

SOUTHERN INDIANA GAS AND ELECTRIC COMP

D/B/A

VECTREN ENERGY DELIVERY OF INDIANA, INC.

CAUSE NO. 45052

VERIFIED DIRECT TESTIMONY

OF

CARL L. CHAPMAN

PRESIDENT AND CHIEF EXECUTIVE OFFICER

SPONSORING PETITIONER'S EXHIBIT NO. 1

VERIFIED DIRECT TESTIMONY
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1 **Q. Please state your name and business address.**

2 A. My name is Carl L. Chapman. My business address is One Vectren Square, Evansville,
3 Indiana 47708.

4 **Q. What is your position with Vectren Corporation (“Vectren”) and with Southern**
5 **Indiana Gas and Electric Company (“Vectren South”)?**

6 A. I am Chairman, President and Chief Executive Officer (“CEO”) of Vectren. I also serve
7 as CEO and Chair of the Board of Vectren Utility Holdings, Inc. (“VUHI”), and Chair of
8 the boards of Vectren South, Indiana Gas Company, Inc. (“Vectren North”) and Vectren
9 Energy Delivery of Ohio, Inc.

10 **Q. What is your educational background?**

11 A. I received a bachelor's degree in accounting, graduating summa cum laude from Ball
12 State University in 1977.

13 **Q. Please describe your business experience.**

14 A. I was named CEO in 2010 and Chairman in 2011. Prior to my current position, I was
15 named President and Chief Operating Officer of Vectren in 2007. I have served in
16 various other leadership roles at the company, including Executive Vice President and
17 President of Vectren Enterprises, Vectren's holding company for its non-regulated
18 subsidiaries and affiliates. Prior to the creation of Vectren in 2000, I served as the
19 Executive Vice President and Chief Financial Officer of Indiana Energy Inc., a Vectren

1 predecessor company. I began my career in the energy industry in 1985 with Vectren
2 North where I served in a number of roles, including Senior Vice President of Corporate
3 Development, Vice President of Planning, and Director of Planning, Budgeting and
4 Investor Relations. I began my professional career with Arthur Andersen, remaining
5 there until joining Vectren North in 1985.

6 **Q. What are your responsibilities as President and CEO of Vectren?**

7 A. I am the highest ranking executive of the Company with responsibilities including
8 developing and implementing high-level strategies, managing the overall operations and
9 resources of the Company, and acting as the main point of communication between the
10 board of directors and the corporate operations, including those of Vectren South and
11 Vectren's other utility subsidiaries.

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

14 A. Yes, I presented testimony in Cause No. 44446 in support of Vectren South's request for
15 a certificate of public convenience and necessity for federally mandated requirements, in
16 Cause No. 44429 in support of the Company's proposal to modernize and enhance the
17 safety and reliability of its gas distribution system, and in Cause No. 43839 in support of
18 the Company's base rate request.

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

20 A. My testimony provides an overview of Vectren South's proposed diversification of its
21 generation fleet based on its 2016 Integrated Resource Plan (the "IRP"). For decades,
22 Vectren South has relied on its coal fired units to provide reliable service to its
23 customers. In this case, Vectren South seeks authority to (1) make environmental
24 compliance investments to extend the life of Culley 3, its most efficient coal unit, and (2)

1 to invest in a new combined cycle gas turbine (“CCGT”) sized to replace its other coal
2 units which will be retired at the end of 2023. My testimony addresses the
3 reasonableness of this transition in terms of why it is the appropriate time to plan
4 retirement of these coal units. I will also discuss the thoughtful process used by Vectren
5 South in making these resource decisions.

6 **Q. Please describe Vectren South’s existing generation.**

7 A. Vectren South owns and operates five (5) coal units that provide approximately 1,000
8 megawatts (“MWs”) of baseload generation capacity. Following is a summary of those
9 units:

<u>Unit</u>	<u>Installed Capacity</u>	<u>Start Date</u>	<u>Age in 2023</u>
Culley 2	90 MW	1966	57
Culley 3	270 MW	1973	50
Warrick 4	150 MW	1970	53
Brown 1	245 MW	1979	44
Brown 2	245 MW	1986	37

10 As a result of environmental projects undertaken over the last fifteen (15) years, Vectren
11 South has drastically reduced the level of regulated airborne emissions from its coal
12 units and has made possible the beneficial reuse of most of its fly ash. Since 2005,
13 compliance with U.S. Environmental Protection Agency (“EPA”) environmental
14 requirements has required capital investment totaling approximately \$500 million in
15 various emission controls on these plants. Absent such investment, the units would
16 have been retired.

17 **Q. Were there benefits to Vectren South’s investment in emission control
18 investments beyond complying with federal requirements?**

19 A. Yes. Prior to these investments, Posey, Vanderburgh and Warrick Counties were in
20 non-attainment status with respect to the EPA’s National Ambient Air Quality Standards.

1 This designation made future economic development unlikely. Vectren South's clean
2 coal compliance projects were successful in terms of helping to change the counties to
3 attainment status, thereby eliminating this obstacle to economic development in the
4 region.

5 Further, as a result of extending the operating life of these units, use of Indiana coal for
6 generation has been supported. Our units annually burn over 2 million tons of Indiana
7 coal. Under the diversification plan, this level of coal use will continue through 2023.
8 Thereafter, Culley 3 will continue to use approximately 800,000 tons of coal on an
9 annual basis based on the ability to engage in the proposed Effluent Limitation Guideline
10 ("ELG") and Coal Combustion Residuals ("CCR") compliance projects.

11 Finally, the extended life of the units has allowed additional time for certain technology
12 advances that can now be of benefit to Vectren South as it weighs its resource options.

13 **Q. You referenced this being the right time to diversify the Company's generation**
14 **resources. Please elaborate.**

15 A. The Commission Staff's final IRP Report does an excellent job of summarizing the reality
16 of current conditions. The Staff Report recognizes that Indiana, as part of the
17 interconnected power system, is affected by "the enormity of changes throughout the
18 region and nation."¹ More specifically, the Staff Report notes that:

19 The primary *driver* of the change in resource mix is due to relatively low cost
20 natural gas and long-term projections for the cost of natural gas to be lower
21 than coal due to *fracking* and improved technologies. As a result, coal-fired
22 generating units are not as fully dispatched (or run as often) by MISO or PJM.
23 The aging of Indiana's coal fleet, the dramatic decline in the cost of
24 renewable resources, the increasing cost-effectiveness of energy efficiency
25 as a resource, and environmental policies over the last several decades that

¹ Final Director's Report for the 2016 Integrated Resource Plans, Dr. Bradley Borum, Nov. 2, 2017 ("Staff Report"), p.5.

1 reduced emissions from coal-fired plants are also drivers of change. (Staff
2 Report, Id. n.5)

3 To this I will add that the improvement in CCGT efficiency is another major factor. The
4 units being considered have heat rates of 6,200 – 6,800 compared to our existing coal
5 units which average 11,001. And, these gas units have the operating capability to ramp
6 up and down in response to Midcontinent Independent System Operator (“MISO”)
7 dispatch instructions, unlike our coal units which struggle to reliably operate in such a
8 dynamic manner. In addition to these general considerations, there are also unit specific
9 reasons that drive the transition at this time.

10 **Q. Please explain your statement that unit specific considerations also drive the**
11 **timing of Vectren South's generation diversification strategy.**

12 A. The coal units to be retired are comparatively small units that suffer in terms of cost
13 competitiveness and efficiency. Specifically, Culley 2 is a 90MW unit that will be 57
14 years old in 2023. Its poor efficiency results in its recent dispatch rate of approximately
15 22%. While it currently contributes to system capacity to meet our reserve requirements
16 without much incremental cost (it essentially benefits from the environmental
17 investments at Culley Unit 3), it does not make sense to continue to invest capital to
18 extend the life of this unit.

19 With respect to the Brown units, the biggest issue that impairs their longer term
20 operation is the existing scrubbers built in 1979 and 1986. To our knowledge, these are
21 the only dual alkali scrubbers remaining in utility operation in the country. This
22 technology creates a high variable operating cost in terms of both chemicals needed for
23 operation and the ongoing damage done to the plant resulting from an acidic residue
24 mist they create that corrodes the plant. Based on a study performed by Black &
25 Veatch, to operate the units beyond 2023, this aging technology would need to be

1 replaced no later than 2028 at a cost of approximately \$340 million. Such an investment
2 would provide a new, better scrubber with lower variable operating cost, but it would not
3 address the Brown units' poor heat rate (as compared to a CCGT), nor the need to
4 invest further in environmental controls to address Effluent Limitations Guidelines
5 ("ELG") and Coal Combustion Residuals ("CCR") requirements. It makes far more
6 sense to retire these units and invest in new CCGT technology.

7 Finally, the co-owned Warrick 4 unit suffers from the issues generally facing aging, small
8 coal plants, but also has the unique factor of being co-owned with ALCOA. ALCOA's
9 Warrick operations have recently gone through dramatic ownership and operational
10 changes, with ALCOA's corporate reorganization and the closing and then re-opening of
11 the Warrick smelter. The future of the local operations is uncertain, including the need
12 for this unit given the site load is reduced and there are three other units on site that
13 provide energy directly to the operations. Also, certain environmental exceptions for this
14 "industrial unit" could be lost in the future, and ALCOA's financial support of half of the
15 unit costs could end. In this setting, while Vectren South has agreed to retain its
16 involvement in the unit through 2023 to support the re-opening of the smelter, beyond
17 that point it does not make sense to continue to invest in a unit that could be subject to
18 shut down if the co-owner decides it has no continuing need for that capacity.

19 **Q. Given the conditions that challenge coal units, why does Vectren South propose**
20 **to make incremental investments in Culley 3 so that it can operate beyond 2023?**

21 A. Culley 3 is our largest, most efficient unit. It is fitted with air emission controls that can
22 operate indefinitely, including a scrubber. Culley 3's ELG compliance requirements can
23 be addressed as set forth in this case so the unit can reasonably continue to operate.
24 Even if system wide carbon limits are once again put in place in the future, the
25 retirement of our other coal units should provide the ability to meet such requirements.

1 Retaining some coal generation contributes to our diverse resource approach and
2 supports the local economy through the use of Indiana coal.

3 **Q. Why does Vectren South prefer the concept of a diversified generation portfolio?**

4 A. Our initial 2016 IRP economic modeling concluded that under the most-likely future
5 state, the lowest cost option was to retire all of our coal units and replace them with gas
6 generation. This outcome reflects the low gas prices that are forecasted by almost every
7 expert to remain relatively low and stable throughout the planning period. For example,
8 it has often been the case in the past year that the NYMEX ten (10) year gas strip shows
9 the market price of gas in year ten (10) to be either the same or lower than the current
10 market price. This favorable gas market exists because of the massive low cost
11 production of shale gas in a number of basins that is projected to continue for decades.

12 While switching entirely to gas-fired generation might have the lowest net present value
13 ("NPV") from a modeling perspective, such a single fuel portfolio would lack diversity,
14 and therefore, introduce risk to customers if gas prices or other assumptions embedded
15 in the model that favored gas turn out to be wrong. If the Company made the switch to
16 all gas, Vectren South could not offset the volatility through reliance on other forms of
17 generation. In 2000 when Vectren was created by a merger, the decision to rely on coal
18 for all of the Company's baseload requirements had been made in the 1970s and 1980s
19 based on abundant, low cost, locally mined coal. That choice made sense then given
20 coal proximity, the jobs it supported in Southwestern Indiana and the economics of coal-
21 fired generation. Now, as units retire, we have the opportunity to ensure diversity going
22 forward via a mix of gas, coal, renewables and energy efficiency. The decision to be
23 diverse at a somewhat higher projected net present value ("NPV") cost responds to risk
24 and has been supported by the Commission in recent generation cases. Moreover, as
25 part of a transition plan, retention of Culley 3 has beneficial local economic impacts.

1 **Q. The projects forming the subject matter of this case relate to coal and gas. Does**
2 **Vectren South plan to add other diverse resources to its portfolio?**

3 A. Yes. Vectren South is currently constructing two small solar arrays (4 MWs) on our
4 system. Consistent with the IRP, we have also negotiated terms for development of a 50
5 MW solar project on our system. While an intermittent resource, solar has low variable
6 costs and is complemented by the use of gas generation (CCGT) as a reliability backup.
7 We plan on filing for approval of the solar project in the second quarter of 2018.

8 **Q. Given the significance of this transition, has Vectren South devoted significant**
9 **time and resources to the evaluation of its generation alternatives?**

10 A. Yes. Throughout 2016 and 2017, we have worked closely with leading experts to study
11 key factors impacting our decision making such as resource operating costs, unit
12 efficiency, evolving technologies, capital costs, transmission infrastructure and
13 congestion, energy efficiency and risks. As discussed by Vectren South witness Luttrell,
14 we also thoroughly evaluated a number of options including partnering with another
15 utility, competitive options and multiple self-build options.

16 **Q. Vectren South received authority in January 2015 to install clean coal technology**
17 **on its Brown and Culley units in order to comply with the Mercury Air Toxics**
18 **regulations (“MATS”) and other EPA emissions requirements, and thereby extend**
19 **the useful life of these units. In hindsight, do those compliance projects continue**
20 **to represent a reasonable investment to ensure reliable service?**

21 A. Yes. Based on those projects, our coal units have been able to operate nine (9)
22 additional years through 2023. Not only does that allow the full depreciation of our
23 environmental equipment installed in these units from 2005-2012, it also has extended
24 the use of Indiana coal for as long as reasonably possible. Moreover, this period has

1 allowed us the time to carefully evaluate and plan for the diversification of our
2 generation, including the lead time needed to build a CCGT.

3 **Q. In terms of the resource evaluation, please comment on the criteria used to select**
4 **the recommended resources to replace the retiring units.**

5 A. While quantitative analysis was performed on various options to determine the
6 comparative costs, qualitative factors were also emphasized so that the final decision
7 would reflect reasoned evaluation that considered a number of issues and risks in
8 addition to cost. Resource location was a very important consideration for a variety of
9 reasons, including: (1) reliability of on-system generation versus off-system generation
10 that would have to rely on transmission for delivery to our system of 70% of our
11 baseload requirements; (2) the benefits of local generation at a brownfield site that could
12 offset some of the job and tax base loss resulting from the coal unit retirements; and (3)
13 credit risk in terms of a resource fully controlled by Vectren South versus reliance on a
14 third party merchant developer over a long period of time to provide reliable,
15 uninterrupted power to Vectren South.

16 **Q. Does the recommended CCGT self-build project at the Brown site reflect this**
17 **analysis?**

18 A. Yes. On an NPV basis the self-build CCGT unit is slightly less expensive than the
19 competitive option produced by our RFP process. However, this small difference is not
20 the main reason to select the self-build option. Use of off-system generation to supply
21 the majority of our baseload requirements would expose the Company and its customers
22 to potentially significant grid congestion costs and even delivery impairment for a period
23 of thirty (30) or more years. Further, the self-build approach eliminates any third party
24 developer credit risk. This option also benefits the local economy. If the Brown units
25 were retired and the replacement units were located in Central Indiana, Posey County

1 would lose approximately \$3 million of tax revenues. The benefits of reliable, local
2 generation have been recognized by the Commission.

3 **Q. Vectren South proposes to build a fired unit that provides approximately 850 MW**
4 **of capacity which, in conjunction with an additional 50 MWs of solar, leaves the**
5 **Company with a healthy capacity surplus throughout the planning period. Why is**
6 **Vectren South proposing this unit rather than a smaller unit?**

7 A. Vectren South witness Games explains that Vectren South is proposing to build an “F”
8 class CCGT that is a “fired” unit, meaning that it includes additional gas fired burners
9 enabling it to produce more electricity. This unit can be built as either fired or unfired.
10 Firing the unit provides an additional 150 MWs at a very low upfront capital cost,
11 approximately \$15 million. Adding the firing equipment is only practical if incorporated
12 into the design and initial construction so the decision to invest in firing must be made at
13 the outset. Obtaining this added capacity at such a low cost greatly enhances our long-
14 term flexibility. For example, we stand ready to serve a new large customer without
15 being short capacity. We also have this low cost reliable capacity resource that can
16 back up increasing use of renewable resources over time. The modeling performed by
17 the Company, explained in more detail by Vectren South witness Lind, demonstrates
18 that installation of the firing equipment on the CCGT ultimately reduces the overall NPV
19 of the facility to customers because of the very low cost associated with the incremental
20 capacity.

21 **Q. Given the many benefits of the self-build CCGT option, did the competitive**
22 **solicitation conducted by Vectren South provide an option that was seriously**
23 **considered during the evaluation process?**

24 A. Yes. We used a consultant to oversee the RFP process and perform the cost and risk
25 analysis of each bid. This evaluation yielded a viable bid that was then compared to our

1 other supply options. Because the options were very close in terms of cost, the choice
2 to have the unit be on system and 100% owned and controlled by Vectren South was
3 not difficult. The RFP results validate our own study process and provide assurance of
4 the reasonableness of the proposed project.

5 **Q. Apart from the self-build options and the RFP responses, did Vectren South**
6 **consider any other approach to obtaining an ownership interest in a CCGT?**

7 A. Yes. We also found a potential partner interested in a jointly owned unit. The partner
8 was a Midwestern utility interested in some merchant wholesale power to sell to other
9 entities. Together we studied a 70/30 ownership arrangement in a larger H-class unit.
10 This provided Vectren South the opportunity to own 70% of a larger unit with an
11 improved heat rate. This option, also located at Brown, was determined to be very
12 competitive. Unfortunately, our partner could not sell the energy under firm longer term
13 commitments and, after months spent negotiating ownership terms, the discussions
14 were terminated.

15 **Q. Will approval of the proposed generation projects have a significant impact on**
16 **customer rates?**

17 A. Yes, over time. However, the 2016 IRP analysis supports this approach as less costly
18 than continuing to rely on the existing coal plants. Continuing to invest financially in
19 these old plants ignores all the unfavorable conditions that challenge their ability to
20 operate cost effectively, and fails to recognize the benefit of low priced gas used in a
21 highly efficient CCGT unit. If approved, the new CCGT is scheduled to come on line and
22 replace the retiring coal units in 2023, six (6) years from now. A rate case will then be
23 filed, and the rate impact of the CCGT will not occur until late 2024 or early 2025. The
24 Culley 3 project has a very modest impact on rates in the interim. And, this impact is
25 more than offset by the federal tax rate decrease that will be flowed back to customers.

1 Once the new CCGT unit is on line, it will have far lower variable costs and will support
2 potential customer growth that occurs between now and 2023, as well as future growth
3 beyond 2023.

4 **Q. Apart from the cost to build the new CCGT, are there any other costs associated**
5 **with the planned coal unit retirements?**

6 A. The plants will not be retired until the end of 2023, six (6) years from now. During this
7 operating period the plants will continue to be depreciated. Additional investment to
8 continue operations until 2023 will be limited to the extent possible.

9 Based on an initial analysis of the plant balances and current depreciation rates, Vectren
10 South projects relatively small remaining balances at the time of retirement of Culley 2
11 and Warrick 4. Brown is projected to have a larger remaining plant balance of around
12 \$200 million, with the exact balance dependent on how many plant assets can be reused
13 to operate the new CCGT (items such as water intake, office and storage space, roads
14 and land, substation assets, etc.), and the amount of capital investment needed to retain
15 Brown operations through 2023. Given the intervening period of operation, and the need
16 for approval of the new CCGT and its actual construction, at this time we do not propose
17 to increase depreciation rates to reduce the projected Brown retirement balance.

18 Ultimately, such a plant balance represents approved investment in plant used for many
19 years to serve customers, and so recovery of that investment will be sought. One
20 possible approach may be at the time of the 2023 rate case to take a large portion of the
21 Brown plant balance and embed it in the new depreciation rates for the CCGT. For now,
22 we plan to continue to avoid large rate increases, operate our plants, and engage in
23 economic development. While there could be circumstances requiring us to file a rate

1 case sooner than the currently planned case in 2023/2024, for now the plan remains that
2 these retirement costs will be addressed at the time of the actual retirements.

3 **Q. In terms of continuing to avoid rate increases, please explain what you mean.**

4 A. Subsequent to the 2011 base rate increase, Vectren South's objective has been to hold
5 rates flat. This objective has been achieved with our rates today being essentially the
6 same as those in place in 2011. Required investment in ELG and MATS compliance
7 (which we propose to begin recovery of in this proceeding), and the recovery of
8 investments under the TDSIC Plan to improve system reliability, will begin to gradually
9 increase rates; however, the federal tax reduction should offset those costs for the next
10 few years. As a result, until the CCGT goes in service, our rates from 2011-2024 only
11 increase gradually over the last few years due to the TDSIC Plan. The rate case
12 planned in late 2023/2024 will reflect the new CCGT in rates.

13 **Q. Is Vectren South seeking any financial support during the period of CCGT
14 construction?**

15 A. Yes, the company is requesting authority to accrue AFUDC and defer depreciation until
16 the investment of over \$781 million is placed in rates after it goes into service. The
17 CCGT investment will be the largest single utility investment ever undertaken by Vectren
18 South. The requested relief will support our financing plan and help us avoid earnings
19 erosion.

20 **I. Conclusion**

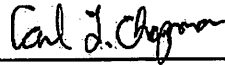
21 **Q. Does this conclude your prepared direct testimony?**

22 A. Yes, at this time.

23

VERIFICATION

The undersigned, Carl L. Chapman, 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.



Carl L. Chapman