Duke Energy Indiana, LLC
1000 East Main Street
Plainfield, IN 46168

KELLEY A. KARN
Deputy General Counsel
T: (317) 838-2461
F: (317) 838-1842
kelley.karn@duke-energy.com

VIA EMAIL

February 21, 2020

Attn: Ryan Heater
Indiana Utility Regulatory Commission
101 W. Washington Street, Suite 1500 E
Indianapolis, IN 46204

Dear Ryan:

Please find attached some comments and questions regarding the documents provided by the Indiana Utility Regulatory Commission ("Commission") regarding its study of the statewide impacts of transitions in fuel sources and other electric generation resources, as well as the impacts of new and emerging technologies on electric generation and distribution infrastructure, electric generation capacity, system reliability, system resilience, and the cost of electric utility service for consumers.

Duke Energy Indiana appreciates the chance to provide input, has cooperated with requests for data and looks forward to continuing to review interim and final reports. Please let me know if you have any questions.

Sincerely,

Kelley A. Karn
Deputy General Counsel
Duke Energy

656172

Duke Energy Indiana Comments on House Enrolled Act 1278 (2019) IURC Study Plans

Recommendations on terminology:

- Scenarios are an internally consistent sets of assumptions outside the utility's control, such as gas prices or the cost of solar. Scenarios provide a view of a possible future.
- Portfolios are different sets of resources such as build a natural gas combined cycle or a solar facility.
- Sensitivities usually start with a base scenario (a view of the future) and test that future through changes to one or several individual assumptions (i.e., high gas prices, low load)

Overall recommendations:

- Robustness of the analysis should incorporate all the interrelationships between variables when one variable changes. Changing only one assumption does not adequately capture full system impacts of the variable. (See table and example in Appendix)
- Indiana should not be modeled in a vacuum. Changes to assumptions will affect market energy costs.

State Utility Forecasting Group (SUFG) Modeling recommendations and questions:

- We assume the modeling will utilize much of the same methodology as the historical SUFG Indiana Forecast Updates.
- Most scenarios appear to be single variable changes from the reference case and therefore are more accurately characterized as sensitives, rather than scenarios.
- High gas scenario – No cost trajectory over time was provided. Suggest gas price starts at $5/mmBtu that increases linearly to $10/mmBtu by the end of the planning period.
- Recommend mid and low gas cost sensitivities based on the Energy Information Administration's (EIA) Annual Energy Outlook (AEO) low gas supply and high supply cost data respectively.
- High energy efficiency (EE) scenario – Indiana investor utilities' energy efficiency market potential studies should be taken into account, as penetration increases, there are diminishing returns. Recommend a cost increase of 50% over reference case for additional EE.
- Distributed resources scenario – Will the resources provided by LBNL be fixed into the reference resource plan and through expansion modeling the remaining resources be determined?
- High Cogen scenario – Recommend a decrease in industrial load case for this.
- Carbon tax sensitivity - Recommend using Indiana utilities' Integrated Resource Plans (IRPs) as guide for a carbon tax cost and implementation year. This will have a significant impact on the market energy price.

Lawrence Berkley National Lab (LBNL) Modeling recommendations and questions:

- It is assumed all distributed energy resources are customer owned, if this is not the case, please clarify.
- High photovoltaic (PV) and storage breakthrough scenarios – Provide more detail as customer adoption magnitudes are unclear from an energy and load modifying demand side resource perspective. Please provide citations to referenced IPL IRP scenario for PV.
- Electric Vehicles – Please provide citations to referenced MISO study scenario.

Duke Energy Indiana Comments Appendix

Scenario Correlated Variables

- Variables in the electric markets impact other variables to arrive at a new equilibrium
- Robust scenario planning needs to consider these impacts and market responses
- The table below is meant to demonstrate how a change in the variables on the vertical axis impacts the variables on the horizontal axis
- It should be noted that these impacts have multiple iterations in settling to a new equilibrium (See Example)

		RESULTING CHANGE							
		Reserve Margin	Power Prices	CO2 Reg	Gas Prices	Coal Prices	Cost of Renewables	Renewable Penetration	Coal Generation
INITIAL CHANGE	Reserve Margin	0	-	0	0	0	0	0	0
	Power Prices	0	0	0	0	0	0	+	+
	CO2 Reg	0	+	0	+/-	-	0	+	-
	Gas Prices	0	+	0	0	+	0	+	+
	Coal Prices	0	+	0	+	0	0	+	-
	Cost of Renewables	0	-	+	+	0	0	-	0
	Renewable Penetration	+	-	-	-	0	+/-	0	-
	Coal Generation	0	-	0	-	+	0	0	0

EXAMPLE
1) Gas Prices increase which increases power prices
2) Coal Generation increases in response to higher power prices
3) Renewable Penetration increases in response to higher power prices
4) Renewable penetration increases
5) Higher Renewable Pentration decreases Power Prices
6) Steps 2-6 repeat, possibly multiple times, in an opposite direction and repeats again settling to a new equilibrium