Cause No. 46038

On Behalf of Petitioner,
DUKE ENERGY INDIANA, LLC

VERIFIED DIRECT TESTIMONY OF BICKEY RIMAL

Petitioner's Exhibit 8

April 4, 2024

DIRECT TESTIMONY OF BICKEY RIMAL
ASSISTANT VICE PRESIDENT
CONCENTRIC ENERGY ADVISORS, INC.
ON BEHALF OF DUKE ENERGY INDIANA, LLC
BEFORE THE INDIANA UTILITY REGULATORY COMMISSION

I. INTRODUCTIONS AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME, AND BUSINESS ADDRESS.

A. My name is Bickey Rimal and my business address is 1300 19th Street, Suite 620, Washington, DC 20036.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am employed by Concentric Energy Advisors, Inc. ("Concentric") as an Assistant Vice President.

Q. PLEASE DESCRIBE YOUR PROFESSIONAL BACKGROUND AND EDUCATION.

A. I have over 13 years of experience in the utility industry. I hold a Bachelor of Arts degree from Colgate University. I hold a Master's in International Public Affairs with a focus on Energy Policy from the University of Wisconsin in Madison. I have provided expert testimony on cost allocation issues on multiple occasions for various electric, gas, water, and wastewater utility clients. A summary of my education and experience is provided as Attachment 8-A (BR).

Q. HAVE YOU PRESENTED EXPERT TESTIMONY IN OTHER PROCEEDINGS?

A. Yes. I have testified before the Indiana Utility Regulatory Commission ("IURC" or the "Commission"). In addition to the IURC, I have testified previously before the Arizona Corporation Commission, Connecticut Public Utilities Regulatory Authority, Maine

Public Utilities Commission, Massachusetts Department of Public Utilities, New York State Department of Public Service, and Nova Scotia Utility and Review Board.

Q. ON WHOSE BEHALF ARE YOU SUBMITTING THIS DIRECT TESTIMONY?

A. I am testifying on behalf of Duke Energy Indiana ("Duke Energy Indiana" or "Company").

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to discuss the special studies that I have conducted to: 1) sub-functionalize certain distribution assets (i.e., poles and conductors) as being related either to the primary distribution system or secondary distribution system; and 2) classify these assets as being either related to customer or demand. The results of my studies are used in the retail cost of service study sponsored by Company witness Ms. Diaz.

Q. ARE YOU SPONSORING ANY ATTACHMENTS?

A. Yes. I am sponsoring the following attachments.

Table 1: Listing of Attachments

Attachment	Name
Attachment 8-A (BR)	Resume
Attachment 8-B (BR)	Primary Secondary Results
Attachment 8-C (BR)	Minimum System Results

Q. ARE YOU ALSO SUBMITTING WORKPAPERS?

A. Yes. I am submitting the following workpapers:

Table 2: Listing of Workpapers

Workpapers	Name
Workpaper 1-BR	Pole Analysis
Workpaper 2-BR	Primary Overhead Analysis
Workpaper 3-BR	Secondary Overhead Analysis
Workpaper 4-BR	Primary Underground Analysis
Workpaper 5-BR	Secondary Underground Analysis

Q. WERE THE ATTACHMENTS AND WORKPAPERS THAT YOU ARE SPONSORING PREPARED OR ASSEMBLED BY YOU OR UNDER YOUR DIRECTION AND SUPERVISION?

A. Yes.

II. PRIMARY-SECONDARY SUB-FUNCTIONALIZATION

Q. PLEASE EXPLAIN THE PRIMARY-SECONDARY STUDY.

A. Since the costs associated with distribution facilities are not specifically identified in the financial accounting records as being Primary Distribution (480 V – 34.5 kV) or Secondary Distribution (< 480 V), the distribution costs in Accounts 364–367 have been assigned to Primary or Secondary distribution functions based on cost-related ratios that were developed from analyses of the distribution plant records.

Q. HOW DID YOU CONDUCT THE PRIMARY-SECONDARY STUDY?

A. Distribution poles were functionalized between primary and secondary voltages based on the relative cost of replacing all primary poles versus secondary poles. Using the information contained in Duke Energy Indiana's Geographic Information System ("GIS"), the number of poles carrying primary versus secondary voltage by height and class was obtained. For each category of pole, the pole count was multiplied by the replacement cost of that pole type to obtain the total replacement cost of that pole type. Using the total costs of all poles by voltage, the ratio of primary poles to secondary poles was calculated. The results of this analysis are provided on Attachment 8-B (BR) and the workpapers supporting the calculations are provided on Workpaper 1-BR.

Distribution conductors were functionalized between primary and secondary voltages by utilizing length of conductors and replacement costs of conductors serving primary versus secondary distribution systems. Using Duke Energy Indiana's GIS, the length of conductors carrying primary versus secondary voltage by conductor size, material, and configuration was obtained. For each conductor type, the length of the conductor was multiplied by the replacement cost of that conductor to obtain the total cost of that conductor type. Using the total costs of all conductors by voltage, the ratio of primary conductors to secondary conductors was calculated. The results of this analysis are also provided on Attachment 8-B (BR) and the workpapers supporting the calculations are provided on Workpapers 2-BR to 5-BR.

III. MINIMUM SYSTEM STUDY

Q. ARE THE COSTS OF CERTAIN DISTRIBUTION ASSETS (DISTRIBUTION POLES, CONDUCTORS, AND CONDUITS) RELATED TO BOTH CUSTOMER AND DEMAND?

A. Yes. Distribution system costs are incurred to move electricity from generation and transmission facilities to individual customers that are distributed geographically throughout Duke Energy Indiana's service territory. A significant portion of those costs are incurred regardless of the peak demand of the customers. Increases or decreases in demand do not result in proportionate increases or decreases in the number of poles and miles of conductors and conduits required to distribute electricity geographically. For example, if the load of customers in Duke Energy Indiana's service territory was significantly reduced, but the number of customers was unchanged, we would not expect the number of poles and miles of wires in the service territory to decrease by the same proportion. The reason we classify a portion of the distribution system costs as customer-related is that the distribution system exists to deliver electricity to hundreds of thousands of customers who are widely spread throughout the Company's service territory.

Q. IS THE CLASSIFICATION OF CERTAIN DISTRIBUTION PLANT AS CUSTOMER-RELATED A RECOGNIZED ELECTRIC UTILITY PRACTICE?

A. Yes. The National Association of Regulatory Utility Commissioners ("NARUC") Manual dedicates an entire chapter to the classification and allocation of distribution plant.[1] As a part of that chapter, the NARUC Manual identifies the minimum system methodology as one of the two methods used to determine the demand-related and customer-related components of the distribution system. The NARUC Manual states:

> When the utility installs distribution plant to provide service to a customer and to meet the individual customer's peak demand requirements, the utility must classify distribution plant data separately into demand- and customer-related costs.
>
> Distribution plant Accounts 364 through 370 involve demand and customer costs. The customer component of distribution facilities is that portion of costs which varies with the number of customers. Thus, the number of poles, conductors,

[1] NARUC, Electric Utility Cost Allocation Manual, Chapter 6, at p. 83-99 (1992).

transformers, services, and meters are directly related to the number of customers on the utility's system.[2]

Q. WHAT IS THE MINIMUM SYSTEM METHOD?

A. According to the NARUC Manual, "classifying distribution plant with the minimum-size method assumes that a minimum size distribution system can be built to serve the minimum loading requirements of the customer."[3] The minimum system method compares the cost of a hypothetical minimum system (*i.e.*, a system sized to simply connect customers) to the total cost of the entire system. The minimum system cost represents the customer-related costs; whereas the total costs less the minimum system costs represent the demand-related costs (*i.e.*, total cost is split between the customer component and the demand component).

Q. DO OTHER UTILITIES CLASSIFY DISTRIBUTION COSTS ASSOCIATED WITH POLES AND CONDUCTORS AS BEING RELATED TO BOTH DEMAND AND CUSTOMER?

A. Yes. AES Indiana and Northern Indiana Public Service Company classify distribution costs associated with poles and conductors as being related to both demand and customer. They utilize the minimum system study to conduct this classification.

Q. HAS THE IURC PREVIOUSLY PROVIDED GUIDANCE REGARDING THE CLASSIFICATION OF POLES AND CONDUCTORS?

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[2] NARUC, Electric Utility Cost Allocation Manual, Chapter 6, at p. 90 (1992).
[3] NARUC, Electric Utility Cost Allocation Manual, Chapter 6, at p. 90 (1992).

A. Yes. The IURC ruled on this issue in AES Indiana's last litigated rate case in Cause 44576. The IURC stated: [4]

> For the allocation of distribution plant costs, we are not persuaded that none of the costs should be allocated based on the number of customers. The number of customers and their dispersion across a service territory create costs that can be independent of the demand of those customers. As both factors are cost drivers, and IPL has reasonably supported a reasonable delineation of the factors, we find its distribution cost allocation methodology reasonable.

Q. PLEASE EXPLAIN THE MINIMUM SYSTEM STUDY YOU CONDUCTED.

A. In order to classify a certain portion of the distribution system costs as demand-related or customer-related, I conducted a Minimum System Study for poles and conductors. The Primary and Secondary Analysis for poles described above provided the total cost and total count of primary and secondary poles. This total count of primary poles was multiplied by the replacement cost of a minimum sized primary pole currently being installed to calculate the minimum system replacement cost of primary poles. This was then compared to the total replacement cost of primary poles to determine the portion of primary poles that is customer-related and demand-related. A similar analysis was conducted for secondary poles. The results of this analysis are provided on Attachment 8-C (BR) and the workpapers supporting the calculations are provided on Workpaper 1-BR.

The Primary and Secondary Analysis for conductors described above provided the total cost and total circuit miles of primary and secondary conductors. A hypothetical minimum system replacement cost was calculated by taking the total circuit feet of conductor that related to the primary system and multiplying it by the replacement cost of

[4] *Indianapolis Power & Light*, Cause No. 44576/44602, Order (IURC March 16, 2016), at 66.

a minimum sized primary conductor currently being installed. The minimum system replacement cost was then compared to the total system replacement costs to arrive at the customer related and demand related costs for primary conductors. A similar analysis was conducted for secondary conductors. The results of this analysis are also provided on Attachment 8-C (BR) and the workpapers supporting the calculations are provided on Workpapers 2-BR to 5-BR.

Q. HOW DID YOU SELECT THE MINIMUM SIZED POLE AND CONDUCTORS FOR YOUR ANALYSIS?

A. The NARUC Manual has specific guidance regarding the methodology to conduct a MSS for specific distribution accounts (poles, overhead conductors, and underground conductors).[5] There is specific guidance regarding the selection of a minimum-sized asset. For poles, it is the "minimum height pole currently being installed". Similarly, for overhead conductors, it is the "minimum size conductor currently being installed," and for underground conductors, it is the "minimum size cable currently being installed."

Q. DOES THIS CONCLUDE YOUR PREPARED PRE-FILED TESTIMONY?

A. Yes.

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[5] NARUC, Electric Utility Cost Allocation Manual, at 91-92 (1992).

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VERIFICATION

I hereby verify under the penalties of perjury that the foregoing representations are true to the best of my knowledge, information and belief.

Signed: ______________________ Dated: April 4, 2024
Bickey Rimal

BICKEY RIMAL

Assistant Vice President

Bickey Rimal has over 13 years of progressive experience in the energy and environmental sector. Mr. Rimal has contributed to projects involving revenue requirement, cost of service, rate design, expert testimony preparation, energy market assessments, and utility performance benchmarking. His work often involves financial modeling, statistical analysis, and regulatory research. Mr. Rimal has provided expert testimony on cost allocation issues on multiple occasions. Mr. Rimal has extensively used Concentric's Excel-based macro-driven Allocated Class Cost-of-Service ("ACCOS") model for various electric, gas, and water utility clients. He has modified and updated the model as needed to suit the specific needs of the clients. Mr. Rimal has a Masters in International Public Affairs with a focus on Energy Policy from the University of Wisconsin in Madison. Prior to enrolling in the graduate program, Mr. Rimal worked at ICF International, a global energy and environmental consulting firm, for three years. At ICF, Mr. Rimal was extensively involved in projects dealing with policy design and implementation, economic impact analysis, regulatory evaluation, and environmental risk assessment.

REPRESENTATIVE PROJECT EXPERIENCE

Regulatory Proceedings and Litigation Support

Mr. Rimal has been involved in projects dealing with all aspects of regulatory ratemaking process. Mr. Rimal has extensively used Concentric's excel-based macro driven Allocated Class Cost-of-Service ("ACCOS") model for various utility clients and provided testimony supporting ACCOS studies. He has modified and updated the model as needed to suit the specific needs of the clients.

Representative engagements have included:

- Conducted ACCOS studies and designed rates for a north-eastern gas distribution company and filed testimony supporting those studies.
- Conducted ACCOS studies and designed rates for multiple water districts for a south-western water utility and filed testimony supporting those studies.
- Conducted various cost allocation studies, functional studies, and minimum system studies and filed testimony supporting those studies for a vertically integrated Midwest electric utility.
- Supported the development of an allocated class cost of service study and rate design for another vertically integrated Midwest electric utility. Mr. Rimal was directly involved in conducting special cost allocations and functional studies; developing cost of service studies; designing the rates and calculating the associated bill impacts.
- Supported the development of an allocated class cost of service study and rate design for a distribution only electric utility in Pennsylvania. Mr. Rimal modified Concentric's ACCOS model to incorporate three distinct test years simultaneously and automated the results creation process.
- Responsible for the development of various cost allocation studies for two electric utilities in New York as part of the cost of service study.
- Supported the developed revenue requirement model to comply with a new performance based formula ratemaking process for a Midwest electric utility.

- Supported cash working capital studies on multiple cases by conducting billing lag analysis involving extremely large data sets utilizing SPSS and R software.
- Created model in R to statistically compare hourly load data between two distinct types of meters to assist a utility in its load research program.
- Created an excel based benchmarking model that have been used on multiple occasions to assess performance of several utilities against various peer groups.
- Supported the development of a rate model to calculate the annual cost of service rates as well as a levelized rate for conversion of an oil pipeline into a natural gas pipeline.

Market Assessment and Asset Optimization Review

- Involved on projects, with two different gas utilities in the Northwest, that forecasted the evolution of demand for compressed natural gas and liquefied natural gas in the transportation sector in their respective territories. Mr. Rimal developed models to analyze the market penetration of different transportation fuels under various fuel price spread scenarios and other market dynamics.
- Estimated the impact on electricity prices due to pre-mature closure of certain nuclear facilities using regression analysis. Validated the price impacts by analyzing the generation supply curve for the location in question.
- Annual assessment of asset manager's performance on multiple occasions by conducting asset optimization analysis of client's natural gas portfolio consisting of both transportation and storage assets.

Valuation

- Created a Discounted Cash Flow ("DCF") model to value a generic regulated natural gas local distribution company ("LDC"). The model was customized to create valuation for any LDC covered by SNL Financial by automating the data retrieval process from SNL based on user input. The model had an added functionality of triggering a revenue enhancement when the earned ROE was outside certain pre-established thresholds.
- Created Discounted Cash Flow ("DCF") models to assess the profitability of various generic units operating in the New York Control Area for NYISO.

Capacity Price Forecasting

- Updated and modified Concentric's Capacity model used to forecast capacity prices for various regions within NYISO based on existing and planned generation, planned retirements, transmission constraints, market mitigation rules, gross and net CONE estimates, and other relevant demand curve parameters.

Relevant ICF Experience

- While at ICF, Mr. Rimal was part of a team that assisted the EPA's Clean Air Market Division (CAMD) in analyzing the effect of environmental policies on power generation sector. As a part of this effort, he was significantly involved in executing as well as maintaining and updating the Technology Retrofit and Updating Model (TRUM). The TRUM model simulates the action of the electric utilities industry under a multi-pollutant emissions trading program.

- Assisted in the creation of an excel model that assessed the impacts of GHG mitigation policies on the competitiveness of the US manufacturing industries.
- Provided support to the Hours of Service regulation by analyzing different crash related data to identify main causes of fatigue among drivers by utilizing logistic regression models.

PROFESSIONAL HISTORY

Concentric Energy Advisors, Inc. (2011 – Present)
Assistant Vice President
Senior Project Manager
Project Manager
Senior Consultant
Consultant
Assistant Consultant
Associate

ICF International (2006 – 2009)
Associate
Analyst
Research Assistant

EDUCATION

University of Wisconsin – Madison
M.A., International Public Affairs, 2011

Colgate University
B.A., Chemistry, Colgate University, 2006

ARTICLES AND PUBLICATIONS

Nemet Gregory F., Braden Peter, Cubero Ed, Rimal Bickey. Four decades of multiyear targets in energy policy: aspirations or credible commitments? WIREs Energy Environ. 2014, 3: 522-533.

AVAILABLE UPON REQUEST

Extensive client and project references, and specific references.

SPONSOR	DATE	CASE/APPLICANT	DOCKET	SUBJECT
Arizona Corporation Commission				
Epcor Water Arizona Inc.	2020	Epcor Water Arizona Inc.	Docket No. WS-01303A-20-0177	Embedded Cost of Service and Rate Design; Weather Normalization Adjustment
Epcor Water Arizona Inc.	2022	Epcor Water Arizona Inc.	Docket No. WS-01303A-22-0236, et al.	Embedded Cost of Service and Rate Design
Connecticut Public Utilities Regulatory Authority				
The Connecticut Water Company	2021	The Connecticut Water Company	Docket No. 20-12-30	Allocated Cost of Service, Rate Design and Rate Consolidation
The United Illuminating Company	2022	The United Illuminating Company	Docket No. 22-08-08	Allocated Cost of Service and Rate Design
Connecticut Natural Gas Corporation and The Southern Connecticut Gas Company	2023	Connecticut Natural Gas Corporation and The Southern Connecticut Gas Company	Docket No, 23-11-02	Allocated Cost of Service and Rate Design
Indiana Utility Regulatory Commission				
Northern Indiana Public Service Co.	2015	Northern Indiana Public Service Co.	Cause No. 44688	Cost Allocation
Northern Indiana Public Service Co.	2018	Northern Indiana Public Service Co.	Cause No. 45159	Cost Allocation
AES Indiana	2019	AES Indiana	Cause No. 45211	Cost Allocation as it relates to a Special Contract
AES Indiana	2023	AES Indiana	Cause No. 45911	Embedded Cost of Service and Rate Design
Maine Public Utilities Commission				
Central Maine Power Company	2022	Central Main Power Company	Docket No. 2022-00152	Embedded Cost of Service Study
Massachusetts Department of Public Utilities				
Boston Gas Company d/b/a National Grid	2020	Boston Gas Company d/b/a National Grid	DPU 20-120	Embedded Cost of Service and Rate Design

SPONSOR	DATE	CASE/APPLICANT	DOCKET	SUBJECT
New York State Department of Public Service				
New York State Electric & Gas Corporation, and Rochester Gas and Electric Corporation	2022	New York State Electric & Gas Corporation, and Rochester Gas and Electric Corporation	Case 22-E-0317	Embedded Cost of Service and Rate Design
National Fuel Gas Distribution Corporation	2023	National Fuel Gas Distribution Corporation	Case 23-G-0627	Embedded Cost of Service

Line No.	Description	Primary	Secondary	Total
1	Poles	$ 722,569,607	$ 131,607,109	$ 854,176,716
2	OH Conductors	787,395,789	117,304,789	904,700,578
3	UG Conductors	487,664,974	144,861,610	632,526,585
4	Total	$ 1,997,630,370	$ 393,773,508	$ 2,391,403,878
5	Poles	**84.59%**	**15.41%**	**100.00%**
6	OH Conductors	**87.03%**	**12.97%**	**100.00%**
7	UG Conductors	**77.10%**	**22.90%**	**100.00%**

Pole Analysis - Primary Secondary Split

Line No.		**Primary**	**Secondary**	**Primary and Secondary**	**Total**
1	Cost ($)	$ 425,234,450	$ 113,829,792	$ 315,112,474	$ 854,176,716
2	Number of Poles	249,243	128,191	179,627	557,061
3	Secondary Incremental Cost			$ 17,777,317	
4	Allocation to Primary	100%		94%	
5	Allocation to Secondary		100%	6%	
6	Total Cost ($)	$ 722,569,607	$ 131,607,109		$ 854,176,716
7	Total Count (# of Poles)	418,736	138,325		557,061

Line No.			
1	**Overhead Conductors**		
2	Primary Replacement Costs	$	787,395,789
3	Secondary Replacement Costs	$	117,304,789
4	**Underground Conductors**		
5	Primary Replacement Costs	$	487,664,974
6	Secondary Replacement Costs	$	144,861,610

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Line No.	Description	Customer	Demand	Total
	Primary			
1	Poles	$ 575,586,409	$ 146,983,198	$ 722,569,607
2	OH Conductors	454,448,290	332,947,499	787,395,789
3	UG Conductors	372,175,072	115,489,902	487,664,974
4	Total Primary	$ 1,402,209,771	$ 595,420,599	$ 1,997,630,370
5	**Percentage**	**70.19%**	**29.81%**	**100.00%**
	Secondary			
6	Poles	108,702,542	22,904,566	131,607,109
7	OH Conductors	83,883,691	33,421,098	117,304,789
8	UG Conductors	110,391,067	34,470,543	144,861,610
9	Total Secondary	$ 302,977,300	$ 90,796,208	$ 393,773,508
10	**Percentage**	**76.94%**	**23.06%**	**100.00%**

		Customer	Demand	Total
11	**OH Line Primary**	**68.22%**	**31.78%**	**100.00%**
12	**UG Primary**	**76.32%**	**23.68%**	**100.00%**
13	**Total Primary**	**70.19%**	**29.81%**	**100.00%**
14	**OH Line Secondary**	**77.37%**	**22.63%**	**100.00%**
15	**UG Secondary**	**76.20%**	**23.80%**	**100.00%**
16	**Total Secondary**	**76.94%**	**23.06%**	**100.00%**

Line No.	Primary Poles		
1	Primary Poles (# of poles)		418,736
2	Minimum Cost - Primary Pole (40 Foot Pole)	$	1,375
3	Minimum Cost to Provide Primary (line 1 * line 2)	$	575,586,409
4	Total Replacement Cost - Primary Poles	$	722,569,607
5	**Secondary Poles**		
6	Secondary Poles (# of poles)		138,325
7	Minimum Cost - Seconday Pole (35 Foot Pole)	$	786
8	Minimum Cost to Provide Secondary (line 8 * line 9)	$	108,702,542
9	Total Replacement Cost - Secondary Poles	$	131,607,109

Duke Energy Indiana, LLC
Minimum System Study Results

Line No.			
1	**Primary Overhead Conductors**		
2	Total Circuit Miles of Primary Conductor - OH		16,043
3	Minimum Cost Per Mile - OH (WIRE 2 AAAC AL and Neutral)	$	28,327
4	Total Minimum Cost - OH (line 2 * line 3)	$	454,448,290
5	Total Replacement Cost - Primary OH	$	787,395,789
6	**Primary Underground Conductors**		
7	Total Circuit Miles of Primary Conductor - UG		6,990
8	Minimum Cost Per Mile - UG (Cable 1/0 AL)	$	53,245
9	Total Minimum Cost - UG (line 9 * line 10)	$	372,175,072
10	Total Replacement Cost - Primary UG	$	487,664,974
11	**Secondary Overhead Conductors**		
12	Total Circuit Miles of Secondary Conductor - OH		6,094
13	Minimum Cost Per Foot - OH (#6 AL DUPLEX)	$	13,765
14	Total Minimum Cost - OH (line 16 * line 17)	$	83,883,691
15	Total Replacement Cost - Secondary OH	$	117,304,789
16	**Secondary Underground Conductors**		
17	Total Circuit Miles of Secondary Conductor - UG		3,066
18	Minimum Cost Per Mile - UG (#6 AL DUPLEX)	$	36,006
19	Total Minimum Cost - UG (line 23 * line 24)	$	110,391,067
20	Total Replacement Cost - Secondary UG	$	144,861,610