SOUTHERN INDIANA GAS AND ELECTRIC COMPA

D/B/A

VECTREN ENERGY DELIVERY OF INDIANA, INC.

CAUSE NO. 45052

VERIFIED DIRECT TESTIMONY

OF

RINA H. HARRIS

DIRECTOR, ENERGY EFFICIENCY

SPONSORING PETITIONER'S EXHIBIT NO. 8,
ATTACHMENTS RHH-1 THROUGH RHH-2

VERIFIED DIRECT TESTIMONY

OF

RINA H. HARRIS

DIRECTOR, ENERGY EFFICIENCY

Q. Please state your name and business address.

A. My name is Rina H. Harris, and my business address is One Vectren Square, Evansville, Indiana 47708.

Q. By whom are you employed and in what capacity?

A. I am employed by Vectren Utility Holdings, Inc. ("VUHI"), the immediate parent company of Southern Indiana Gas and Electric Company d/b/a Vectren Energy Delivery of Indiana, Inc. ("Vectren South" or "Company"), Indiana Gas Company, Inc. d/b/a Vectren Energy Delivery of Indiana, Inc. ("Vectren North") and Vectren Energy Delivery of Ohio, Inc. ("VEDO"). Vectren South has both a gas division and an electric division. I am the Director of Energy Efficiency for VUHI.

Q. What is your educational background?

A. I received a Bachelor of Science degree in Public Affairs from Indiana University in 2005. I also received a Master of Science degree in Public Affairs from Indiana University in 2007.

Q. What is your business experience?

A. I have been employed by VUHI since 2008 in a variety of positions. Previously, I was the Manager of Gas Conservation and DSM, with responsibility for the management of all aspects of the gas conservation portfolio for all three VUHI regulated utilities and oversight over all evaluation and planning activities. Prior to that, I was the Supervisor of

Demand Side Management Evaluation and Planning. As part of my role as Supervisor of DSM Evaluation and Planning, I was responsible for the management of all electric and gas evaluation activities, program planning, and conservation-related market research. Prior to that, I was Senior Conservation Analyst with responsibilities over conservation market research and program satisfaction, benchmarking conservation best practices and evaluation. I have also worked in market research as an analyst, with a focus on conservation initiatives related to demographic analysis, segmentation, and targeted marketing.

Q. What are your present duties and responsibilities as Director of Energy Efficiency?

A. As Director of Energy Efficiency, I am responsible for managing all aspects of electric and gas energy efficiency ("EE") and demand response ("DR") programs, including the Direct Load Control ("DLC") program, for the three VUHI utilities. In this position, I oversee all aspects of implementation, planning, marketing, evaluation and reporting of the EE and DR Programs.

Q. Have you previously testified before the Indiana Utility Regulatory Commission ("Commission")?

A. Yes. Most recently, I testified Cause No. 44927, where Vectren South sought approval of its 2018-2020 Energy Efficiency Plan ("2018-2020 Plan"). I have also testified in Vectren South's Cause No. 44645 remand case, where Vectren South is seeking approval to recover lost revenues associated with the Vectren South 2016-2017 Electric DSM Plan ("2016-2017 Plan"). Additionally, I testified in Cause No. 43405 DSMA 15, which is Vectren South's Demand Side Management Adjustment ("DSMA") proceeding, where Vectren South sought approval to recover costs associated with customer participation

in Company sponsored EE and DR (including DLC) programs and lost revenues resulting from implementation of approved programs. In addition, I testified in Cause No. 44598, where Vectren North and Vectren South, collectively, sought approval for its Indiana gas energy efficiency programs, including integrated gas and electric programs.

Q. Are you sponsoring any exhibits in support of your testimony?

A. Yes. I am sponsoring the following exhibits:

- Petitioner's Exhibit No. 8, Attachment RHH-1, the Vectren South 2015-2019 Market Potential Study ("MPS");
- Petitioner's Exhibit No. 8, Attachment RHH-2, the Vectren South Electric updated cost projection and assumptions for EE modeling.

Q. Were the exhibits identified above prepared or assembled by you or under your direction or supervision?

A. Yes. It is important to recognize, however, that other Vectren South employees and consultants were involved in the process of developing these exhibits. I served the role of overseeing the development.

Q. What is the purpose of your Direct Testimony in this proceeding?

A. My testimony describes how part of the Company's load obligation is met through Conservation and Demand Side Management ("DSM") initiatives (*e.g.* EE and DR). I explain that Vectren South has significant experience implementing EE programs; the target level of EE that Vectren South's modeling has indicated is the most economic; and that Vectren South is working diligently to achieve these targets. I will describe revised EE modeling Vectren South performed for this proceeding to ensure the targeted level of EE energy savings was the most economic level for customers. Finally, I will

explain why DSM initiatives are not a realistic substitute for the combined cycle gas turbine ("CCGT") Vectren South is proposing to construct in this proceeding.

I. Vectren South DSM Initiatives

Q. Did Vectren South consider DSM as a resource in its 2016 Integrated Resource Plan ("IRP")?

A. Yes. Vectren considered EE and associated DR as a resource in its 2016 IRP. These two components are part of a balanced utility resource plan and were evaluated in the 2016 IRP.

Q. Please describe the difference between EE and DR resources.

A. EE helps to reduce energy utilized in homes and buildings and results in fewer kilowatt-hours used while DR reduces kilowatts of demand during peak hours of the day. Vectren South continues to offer a portfolio of DSM programs that helps to achieve both EE and DR savings.

Q. Please describe Vectren South's experience in offering DSM programs.

A. Vectren South first began offering electric DSM programs in 1992 through a DLC program that was designed to reduce peak demand. The DLC program has been continuously offered by Vectren South since 1995. Vectren South began expanding available DSM programs in 2010 pursuant to a Commission Order in Cause No. 43427, introducing EE programs. Vectren South has expanded and added to its DSM portfolio over the years. Pursuant to the Commission's December 28, 2017 order in Cause No. 44927, Vectren South includes 12 residential and 7 commercial and industrial ("C/I") programs in its 2018 DSM portfolio. See Table RHH-1 below for a listing of DSM programs as approved in Cause No. 44927.

Table RHH-1 2018-2020 Approved Programs

Residential Programs	C&I Programs
Residential Lighting	Commercial Prescriptive
Residential Prescriptive	Commercial Custom
Residential New Construction	Small Business Direct Install
Home Energy Assessment & Weatherization	Commercial New Construction
Income Qualified Weatherization	Building Tune-up
Food Bank - LED Bulb Distribution	Multi-Family Retrofit
Energy Efficient Schools	CVR Commercial
Residential Behavioral Savings	
Appliance Recycling	
Smart Thermostat Program (incentives)	
CVR Residential	
SmartDLC - Wifi DR/DLC Changeout	
BYOT DR Program (Bring Your Own Thermostat)	

Q. Have Vectren South's DSM programs been successful?

Yes. Vectren South has offered EE programs that have proven to be cost-effective and successful in terms of program performance, as determined through our implementation and evaluation process. Vectren South has achieved and exceeded its overall savings goal, specifically for Company managed programs, over the past 8 years. Vectren South also integrates program offerings where applicable with its gas EE programs to gain both gas and electric savings while in customer homes or businesses to maximize cost effectiveness and customer experience. Vectren South has helped customers save approximately 330,000 MWh since 2010.

II. Vectren South IRP Modeling of EE

Q. What are Vectren South's future EE plans?

A. Vectren South is committed to EE and is currently in the process of developing a Market Potential Study ("MPS") covering a six year period (2020-2025). As part of this study,

Vectren South will request market potential estimates of varying potential levels over a 20 year period and associated costs. Vectren South's updated MPS will serve a larger role in the EE modeling in its next IRP.

Q. How did Vectren South model EE as a resource in its 2016 IRP?

A. In the 2016 IRP, Vectren South allowed EE to compete on equal footing with all other supply side resources beginning in 2018. That is, no minimum level of energy efficiency was included for the planning process. This change was driven primarily by the enactment of Ind. Code § 8-1-8.5-10 ("Section 10"), which requires the IRP to determine the optimal balance of resources to meet Vectren South's energy needs.

Planning years 2016 and 2017 of the IRP planning period assumed Vectren South would achieve 1% of annual energy savings because Vectren South's approved EE plan for these years was designed to achieve this level of energy savings. The IRP made available for selection up to 2% of eligible retail sales as an EE resource option in the IRP process beginning in 2018 for the remaining 18 year planning horizon. The 2% applies to the level of retail sales after reduction for the level of load that has opted out and is consistent with the technical potential indicated in Vectren South's 2015-2019 MPS.

To facilitate the IRP resource selection process, the 2% of eligible retail sales was broken into eight blocks of 0.25% each. Taking this over the remaining 18-year horizon means that over 144 incremental blocks of 0.25% each were available to be selected in the IRP process. Each 0.25% block of EE was net of free riders.

Q. Why did the Company only allow for selection of up to 2% of eligible retail sales?

A. The Company made available for selection up to 2% of eligible retail sales as an EE resource option in the IRP process beginning in 2018 for the remaining 18 year planning horizon. The 2% applies to the level of retail sales after reduction for the level of load that has opted out and is consistent with the technical potential indicated in Vectren South's 2015-2019 MPS.

Q. What do you mean by the technical potential?

A. Technical Potential is the maximum energy efficiency available, assuming that cost and market adoption of technologies are not a barrier. It does not consider economics and customer preferences.

Q. Has Vectren South's approach generally been accepted by stakeholders?

A. Yes. The 2017 Director's IRP Report recognized Vectren South's EE modeling methodology as a reasonable approach to modeling DSM resources in a manner reasonably comparable to supply-side resources structure. The Final Report noted the Company's approach as one reasonable approach and consistent with current practices by some utilities to address this difficult topic. The report went on to recognize Vectren for improved analysis and interesting approaches to address a number of difficult issues that arise when evaluating energy efficiency programs. Furthermore, IRP stakeholders such as the Midwest Energy Efficiency Alliance ("MEEA") noted they especially liked and/or appreciated certain aspects of Vectren South's treatment of DSM.

Q. Did the 2016 IRP Base Case scenario modeling select any EE over the planning horizon?

A. EE was not selected at all over the 20-year period in its base case (even one block of .25%), primarily driven by low, stable gas costs. Alternate scenarios were evaluated with varying resource options and pricing and some of those scenarios did select some level

of EE, at 1% of eligible sales most often. Vectren South's preferred portfolio included 1% EE through 2020 and varying levels beyond, as it was determined that energy efficiency between 2018 and 2020 had a very small impact to the portfolio's NPV. Vectren South believes that offering a reasonable level of EE to our customers helps them manage their energy bills while also helping to diversify the preferred portfolio. Additionally, it aligns with the need demonstrated in its MPS. The proper level of EE to offer to customers will be evaluated every three years in subsequent IRPs.

Q. How does the level of EE planning resulting from the IRP modeling impact Vectren South's future planning?

A. Vectren South anticipates being successful in achieving energy and demand savings in the future, which helps to offset load growth and the need to serve that load with new generation.

Q. Please describe Vectren South's EE cost modeling methodology utilized in its 2016 IRP.

A. As a starting point, the cost of the energy efficiency programs approved in Cause No. 44645 was used for the 2017 EE resource option. Vectren South's expert, Dr. Richard Stevie, prepared a study that sought to develop estimates of how the cost of energy efficiency increases as penetration of energy efficiency increases. The study found that program costs per kWh increase as the cumulative penetration of energy efficiency increases. Based on the 8 years of experience Vectren South has implementing EE/DSM measures, we have found that inducing increasing numbers of customers to implement EE/DSM measures requires greater cost. While many factors influence this, a significant factor is the cost of reaching customers to influence them to adopt EE measures. We must spend more money to both reach and educate a higher number of

customers to convince them to invest in EE measures (even if subsidized by Vectren South). Dr. Stevie's research helped confirm that the Company's experience is shared by others. For purposes of Vectren South's analysis, he adopted an escalating percentage, and he incorporated a step change increase in cost between 1% and the next increment of EE savings. Dr. Stevie's analysis was based on the Energy Information Administration's ("EIA") Form 861 which contains data by utility on DSM program spending and load impacts. There are a number of limitations when using this data, which Dr. Stevie recognizes and tries to minimize by using the most recent 3 years of data, 2010 to 2012. Dr. Stevie noted that, prior to his study, little to no evidence exists on the relationship between program costs and market penetration of energy efficiency but now his research provides initial insight into this relationship. Dr. Stevie also notes that his results are at a "very high level" and there is much room for additional research. Some stakeholders disagreed with Dr. Stevie's analysis, largely driven by the issue of data credibility.

Q. Did Vectren South perform sensitivities to evaluate how sensitive modeling results are to changes in EE costs?

A. Yes. Based on Dr. Stevie's modeling results, high and low energy efficiency cost trajectories were developed using the estimated standard errors of the model coefficients used to develop the Base energy efficiency cost projection. The high and low cost trajectories were created by applying plus and minus one standard deviation to the model coefficients (which would capture about 68% of the variation of outcomes around the "expected value" – or the "mean").

Q. Did Vectren South further evaluate any aspects of the EE modeling conducted for its IRP?

A. Yes. Subsequent to the Director's Final IRP Report, Vectren South has modified the projected cost of implementing EE over the twenty year period in a manner that has the effect of reducing the cost of EE achieved over the planning period. However, the modified projection does not change the result in the IRP, where again EE was not selected. We will again model EE programs in our 2019 IRP to determine any adjustments needed for future filings and continue to evaluate the best approach through on-going discussions with our stakeholders and oversight board.

Q. Why did Vectren South revise EE pricing used in the IRP?

A. Stakeholders, including the Commission Staff[1], had raised some concerns about the methodology utilized by Vectren South for purposes of its 2016 IRP. The Company developed a different methodology for estimating the future cost of EE programing to evaluate whether these concerns would have a material impact on the resources selected—particularly the level of EE selected—over the twenty year planning period.

Q. How did Vectren South revise its EE costs in light of this concern?

A. Vectren South aligned EE costs with its latest MPS, similarly to some of the other electric Indiana utilities. Vectren South's MPS provides multiple levels of achievable potential savings and costs (low, recommended, and high achievable). We used these costs to develop new growth rates for the projection – specifically for blocks 5-8 or the second 1% of EE that could be selected as a resource. We increased the growth rate in block 5 by 9% (ties to the growth rate between low and recommended potential in MPS) and blocks 6-8 by 4.5% (ties to growth rate between recommended and high potential). The growth rate across the first four blocks (1%) and growth rate year-over-year of 4% did not change from the original model as it aligns with Vectren South's experience.

[1] Director's IRP Report 11-2-2017, page 59.

These changes provide a reasonable approach and alleviate many stakeholder concerns associated with the EE cost projection. The revised pricing is set forth in Petitioner's Exhibit No. 8, Attachment RHH-2.

Q. What effect did this revision have on the projected future costs of EE for purposes of Vectren South's twenty year planning horizon?

A. The revisions made to the EE cost projection result in lower EE costs over the 20 year planning horizon. The average reduction across all EE blocks, over 20 years, is approximately 30%.

Q. Did this change in EE modeling impact the amount of EE/DSM selected by the Strategist modeling?

A. No. Vectren South provided this revised EE cost projection to Burns & McDonnell to evaluate as part of the updated modeling used to support the relief sought in this proceeding. Vectren South witness Matthew Lind describes in more detail the Strategist modeling that was utilized. The result of modeling with the lower EE costs was that the model still found 1% of energy savings was the optimal balance for customers over the twenty year horizon.

Q. Based on your experience with EE in Vectren South's service territory, would EE be a reasonable alternative to the CCGT Vectren South seeks authority to construct?

A. No. The 2016 IRP and updated modeling demonstrate that EE will be an important part of Vectren South's resource options in the future. EE will be particularly important to help mitigate against the need to build new generation to serve incremental load, as EE will ensure that some incremental load will be satisfied through energy savings rather than new generation resources. However, Vectren South's modeling indicates that the most

economical option for customers over the long term is to replace more than 800 megawatts of its existing generation resources with a new resource. Based on the MPS conducted by Vectren South and my experience with EE initiatives in the past, Vectren South could not derive sufficient energy savings from EE to replace this generation.

III. Conclusion

Q. Does this conclude your prepared direct testimony?

A. Yes, at this time.

VERIFICATION

The undersigned, Rina H. Harris, affirms under the penalties of perjury that the answers in the foregoing Direct Testimony in Cause No. 45052 are true to the best of his knowledge, information and belief.

Rina H. Harris

Rina H. Harris