

OFFICIAL
EXHIBITS

Petitioner's Exhibit No. 2
Cause No. 44909-CECA 3
Vectren South
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SOUTHERN INDIANA GAS AND ELECTRIC COMPANY
d/b/a VECTREN ENERGY DELIVERY OF INDIANA, INC.
(VECTREN SOUTH)

IURC CAUSE NO. 44909-CECA 3

IURC
PETITIONER'S
EXHIBIT NO. 2
4-26-20 AT
DATE REPORTER

DIRECT TESTIMONY
OF
ROLAND A. ROSARIO
MARKET DEVELOPMENT MANAGER

ON

URBAN LIVING RESEARCH CENTER PROJECT
AND ROOFTOP SOLAR SYSTEM

SPONSORING PETITIONER'S EXHIBIT NO. 2

DIRECT TESTIMONY OF ROLAND A. ROSARIO

I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Roland A. Rosario. My business address is 211 NW Riverside Drive, Evansville, Indiana 47708.

Q. On whose behalf are you submitting this direct testimony?

A. I am submitting testimony on behalf of Southern Indiana Gas and Electric Company d/b/a Vectren Energy Delivery of Indiana, Inc. ("Vectren South", "Petitioner", or "the Company"), which is an indirect subsidiary of CenterPoint Energy, Inc.

Q. What is your role with respect to Petitioner Vectren South?

A. I am Market Development Manager.

Q. Please describe your educational background.

A. I earned a Bachelor of Science degree in Aeronautical Engineering from the United States Air Force Academy in 2002 and Master of Science degrees in Aeronautical and Systems Engineering from the Air Force Institute of Technology in 2007. I also earned a Master of Business Administration from the University of Southern Indiana in 2016.

Q. Please describe your professional experience.

A. I have been employed by the Company since 2013 in a variety of positions including as load forecast analyst and underground gas storage engineer. I have been in my current position for approximately 4 years concentrating in emerging technologies, competitive energy business development, and generation transition.

Q. What are your duties and responsibilities as Market Development Manager?

A. I have primary responsibility for research in emerging energy technology including as project manager and primary investigator in a Department of Energy funded research partnership. I also have responsibility in Vectren South's generation transition department aiding in the execution of projects to support the Company's transition to sources of

1 renewable energy.

2
3 **Q. Have you previously testified before the Indiana Utility Regulatory Commission**
4 **("Commission")?**

5 A. No.

6
7 **Q. Are you sponsoring any exhibits in support of your testimony?**

8 A. No, not at this time.

9
10 **Q. What is the purpose of your Direct Testimony in this proceeding?**

11 A. My testimony will provide an update on the Urban Living Research Center ("ULRC" or the
12 "Project") rooftop-based solar generating facility approved by the Commission under
13 Cause No. 44909.

14
15
16 **II. UPDATE ON ULRC PROJECT**

17
18 **Q. What is the current status of the ULRC Project?**

19 A. The ULRC is part of a larger, mixed-use, multifamily development called the "Post House"
20 which was completed and opened mid-2020. Throughout this testimony "Post House"
21 refers to the overall developer-owned property and buildings, and "ULRC" refers to
22 Vectren South's specific interests within the Post House, although the terms are often
23 used interchangeably. The Post House/ULRC originated as a partnership in response to
24 the Regional Cities Initiative, which aims to retain and attract talent by enhancing the
25 quality of Indiana communities. In December of 2015, the State of Indiana chose
26 Southwest Indiana as one of three regions to receive \$42 million in state matching funds
27 geared toward economic development. The ULRC includes a mix of smart energy using
28 devices that will help the Company research new products and services to help customers
29 manage their energy use. The Company was awarded \$1 million in funding from the
30 Department of Energy's ("DOE") Building Technologies Office to advance research in grid-
31 interactive buildings in partnership with Oak Ridge National Laboratory. This research
32 has begun and is on track to deliver the primary objectives of implementing advanced

1 algorithms for optimizing energy use and peak load in individual apartments and at
2 building level. The technology is intended to integrate with the roof-top solar and the
3 research funds are helping to offset some costs related to this project.
4

5 **Q. What is the status of the rooftop solar component of the project?**

6 A. It was necessary to redesign the rooftop solar layouts to accommodate the as-built rooftop.
7 This and other factors led to delays in construction of the rooftop solar arrays which is now
8 slated for the end of the second quarter 2021. The constraints imposed by the as-built roof
9 layout and weight loading limitations reduced the total available rooftop space and feasible
10 array capacity to about 120 kW-DC. In the resulting design, newer technology panels with
11 higher output were used to maximize the solar output in the available space. In addition,
12 railing fall protection was selected which significantly reduced cost compared to the life-
13 line fall-protection system.
14

15 **Q. What was the original purpose and scope of the rooftop solar?**

16 A. Vectren South originally intended to demonstrate the integration of distributed solar on the
17 ULRC with advanced building controls, battery storage, and the local distribution system.
18 The battery storage scope was removed due to complications previously detailed in
19 Vectren South's Witness Sears' testimony in Cause No. 44909-CECA 2. Vectren South
20 notified the Commission of this change in scope, requested approval for a corresponding
21 decrease in the project's cost estimate (from \$2 million to \$1.5 million), and received such
22 approval in the Commission's Order in Cause No. 44909 CECA-2, dated May 13, 2020.
23 The purpose of the remaining aspects of the project is unchanged – to discover and extract
24 the benefits of decentralized integration of distributed renewables within the electric
25 distribution system and implement optimal energy management strategies.
26

27 **Q. What challenges did Vectren South encounter during the design of the rooftop solar
28 system?**

29 A. The cost of implementing distributed renewable generation in an urban environment is
30 variable and highly dependent upon the unique configuration of the proposed host site. In
31 the case of the Post House, the as-built rooftop varied significantly from the architectural
32 plans. Consequently, the solar layouts were redesigned which reduced the total capacity

1 and redistributed the weight loading. The resulting arrays were smaller which led to a
2 higher concentration of the equipment and ballast weight. In addition, the fall protection
3 system was redesigned to save cost while still providing the Occupational Safety and
4 Health Administration ("OSHA") required level of safety for rooftop workers. Finally, the
5 COVID pandemic delayed construction and ultimately the building opening. This also
6 delayed the design completion and installation of the solar equipment.

7
8 **Q. What are the advantages of installing the rooftop solar at the ULRC specifically?**

9 A. The ULRC offers a unique opportunity to integrate rooftop solar with advanced building
10 controls. The DOE funding award discussed below was awarded based on the close
11 integration of rooftop solar with the control of building loads. The research proposal aims
12 to develop optimal control algorithms that interact with the variability of distributed
13 generation and improve the interactivity and power dispatchability of the building system
14 as a whole.

15
16 **Q. What is the updated project timeline for the ULRC?**

17 A. The contract to install the rooftop solar should be awarded early in 2021 with installation
18 occurring by the end of the second quarter of 2021. The rooftop and equipment room
19 leases have commenced; however, the equipment room rent was abated until February
20 2021. The research timeline, discussed further below, is on track to implement the new
21 energy optimization algorithm within the building control system by the end of 2021 with
22 testing and validation slated for 2022.

23
24 **Q. What impact will the changes to the solar facility have on Vectren South's cost
25 estimate?**

26 A. About \$452,000 have been accrued to date in the rooftop solar project. The delays
27 experienced in 2020 added unexpected costs to the project for redesign, labor, and
28 loadings; however, a new railing fall-protection system was designed which is expected to
29 reduce the total EPC cost offsetting the increase. The reduced size of the final solar array
30 should result in cost savings due to a reduction in materials and labor. In addition, some
31 portion of additional funding received by Vectren South from the DOE (as described in the
32 next section of my testimony) will be applied to reduce the final cost and serve to offset

the cost Vectren South is seeking to recover for the ULRC Project.

III. GRANT FUNDING AND RESEARCH AND DEVELOPMENT

Q. Please provide an update on Vectren South's pursuit of grant funding for the ULRC project.

A. The DOE Building Technologies Office awarded Vectren South \$1 million in funds to advance research on grid-interactive buildings in partnership with Oak Ridge National Laboratory. Terms and conditions of accepting the funds were renegotiated following the discontinuation of the battery scope but DOE eventually awarded the full amount for the solar and smart-controls integration. The objective of this research is to combine and optimize the internet-connected electric loads (i.e. heating, air-conditioning and water-heating) and solar photovoltaic generation hosted at the ULRC to supply increased efficiency, flexibility and reliability to the distribution system. The study will also examine the "split-incentive barrier" which stems from the fact that building owners do not have a financial incentive to make energy-efficient improvements since the residents are responsible for paying energy bills. The research will measure benefits recovered by building owners as a result of certain factors such as increased resident satisfaction from smart-home amenities and sustainability and resilience. Addressing the split-incentive barrier is one step towards widespread adoption of energy efficiency in multifamily buildings.

Q. How will the DOE funding be allocated?

A. The original \$1 million funding award was divided with approximately 40% going to Oak Ridge National Laboratory to fund their participation, and the remaining approximately 60% being directed to Vectren South to offset research project expenses.

Q. Will any of the DOE funding offset the cost Vectren South is seeking to recover for the ULRC Project?

A. Yes. The DOE award was officially activated in August 2020 and funds requested from DOE through December 31st, 2020 cover labor and associated loadings for approximately

1 5 months. The total amount requested through the end of 2020 equals \$20,176.91 some
2 of which directly offsets the amount Vectren South would seek to recover for the ULRC
3 project.

4
5
6 **IV. COSTS**

7
8 **Q. What costs did the Commission approve for the ULRC Project?**

9 A. The Commission found that Vectren South's cost estimates were reasonable and the best
10 cost estimate available, and approved for recovery Vectren South's estimate of
11 approximately \$2 million for the ULRC Project. In Cause No. 44909-CECA 2, the
12 Commission approved a revision to the estimate to \$1.5 million.

13
14 **Q. What were the actual costs incurred for the ULRC through the end of the reporting
15 period?**

16 A. Vectren South has incurred \$452,151.77 through the reporting period of December 31,
17 2020, which includes System Design and Engineering, Design and Planning of Research
18 Findings, and Owner's Costs and Overheads. This amount does not include the \$376,017
19 for battery-related expenses that were removed from the project as discussed in Vectren
20 South's Witness Sears' testimony for Cause No. 44909-CECA 2.

21
22 **Q. Do you have any updates to the cost estimates provided in Cause No. 44909 for the
23 ULRC Project?**

24 A. No.

25
26 **Q. Is Vectren South seeking recovery for any of the costs incurred for the ULRC Project
27 in this proceeding?**

28 A. No. Vectren South is not seeking recovery for costs related to the ULRC Project at this
29 time, as the ULRC Project is not yet complete or in-service. Once the ULRC Project is in-
30 service, Vectren South will seek cost recovery in the appropriate CECA annual filing.

1 V. CONCLUSION

2

3 Q. Does this conclude your Direct Testimony in this Cause?

4 A. Yes, it does.

VERIFICATION

The undersigned, Roland A. Rosario, affirms under the penalties of perjury that the answers in the foregoing Direct Testimony in Cause No. 44909 CECA 3 are true to the best of his knowledge, information and belief.

A handwritten signature in cursive script, appearing to read 'Roland A. Rosario', written in black ink.

Roland A. Rosario