 participants who together represent a load reduction capacity of 61MW. Over the 20 year planning horizon, connected thermostats will become commonplace and more customers can be incentivized to take advantage of these programs. Significant savings exist if Duke Indiana ramps up this program to reach 214,000 enrollees and 230 MW (approximately 30% of its residential customers): AEE estimates that over 10 years, the net benefits, which factor in the costs associated with the widespread adoption of connected thermostats, are predicted to be $73 million in a medium avoided cost scenario or $344 million in a high avoided cost scenario.[15]

Additionally, programs that shave peak loads or shift demand to off-peak hours have proven to be a low cost strategy to save electric ratepayers money. Indeed, AEE's February 2018 report showed that pursuing cost-effective peak demand reduction strategies along with energy storage would produce net benefits for electric ratepayers (total savings minus costs) ranging from $448 million to $2.3 billion over 10 years.[16]

4. Proposals to invest in combined cycle gas plants, particularly in 2030 and beyond, should be scrutinized closely against more cost-effective advanced energy resources.

Indiana AEE is concerned about the cost-effectiveness of Duke Indiana's proposal to build new combined cycle gas power plants in 2030 and 2034. While we recognize that capacity must be added to Duke Indiana's portfolio to compensate for the loss of retiring traditional power plants, there are more cost-effective alternatives, which help to avoid the potential economic risk towards ratepayers that large scale gas plants turn into stranded assets over the long-run. There is already precedent in Indiana to reject investment decisions that rely on large-scale investments when more cost-effective alternatives exist in the market. In the Indiana Utility Regulatory Commission's decision to reject Vectren's recent proposal to replace coal generation with an 850 MW combined cycle natural gas plan, the Commission cited avoidable financial risk to consumers and a rapidly changing technological landscape:

> ...We conclude that Vectren South's risk analysis does not adequately consider the relative risk of other methods for providing reliable, efficient, and economical electric service. The proposed large scale single resource investment for a utility of Vectren South's size does not present an outcome which reasonably minimizes the potential risk

[15] *Id.*
[16] *Id.*

> that customers could sometime in the future be saddled with an uneconomic investment or serve to foster utility and customer flexibility in an environment of rapid technological innovation.[17]

The Commission then directed Vectren to consider combinations of less expensive advanced energy alternatives. Indiana AEE supports the Commission's caution in approving new traditional generation resources and agrees that significant cost saving opportunity exists in a varied portfolio that relies on a mix of wind, solar, energy storage, and demand-side resources. The Commission should similarly consider advanced energy alternatives when reviewing Duke Indiana's plans for new combined cycle gas plant investments.

Lastly, Indiana AEE appreciates Duke Indiana's acknowledgement of its need to be flexible throughout the 20 year horizon of this IRP. Duke Indiana will need to react to new technologies and new state and federal regulations. Still, Indiana AEE believes that even now the most cost-effective, reliable and flexible approach includes more deployment of renewable resources, battery storage, energy efficiency and demand response. By recognizing the potential of these technologies in the short-term, Duke Indiana may be able to take costly peaking generation plants offline sooner and avoid expensive investments in soon-to-be obsolete infrastructure, benefitting the ratepayers and the burgeoning advanced energy industry within the state.

Respectfully submitted,

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[17] *Indiana Utility Regulatory Commission Cause No. 45052*. April 24, 2019. Page 28.