BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

In the Matter of:

DOCKET NO. 20240025-EI

Petition for rate increase
by Duke Energy Florida.
___________________________/

VOLUME 4
PAGES 664 - 878

PROCEEDINGS: HEARING

COMMISSIONERS
PARTICIPATING: CHAIRMAN MIKE LA ROSA
COMMISSIONER ART GRAHAM
COMMISSIONER GARY F. CLARK
COMMISSIONER ANDREW GILES FAY
COMMISSIONER GABRIELLA PASSIDOMO

DATE: Wednesday, August 21, 2024

TIME: Commenced: 11:00 a.m.
Concluded: 1:30 p.m.

PLACE: Betty Easley Conference Center
Room 148
4075 Esplanade Way
Tallahassee, Florida

REPORTED BY: DEBRA R. KRICK
Court Reporter

APPEARANCES: (As heretofore noted.)

PREMIER REPORTING
TALLAHASSEE, FLORIDA
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I N D E X

P R O C E E D I N G S

(Transcript follows in sequence from Volume 3.)

(Whereupon, prefiled direct testimony of James R. Dauphinais was inserted.)

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In Re: Petition for increase in rates By Duke Energy Florida, LLC _______________________________ /	DOCKET NO. 20240025-EI FILED: June 11, 2024

CONFIDENTIAL PER DESIGNATION OF THE COMPANY

DIRECT TESTIMONY

OF

JAMES R. DAUPHINAIS

ON BEHALF

OF

THE CITIZENS OF THE STATE OF FLORIDA

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C22-1660

Table of Contents

LIST OF EXHIBITS

C22-1662

Exhibit JRD-16	Public Non-Voluminous Discovery Responses Cited to by Mr. Dauphinais in his Direct Testimony
Exhibit JRD-17	Confidential Non-Voluminous Discovery Responses Cited to by Mr. Dauphinais in his Direct Testimony
Exhibit JRD-18	Confidential Desposition Transcript Excerpts Cited to by Mr. Dauphinais in his Direct Testimony
Exhibit JRD-19	Deposition Late Filed Exhibits Cited to by Mr. Dauphinais in his Direct Testimony

DIRECT TESTIMONY

OF

JAMES R. DAUPHINAIS

On Behalf of the Office of Public Counsel

Before the

Florida Public Service Commission

Docket No. 20240025-EI

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. James R. Dauphinais. My business address is 16690 Swingley Ridge Road, Suite 140, Chesterfield, MO 63017.

Q. WHAT IS YOUR OCCUPATION?

A. I am a consultant in the field of public utility regulation and a Managing Principal of Brubaker & Associates, Inc. ("BAI"), energy, economic and regulatory consultants.

Q. ON WHOSE BEHALF ARE YOU APPEARING IN THIS PROCEEDING?

A. I am appearing on behalf of the Florida Office of Public Counsel ("OPC").

C22-1664

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND.

A. In 1983, I graduated from Hartford State Technical College with an Associate's Degree in Electrical Engineering Technology. Subsequently, I completed undergraduate studies at the University of Hartford and was awarded a Bachelor's Degree in Electrical Engineering. I have also completed graduate level courses in the study of power system analysis, power system transients and power system protection through the Engineering Outreach Program of the University of Idaho.

Q. PLEASE DESCRIBE YOUR EXPERIENCE.

A. I have over 39 years of experience in the electric utility industry, which began with the start of my employment as an Engineering Technician in the Transmission Planning Department of the Northeast Utilities Service Company ("NU," now "Eversource Energy") in 1984. In 1990, upon the completion of my undergraduate studies in electrical engineering, I was promoted to the position of Associate Engineer within the Transmission Planning Department. By 1996, I had been promoted to the position of Senior Engineer within the Transmission Planning Department.

In the employment of NU, I was responsible for conducting thermal, voltage and stability analyses of the NU's electric transmission system to support planning and operating decisions. This involved the use of load flow, power system stability and production cost computer simulations. It also involved examination of potential solutions to operational and planning problems including, but not limited to, transmission line solutions and the routes that might be utilized by such transmission line solutions.

C22-1665

In 1997, I joined the firm of BAI. The firm includes consultants with backgrounds in accounting, engineering, economics, mathematics, computer science and business. Since my employment with the firm, I have been involved with a wide variety of electric power and electric utility issues including, but not limited, to: ancillary service rates, avoided cost calculations, certification of public convenience and necessity, class cost of service, cost allocation, fuel adjustment clauses, fuel costs, generation interconnection, interruptible rates, market power, market structure, off system sales, prudency, purchased power costs, resource planning, rate design, retail open access, standby rates, transmission losses, transmission planning, transmission rates, and transmission line routing. I have provided expert testimony on all of the foregoing. This expert testimony has been provided to the Federal Energy Regulatory Commission ("FERC") and the utility regulatory bodies of 21 states or provinces, including the Florida Public Service Commission ("Commission" or "FPSC"). I provide further information on my education and background in Appendix A to my testimony.

Q. PLEASE ELABORATE ON YOUR EXPERIENCE WITH RESPECT TO RESOURCE PLANNING ISSUES.

A. During my employment with NU, prior to the implementation of FERC Order Nos. 888 and 889, the transmission planning organization within whom I was employed was integrated with, and part of, the same functional organization as NU's generation planning organization. This integration led to significant involvement by transmission planning, including myself, in resource planning analyses (e.g., the analysis of the potential net benefit of retirement of existing generation resources) and resource planning in transmission planning analyses (e.g., whether to proceed with economic transmission upgrades). In addition, while employed at NU, I made significant usage of the General Electric Company Multi-Area Production Simulator ("MAPS") to analyze the generation production costs associated with various transmission operating and planning alternatives on the NU system.

Subsequently, during my employment with BAI since 1997, I have become further involved with resource planning issues, initially in support of my colleagues at BAI and later in a lead position. This work has included the review of electric utility resource plans, the review of proposed certificates of public convenience and necessity for new electric utility generation resources, the forecasting of future market prices, the forecasting of future utility rates and the evaluation of long-term power supply options. I have conducted this work both for intervenors in regulatory proceedings and specific retail end-use customer clients of BAI who were evaluating their future power supply options. I have also been extensively involved in the development of Independent System Operator ("ISO") and Regional Transmission Organization ("RTO") - administered power markets including, but not limited to, issues related to markets for energy, operating reserves and capacity.

Q. PLEASE IDENTIFY SOME OF THE CASES IN WHICH YOU PROVIDED TESTIMONY WITH RESPECT TO RESOURCE PLANNING ISSUES.

A. In the past 19 years, I have provided testimony on resource planning and/or the prudency issues related to resource planning in Indiana Utility Regulatory Commission

("IURC") Cause No. 42643, Louisiana Public Service Commission ("LPSC") Docket No. U-30192, IURC Cause No. 43393, IURC Cause No. 43396, Colorado Public Utilities Commission ("CPUC") Docket Nos. 09A-324E and 09A-325E, IURC Cause No. 43956, IURC Cause No. 44012, New Mexico Public Regulatory Commission ("NMPRC") Case No. 13-00390-UT, NMPRC Case No. 15-00261-UT, NMPRC Case No. 17-00174-UT, NMPRC Case No. 19-00018-UT, NMPRC Case No. 19-00195-UT, NMPRC Case No. 21-00083-UT, NMPRC Case No. 23-00353-UT, Michigan Public Service Commission ("MPSC") Case No. U-21090, MPSC Case No. U-21193, FPSC Docket Nos. 160186-EI and 160170-EI (with respect to Scherer Unit 3 in the 2016 Gulf Power Company base rate case), and FPSC Docket No. 20190061-EI (with respect to Florida Power & Light Company's SolarTogether Program and Tariff).

In a number of these proceedings, I had extensive involvement in the review of the utility's Aurora XMP®, EnCompass® or Strategist® resource planning analysis. In the case of EnCompass® and Strategist®, this has included either me personally running the modeling tool or having modeling runs performed under my direction and supervision by other members of the BAI team, based upon data provided by subject utility.[1] As discussed in the Direct Testimony of Duke Energy Florida, LLC ("DEF"

[1] Strategist®, which includes a module called Proview®, is a computer software tool produced by Ventyx that allows resource planners to examine a very large number of alternative resource portfolios with the goal of identifying through an optimization algorithm the most cost effective resource portfolio for an electric utility. It can also be used in a probabilistic mode to test the robustness (i.e., risk) of specific resource portfolios over a wide range of assumption variations. Strategist® is currently utilized, and has been utilized in the past, by many electric utilities to conduct their resource planning. Other commercial software tools that have some or all of the functionality of Strategist® include software tools such as System Optimizer®, PLEXOS®, Aurora XMP® and EnCompass®. Of these, Aurora XMP®, PLEXOS® and EnCompass® have become more commonly used in recent years due to their greater functionality and more robust solution technique.

C22-1668

or "Company") witness Borsch, DEF uses EnCompass® to support its Integrated Resource Planning ("IRP") process.[2]

Q. PLEASE EXPAND ON YOUR PREVIOUS EXPERIENCE WITH THE ENCOMPASS MODELING TOOL THAT DEF USES IN ITS IRP PROCESS?

A. I have received past training for EnCompass® from its vendor, Anchor Power Solutions, and have personally run EnCompass® for resource optimization and production cost analysis for testimony I have presented before the NMPRC and MPSC.

Q. DO YOU HAVE PREVIOUS EXPERIENCE WITH STOCHASTIC LOSS OF LOAD PROBABILITY ("LOLP") ANALYSIS THAT IS COMMONLY USED TO EVALUATE THE RESOURCE ADEQUACY OF ELECTRIC UTILITIES?

A. Yes. I have received past training with respect to SERVM® – a software modeling tool that was developed by Astrapé Consulting to perform LOLP analysis. SERVM® is used by many utilities for LOLP analysis. In addition, I have had members of the BAI staff perform SERVM® runs under my direction and supervision for testimony I have presented before the NMPRC. Also, SERVM® is the primary modeling tool used by the Midcontinent Independent System Operator, Inc. ("MISO") for the capacity accreditation and Loss of Load Expectation ("LOLE") analysis it presents to the MISO Resource Adequacy Subcommittee and the MISO Loss of Load Expectation Working Group, both of which I regularly attend as a representative of

[2] Borsch Direct at 17.

C22-1669

large end-use customer groups located in Illinois, Indiana, Louisiana, Michigan and Texas.

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY IN THIS DOCKET?

A. I present testimony with respect to the prudence, reasonableness, and cost effectiveness of DEF's already incurred and proposed investments for the following supply-side resource projects:

- DEF's currently estimated \$154.9 million investment in Combined Cycle Generation Efficiency Improvement Projects ("CCE Projects") that are currently expected to be fully completed by the end of 2026.[3,4]

- DEF's currently estimated \$1.663 billion investment in 14 proposed new 74.9 MW_{AC} solar photovoltaic generation facilities that are currently projected to enter service between 2025 and 2027 ("2025-2027 Solar Projects").[5]

- DEF's currently estimated \$164.5 million investment in its proposed Powerline 100 MW, 2-hour Battery Storage facility that it projects to enter service in 2027 ("Powerline Battery Project").[6]

DEF's 2024 Ten-Year Site Plan ("TYSP") estimate of the total firm capacity that would be provided by these projects is summarized below.

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[3] Anderson Exhibit RDA-3 and DEF Response to OPC ROG No. 118 (Amended on June 7, 2024).
[4] When I use the words "current" and "currently" in this direct testimony, it means current or currently as of the filing date of this direct testimony based on the latest information provided by DEF through discovery and depositions.
[5] DEF Response to OPC ROG No. 118 (Amended on June 7, 2024) and Confidential DEF Response to OPC ROG No. 186.
[6] Jacob Direct at 5.

TABLE JRD-1

Estimated Total Firm Capacity
(MW)

	Summer	Winter
CCE Projects	389	347
2025-2027 Solar Projects	262	0
Powerline Battery Project	90	90

Source: DEF 2024 TYSP, April 22, 2024 at Schedule 8

Collectively, these projects represent the largest driver of the increase in DEF's rate base in its three proposed projected test years for this base rate proceeding (calendar years 2025, 2026 and 2027).

Note that the scope of my direct testimony does not go toward the issue of whether DEF should be permitted to have multiple projected test years or to the proper level of projected capital expenditures for the CCE Projects, 2025-2027 Solar Projects or the Powerline Battery Project that should be utilized in each proposed projected test year for setting base rates for those projected test years. Those are extremely important questions in this proceeding as they present a serious risk of over-recovery particularly with respect to DEF potentially later delaying its projected investments, later delaying the projected in-service date of its projected investments, or ultimately not even making its projected investments. These issues are addressed by other OPC witnesses besides myself. My direct testimony instead concentrates on whether these investments once they enter service should be allowed to be reflected in projected test year revenue

C22-1671

requirements at all assuming the Commission grants DEF rates based on three projected test years.

Finally, the fact that I do not address any other particular issues in my testimony or am silent with respect to any portion of DEF's Petition or direct testimony in this proceeding should not be interpreted as an approval of any position taken by DEF.

Q. WHAT DID YOU REVIEW PRIOR TO PREPARING YOUR DIRECT TESTIMONY?

A. I reviewed DEF's petition in this proceeding along with the direct testimony in this proceeding of DEF witnesses Olivier, Panizza, Goff, Jacob, Anderson, Borsch, and Seixas. I have also reviewed DEF's responses to discovery in this proceeding regarding the issues of resource planning, Investment Tax Credits ("ITCs"), Production Tax Credits ("PTCs"), the CCE Projects, the 2025-2027 Solar Projects and the Powerline Battery Project. I also listened to, or reviewed the transcription of, the May 2024 depositions in this proceeding of DEF witnesses Goff, Jacob, Anderson and Borsch. Finally, I reviewed the 2023 TYSP and 2024 TYSP of DEF.

Q. BEFORE YOU SUMMARIZE YOUR CONCLUSIONS AND RECOMMENDATIONS, DO YOU HAVE ANY CAVEATS YOU WOULD LIKE TO PUT ON THEM?

A. Yes. The compressed procedural schedule in this proceeding for filing Intervenor testimony has limited the time to complete OPC's investigation into the issues and effects of those issues on the Company's petition. With respect to my

C22-1672

particular review of the Company's petition, direct testimony and exhibits, and responses to discovery, I have been left with two unresolved issues at the time of the filing of this direct testimony.

The first relates to a discrepancy between the peak demand, coincident peak demand and available capacity in DEF's EnCompass® modeling runs versus what is reported in DEF's TYSPs. This discrepancy exists even though there appears to be no similar discrepancy with respect to annual energy.

The second unresolved issue pertains to the lack of a cost-effectiveness analysis, including Cumulative Present Value Revenue Requirement ("CPVRR") benefit to cost ratio and breakeven calculations, for the latest two of the fourteen solar projects DEF has proposed in this proceeding.

Both of these unresolved issues are continuing to be pursued by OPC in discovery of DEF. The results of that additional discovery may lead to one or more changes to my conclusions and recommendations within this testimony. Consequently, it is my understanding that OPC reserves the right to file supplemental testimony to fully address these unresolved issues and the effects of those unresolved issues, if necessary.

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS AND RECOMMENDATIONS.

A. With the caveats I have given, my conclusions and recommendations can be summarized as follows:

- DEF's CCE Projects, 2025-2027 Solar Projects and Powerline Battery Project each provide firm capacity to DEF nearly three years earlier than necessary for resource adequacy and as such are not necessary for reliability at this time;

- Therefore, they are elective rather than mandatory for their projected in-service dates;

- In order for the pursuit of generation-related projects such as these that are elective to be prudent and reasonable, they need to be otherwise shown consistent with providing reliable electric service at lowest reasonable cost;

- This requires a demonstration that the projects are for the purpose of serving DEF's customers – not off-system sales – and that there is a robust, essentially "no regrets," economic case for them;

- The demonstration of a robust economic case is required because DEF's customers do not take service from DEF in order to participate in speculative investments but rather to receive reliable electric service at lowest reasonable cost;

- The demonstration is also necessary to ensure the balance of risk for the subject investments is reasonably balanced between DEF and its customers;

- While the CCE Projects are not necessary for reliability at this time, my review of DEF's cost effectiveness analysis shows these projects are for the purpose of serving DEF's customers and are reasonably forecasted to provide a very robust net benefit such that DEF's decision to pursue them with 2023 through 2026 in-service dates was prudent and reasonable;

- While the 2025-2027 Solar Projects are not necessary for reliability at this time, my review of DEF's cost effectiveness analysis shows that 12 of these 14 projects are for purpose of serving DEF's customers and are reasonably forecasted to provide a robust net benefit such that DEF's decision to pursue these 12 projects with 2025 through 2026 in-service dates was prudent and reasonable;

- There is evidence to suggest the forecasted net benefit for the remaining two 2025-2027 Solar Projects is not robust such that DEF's decision to pursue them may not be prudent and reasonable – additional cost-effectiveness analysis needs to be performed by DEF before it can be found that DEF's decision to pursue them with a projected 2027 in-service date was just and reasonable;

- Until it can be found DEF's decision to pursue the last two 2025-2027 Solar Projects with a 2027 in-service date was prudent and reasonable, DEF's decision with respect to the two projects should be deemed not prudent or reasonable and the projected costs for the two projects be entirely removed from DEF's proposed projected test years in this proceeding;

- The Powerline Battery Project is not necessary for reliability at this time and DEF's cost effectiveness analysis shows that it is not forecasted to provide a robust economic benefit such that there is a significant risk it could result in a net cost rather than a net benefit;

- As a result, DEF's decision to pursue the Powerline Battery Project with a projected 2027 in-service date was not prudent or reasonable;

- Therefore, the projected costs for the Powerline Battery Project should be entirely removed from DEF's proposed projected test years in this proceeding.

II. TIMING OF DEF'S FIRM CAPACITY NEED

Q. PLEASE EXPLAIN HOW YOU REVIEWED THE PRUDENCE, REASONABLENESS AND COST-EFFECTIVENESS OF DEF'S ALREADY INCURRED AND PROJECTED INVESTMENTS FOR ITS CCE PROJECTS, 2025-2027 SOLAR PROJECTS, AND POWERLINE BATTERY PROJECT.

A. I started by examining the timing of DEF's forecasted need for additional firm generation capacity and then examined DEF's forecasted economic performance for each of the investments.

Q. PLEASE EXPLAIN HOW THE TIMING OF DEF'S NEED FOR ADDITIONAL FIRM GENERATION CAPACITY AFFECTS THE PRUDENCE, REASONABLENESS, AND COST-EFFECTIVENESS OF DEF'S PROPOSED INVESTMENTS IN THESE PROJECTS.

A. To the extent the firm generation capacity that would be provided by these projects is actually substantially needed immediately, or nearly immediately, following their entrance to service, there is a demonstrated reliability need for the firm capacity provided by them by the end of DEF's projected test years in this proceeding. Under that scenario, the pursuit of them would be consistent with providing reliable electric service at the lowest reasonable cost to DEF's customers provided the projects have a lower Cumulative Present Value Revenue Requirement ("CPVRR") than other alternatives available to DEF that would provide a similar amount of firm generation capacity at a comparable level of risk.

However, if the firm generation capacity that would be provided by the projects is not substantially immediately needed, or nearly immediately needed, the pursuit of the projects in question by DEF with the timing that DEF has proposed would not necessarily be consistent with providing reliable electric service at lowest reasonable cost even if the investments are projected to provide a lower CPVRR for DEF. This is because there is not a reliability justification for the projects that makes them mandatory. Instead, they are elective. As elective projects, it would need to be demonstrated the projects are in fact for the purpose of serving DEF's customers (i.e., not for the purpose of DEF making off-system sales at wholesale). Furthermore, since projected cost savings would be the principal driver of pursuing these elective projects, it also needs to be demonstrated the projected CPVRR net benefit of the proposed projects, over alternatives to them that have an in-service date consistent with the timing of DEF's firm capacity need, is robust enough such that the investments are not speculative in nature and the balance of risk between DEF and its customers for the investments is reasonable.

Specifically, the economic analysis should exclude off-system sales margins (including any Production Tax Credits ("PTC") enabled by off-system sales), the

C22-1676

benefit to cost ratio for the investment should be robust (ideally 1.25 or higher, but at least 1.15), and a net CPVRR benefit from the investment be projected to be provided to customers no later than half-way through the life of the investment in question and no longer than 10 years after the investment enters service. The first criterion ensures the projects are being cost justified based on serving the load of DEF's customers rather than speculative off-system sales. The latter two criterion ensure the projects are essentially "no regrets" investments for DEF's customers.

Q. WHY IS IT IMPORTANT THAT DEF'S GENERATION OR RESOURCE INVESTMENTS THAT ARE ELECTIVE, BE "NO REGRETS" INVESTMENTS FOR DEF'S CUSTOMERS?

A. It goes to the issues of the purpose of regulated electric service and the balance of risk between a utility and its customers. DEF's customers are not customers of DEF for the purpose of making speculative investments. They are customers of DEF for the purpose of receiving reliable electric service at the lowest reasonable cost. Hence, any elective investments DEF makes to provide that service need to have a low risk and thus have "no regrets" associated with them. With respect to balancing risk, DEF afforded an opportunity to earn its authorized return on the investments through its base rates whether or not the investments actually provide net savings for DEF's customers. Thus, to keep the balance of risk between DEF and its customers reasonable, the investments made by DEF once again must be of the "no regrets" nature.

Q. WHAT IS THE BASIS OF YOUR 1.25 AND 1.15 BENEFIT TO COST RATIO THRESHOLD?

A. MISO requires a 20-year CPVRR Benefit to Cost Ratio of at least 1.25 for transmission projects pursued as Market Efficiency Projects ("MEP"). These are transmission projects that are solely being pursued for economic reasons.[7] PJM Interconnection, LLC ("PJM") uses the same threshold for economic-based transmission enhancements.[8] ERCOT uses a threshold benefit to cost ratio of 1.15 for such projects.

Q. WHY IS IT IMPORTANT FOR AN EARLY CPVRR BREAKEVEN YEAR TO BE MET IN ADDITION TO MEETING A MINIMUM BENEFIT TO COST RATIO?

A. It complements the minimum benefit to cost ratio by addressing the issue of there being less certainty about the future as you go out in time. There is much more risk with a net benefit actually being realized from a project that is not forecasted to provide a net benefit until many years from now versus one that has a forecast net benefit in just a few years.

Q. PLEASE EXPLAIN HOW DEF CURRENTLY DETERMINES ITS FIRM CAPACITY NEED.

A. DEF applies deterministic and probabilistic criteria to ensure it has sufficient firm capacity, and, thus, resource adequacy, to meet its forecasted load under its

[7] MISO Tariff Attachment FF-Transmission Expansion Planning Protocol Section II (B)(e).
[8] PJM Manual 14B: PJM Region Transmission Planning Process.

TYSPs. The *deterministic* criterion that DEF uses is to carry extra summer and winter firm capacity known as Planning Reserve Margin ("PRM") in an amount equal or greater than 20% of the forecasted firm summer and winter demand of its customers. The *probabilistic* criterion that DEF uses is to carry sufficient extra firm summer and winter capacity to ensure the forecasted LOLP for its firm load is no greater than one loss of load event day in 10 years. DEF's reports its approach is to meet both of these criteria and that it has used this dual reliability criteria approach in its annual TYSPs since the early 1990s. However, it also reports that typically the 20% PRM criterion has triggered resource additions for DEF before the LOLP criterion has become a factor and that a probabilistic analysis is periodically performed to ensure the LOLP criterion is satisfied.[9]

Q. HAS DEF PROVIDED ANY INFORMATION WITH RESPECT TO THE MOST RECENT PROBABILISTIC ANALYSIS THAT HAS BEEN PERFORMED?

A. Yes. DEF indicates it has not prepared a utility of Balancing Authority Area ("BAA") specific LOLP study in the last several years. Instead, DEF indicates that because of the high level of integration of the DEF system into the overall Florida Reliability Coordinating Council, Inc. ("FRCC") system, the extensive use of reserve sharing and the existence of a single reliability coordinator for the state, it is more relevant to evaluate LOLP on a state-wide basis and the FRCC does such an analysis every other year in even numbered years.[10] DEF also reports the most recent FRCC

[9] Borsch Direct at 8-9.
[10] DEF Response to LULAC/FR ROG No. 9.

LOLP study from 2022 reported the following forecasted results for the FRCC region as a whole for 2022 through 2026.[11]

TABLE JRD-2

2022 FRCC LOLP Results

Year	Base Case	No Availability of Firm Imports	No Availability of Demand Response	High Case
	LOLP (Days/Year)	LOLP (Days/Year)	LOLP (Days/Year)	LOLP (Days/Year)
2022	0.000003	0.000957	0.015117	0.000008
2023	0.000003	0.000441	0.015003	0.000008
2024	0.000002	0.000652	0.014572	0.000009
2025	0.000004	0.000688	0.010994	0.000011
2026	0.000002	0.000597	0.008826	0.000009

Source: DEF Response to LULAC/FR ROG No. 9

Q. THE RESULTS IN YOUR TABLE JRD-2 ABOVE ARE IN TERMS OF DAYS PER YEAR. WHAT DOES THIS TRANSLATE INTO ON A DAYS IN TEN YEARS BASIS?

A. One event day in ten years translates into a LOLP of 0.1 days per year. Thus, the results in Table JRD-2 indicate the FRCC in its 2022 LOLP Study forecasted LOLPs that range from one event day in 500,000 years (for the Base Case for 2026) to one event day in 66.2 years (for No Availability of Demand Response for 2022). These LOLP values are well, well below the one day in ten years target that is the industry

[11] DEF Response to LULAC/FR ROG No. 9.

standard. This suggests the overall FRCC region has large amounts of excess firm capacity, the 20% PRM criterion used by individual Florida utilities such as DEF is more conservative than necessary, or some combination of the two.

Q. WHAT DOES IT MEAN WITH RESPECT TO THIS PROCEEDING?

A. Given DEF's long history of its 20% PRM criterion driving its firm capacity need rather than LOLP study results, the very low forecasted LOLP values being reported for the FRCC region as a whole by FRCC, and DEF's own statements with respect to the tightly integrated nature of the overall FRCC system that DEF is part of, DEF has no need to carry very much, if any, firm capacity in excess of its 20% PRM to maintain a LOLP less than or equal to one day in ten years. The 20% PRM already provides a very large insurance policy to ensure the industry standard one day in ten years LOLP target is met by DEF.

Q. DOES DEF CALCULATE THE FIRM CAPACITY FOR SOLAR GENERATION FACILITIES AND BATTERY STORAGE FACILITIES IN THE SAME MANNER AS IT DOES FOR ITS CONVENTIONAL GENERATION FACILITIES?

A. No. Since they are always available to provide their summer and winter rated capacity in all hours within the bounds startup, shutdown and ramp rate constraints except when on outage, DEF determines the summer and winter firm capacity of its conventional generation facilities based on the summer and winter rated capability of those facilities. However, since solar generation output depends on the presence, level

C22-1681

and angle of sunshine and battery storage facilities have limited energy available for discharge, DEF derates the summer and winter firm capacity for these resources from the rated capability of these resources. For solar generation, it has performed an analysis that accounts for the shifting of the time of its net peak in summer as it has higher levels of solar generation penetration.[12] Specifically, DEF arrived at the following estimate of summer firm capacity as a percentage of nameplate capacity for new solar resources as a function of total installed solar generation on its system.

TABLE JRD-3

Solar Firmness	Solar Up to MWs
57.0%	1,500
25.0%	2,400
12.5%	3,250
10.0%	5,500

Source: DEF's response to LULAC/FR ROG No. 12

Q. CAN YOU EXPLAIN HOW THIS TABLE WORKS?

A. Yes. The first 1,500 MW of solar generation receives a summer firm capacity of 57% of nameplate. The next 900 MW of solar generation receives a summer firm capacity of 25% of nameplate. Then, the next 850 MW of solar generation receives a summer firm capacity of 12.5% of nameplate, and so on.

[12] The net peak is the peak demand placed on DEF's non-solar resources after accounting for solar generation including retail customer rooftop solar facilities.

Q. HOW MUCH WINTER FIRM CAPACITY IS ASSUMED BY DEF TO BE PROVIDED FROM THE SOLAR GENERATION FACILITIES?

A. None. This is because DEF's forecasted winter peak occurs in darkness.[13]

Q. BASED ON YOUR EXPERIENCE, IS DEF'S APPROACH FOR SOLAR GENERATION UNREASONABLE?

A. Given there is currently very little battery storage capacity or wind generation on the DEF system and the period of interest for this proceeding only involves through 2027 and very shortly thereafter, firm capacity diversity benefits do not need to be considered. Therefore, I cannot say that DEF's approach is an unreasonable approach to properly account for the diminishing value of solar generation toward reducing LOLP during summer periods as the total penetration of solar generation increases.

Q. WHAT APPROACH DOES DEF USE FOR BATTERY STORAGE?

A. Based on a study performed by one of its sister companies in the Carolinas, DEF assumes 90% of nameplate capacity for both summer and winter firm capacity and does so for both two-hour and four-hour storage.

Q. IS THIS A REASONABLE APPROACH?

A. No. A two-hour battery can only provide 50% of its nameplate capacity when discharged over four hours. Given this, DEF should have used a lower percentage of nameplate capacity for two-hour battery facilities, such as its proposed Powerline

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[13] DEF Response to OPC ROG No. 75.

C22-1683

Battery Facility, potentially as low as 45% (half of 90%), given its much lesser ability to sustain a discharge at its nameplate capacity versus four-hour battery facilities. I will address this further when I address the forecasted economics of the Powerline Battery Project later in my testimony.

Q. PLEASE EXPLAIN HOW YOU SPECIFICALLY EXAMINED THE TIMING OF DEF'S NEED FOR ADDITIONAL FIRM CAPACITY.

A. I performed an analysis for both DEF's 2023 and 2024 TYSPs. Specifically, I created a modified version of Schedules 7.1 and 7.2 of DEF's TYSP that backs out the summer and winter firm capacity indicated in Schedule 8 of DEF's TYSP that is associated with the CCE Projects, the 2025-2027 Solar Projects, the Powerline Battery Project and the planned resource placeholders that would later enter service that DEF included in its TYSP but is not seeking approval of in this proceeding. I then delayed DEF's planned 2026-2027 retirement in its TYSP of certain combustion turbine generation facilities by three years. With that baseline established, I identified the year when DEF's need for additional firm capacity to meet its 20% PRM first reaches the amount expected in the TYSP from the CCE Projects, then in the amount expected from the TYSP from the 2025-2027 Solar Projects and then finally the amount expected in the TYSP from the Powerline Battery Project. This order reflects the order of the expected in-service dates of these projects.

The results of this analysis, which is summarized in Exhibits JRD-1 through JRD-4 indicates that the summer drives the need for additional firm capacity. In addition, it shows the firm capacity expected from the CCE Projects is not needed until

C22-1684

2029 and the firm capacity expected from the 2025-2027 Solar Projects and Powerline Battery Project is not needed until 2030. Hence, the results of my analysis is as follows:

- The firm capacity expected from the CCE Projects would not be needed until 2029, nearly three years after the last of them is expected to enter service in 2026;
- The firm capacity expected from the years 2025-2027 Solar projects would not be needed until 2030, nearly three years after the last of the projects is expected to enter service in 2027; and
- The firm capacity expected from the Powerline Battery Project would not be needed until 2030, nearly three years after it is proposed to enter service in 2027.

Given these results, the firm capacity that would be provided from these projects would not be needed for reliability shortly after the projects enter service. They would not be needed for reliability until nearly three years past the respective expected in-service dates of the projects. As such, completion of these projects by their projected in-service dates is not necessary for reliability. Hence, the projects at this time are elective rather than mandatory. Therefore, they must be solely justified on the basis of economics, and, as I have discussed, to ensure the projects are consistent with providing reliable electric service at lowest reasonable cost, their economics need to be based on serving DEF's customers, not on off-system sales, and those economics need to be robust.

Q. PLEASE EXPLAIN WHY YOU PERFORMED YOUR DEF FIRM CAPACITY NEED TIMING ANALYSIS FOR BOTH DEF'S 2023 AND 2024 TYSPs AND NOT JUST DEF'S 2024 TYSP.

A. While DEF's direct testimony and exhibits in this proceeding were dated April 2, 2024, the day after DEF initially filed its 2024 TYSP with the Commission, as evidenced by the economic analysis DEF produced in discovery for the CCE Projects, 2025-2027 Solar Projects, Powerline Battery Project, DEF's 2023 TYSP, and DEF witness Borsch's direct testimony, DEF made its initial decision to pursue the CCE Projects, 2025-2027 Solar Projects, and the Powerline Battery Project prior to the development of DEF's 2024 TYSP. Based on my many years of regulatory experience, my understanding is, under the prudence standard, the reasonableness of actions taken, or not taken, by a utility is reviewed based on information known, or knowable, at the time the decision was made. The reasonableness of a utility's actions, or lack of actions, should be judged in light of the circumstances and facts known, or knowable, at the time that the decision was made. Prudence does not permit "hindsight" review of the actions taken. Thus, for that portion of the Company's costs for the projects that were committed prior to its 2024 TYSP, we need to examine DEF's 2023 TYSP since that was available to DEF's decision makers at that time. This said, the 2024 TYSP is relevant with respect to the costs for the projects DEF has not yet committed to incurring.

Q. PLEASE EXPLAIN WHY YOU INCLUDED A THREE-YEAR DELAY OF DEF'S PLANNED 2026-2027 COMBUSTION TURBINE RETIREMENTS IN YOUR FIRM CAPACITY NEED TIMING ANALYSIS.

A. DEF has indicated it has performed no cost effectiveness analysis for those planned retirements, which total to 524 MW of summer firm capacity in the DEF 2023 TYSP and 460 MW of summer firm capacity in the DEF 2024 TYSP.[14] In addition,

[14] DEF 2023 TYSP at Schedule 8 and Confidential Video-Conference Deposition of Borsch, May 30, 2024, Transcript Volume II at 74:9 through 76:21.

while DEF has indicated there is a significant environmental risk need for the Bayboro portion of these facilities, for the rest of these combustion turbines, DEF indicated the trigger mechanism for their planned retirement is DEF being in a period of relatively high reserve margins.[15] Thus, the planned 2026-2027 retirement of the combustion turbine generation in question is predominantly driven by DEF having excess firm capacity – excess firm capacity contributed to by the proposed CCE Projects, 2025-2027 Solar Projects, and the Powerline Battery Project. Therefore, I conservatively assumed DEF would be able to delay the planned retirement of these combustion turbine generation facilities by at least three years if it needed the firm capacity provided by them.

Q. WHAT IF THE BAYBORO PORTION OF THE PLANNED 2026-2027 COMBUSTION TURBINE RETIREMENTS CANNOT BE DELAYED BY AT LEAST THREE YEARS DUE TO THE ENVIRONMENTAL RISK ASSOCIATED WITH THEM IDENTIFIED BY DEF?

A. At the outset, it is important to note that between its 2023 and 2024 TYSPs, DEF has already shown a willingness to delay the retirement of the Bayboro combustion turbines in question by some amount of time as the planned retirement date for them in the 2023 TYSP was December 2025, while in the 2024 TYSP it is now October 2026.[16] Given this, I believe my three-year retirement delay assumption is reasonably applied to the Bayboro combustion turbine units in question.

[15] Confidential Video-Conference Deposition of Borsch, May 30, 2024, Transcript Volume II at 74:9 through 76:21.
[16] DEF 2023 TYSP and 2024 TYSP at Schedule 8.

This said, I have performed a sensitivity analysis with respect to the timing of DEF's capacity need where the planned retirement of the Bayboro combustion turbine units in question is not delayed by three years. The results of this sensitivity analysis, which are summarized in Exhibits JRD-5 through JRD-8, indicate that, if the planned retirement date of the Bayboro combustion turbines in question cannot be delayed by at least three years, the firm capacity provided by the CCE Projects could be needed by DEF as soon as 2027, the year following the last of them entering service in 2026. However, the firm capacity from the 2025-2027 Solar Projects and Powerline Battery Project would continue to not be needed until 2030 – nearly three years after the last of these projects enter service.

Note the changed result with respect to the timing of the need for the firm capacity that would be provided by the CCE Projects would not change my ultimate conclusion in this direct testimony that DEF's decision to pursue the CCE Projects with 2023 through 2026 in-service dates was prudent and reasonable. It would just strengthen my ultimate conclusion for the CCE Projects since the CCE Projects, in addition to being for the purpose of serving DEF's customers and having a very robust economic case for them as I have found, would now also be needed for reliability purposes very shortly after the last of them enters service.

Q. IS THERE ANY ADDITIONAL EVIDENCE SUPPORTING YOUR CONCLUSION THAT THE FIRM CAPACITY THAT WOULD BE PROVIDED BY THE CCE PROJECTS WILL NOT BE NEEDED UNTIL 2029, THAT THE FIRM CAPACITY THAT WOULD NOT BE NEEDED FROM THE 2025-2027 SOLAR PROJECTS WOULD NOT BE NEEDED UNTIL 2030, AND THAT THE FIRM CAPACITY THAT WOULD BE PROVIDED BY THE POWERLINE BATTERY PROJECT WOULD NOT BE NEED UNTIL 2030?

A. Yes. The alternative projects DEF used in its economic analysis of the CCE Projects would not enter service until 2029 and 2033. The alternative projects DEF used in its economic analysis of the 2025-2027 Solar Projects would not enter service until 2030 and 2032. Finally, the alternative projects DEF used in its economic analysis of the Powerline Battery Project would not enter service until 2030 and 2031.[17]

This further substantiates the conclusion of my analysis above that DEF will not need the firm capacity from the CCE Projects, 2025-2027 Solar Projects and Powerline Battery Project until nearly three years after their respective expected project in-service dates given the alternatives DEF utilized would not enter service until nearly three years after the projects DEF was studying.

[17] DEF Response to LULAC/FR POD No. 2 at Projects tab of '2024 Rate Case CC HR Upgrade Study CPVRR Results.xlsx', '2024 Rate Case Solar Study CPVRR Results.xlsx' and '2024 Rate Case Battery Study CPVRR Results.xlsx'.

Q. PLEASE SUMMARIZE YOUR CONCLUSION WITH RESPECT TO THE ISSUE OF THE TIMING OF DEF'S CAPACITY NEED.

A. The evidence shows that, while DEF uses a combination of deterministic and probabilistic criteria to ensure resource adequacy, in practice its 20% PRM deterministic criterion has alone driven firm capacity additions for DEF. In addition, the FRCC region as a whole has a LOLP of well below the industry standard one event day in 10 years target. As a result, DEF needs very little, if any, firm capacity beyond that necessary to provide it a 20% PRM.

DEF's derate of the rated capability of solar generation when determining the summer and winter firm capacity provided by the same is not unreasonable.

DEF's derate of the rated capability of two-hour battery storage, such as the proposed Powerline Battery project, should be lower than that for four-hour battery storage given only half the rated capability of two-hour battery storage over a four-hour discharge period.

My analysis of DEF's 2023 TYSP and 2024 TYSP shows that DEF does not need the firm capacity that would be provided by its CCE Projects, 2025-2027 Solar Projects and Powerline Battery Projects to meet its 20% PRM criterion for resource adequacy until three years after the respective projected in-service dates of these projects. Given this, they are not required for reliability at the time of their respective in-service dates and thus pursuit of them under their projected in-service dates makes them elective rather than mandatory projects.

For the pursuit of these elective projects to be consistent with providing reliable electric service at lowest reasonable cost, it needs to be shown they will for the purpose

C22-1690

of serving DEF's customers (i.e., not to make off-system sales) and that the economic case for them is robust. A robust economic case needs to be demonstrated because DEF's customers are not customers of DEF for the purpose of participating in speculative investments but rather to obtain reliable electric service at lowest reasonable cost. It also needs to be demonstrated to ensure a reasonable balance of risk between DEF and its customers.

To demonstrate a robust economic case, the projects should ideally have a CPVRR benefit to cost ratio of 1.25 or more, but at least no less than 1.15, versus alternatives (with a comparable level of risk that would not enter service until the year DEF needs firm capacity from them) to help ensure the project will in fact ultimately provide a net benefit to DEF customers. In addition, to further ensure this, the projects should break even on a CPVRR basis versus other alternatives (with a comparable level of risk that would not enter service until the year DEF needs firm capacity from them) within half the design life of the projects and in no case less than 10 years after they enter service. All of this will ensure the projects are "no regrets" projects for the purpose of serving DEF's customers such that they are consistent with providing reliable electric service at the lowest reasonable cost.

III. FORECASTED ECONOMIC PERFORMANCE OF THE CCE PROJECTS

Q. YOU HAVE CONCLUDED THE CCE PROJECTS WITH THEIR PROJECTED IN-SERVICE DATES ARE NOT NECESSARY FOR RELIABILITY AT THIS TIME AND THEREFORE MUST BE SHOWN TO BE FOR THE PURPOSE SERVING DEF'S CUSTOMERS, RATHER THAN FOR OFF-SYSTEM SALES, AND HAVE A ROBUST ECONOMIC CASE. HAS DEF PERFORMED AN ECONOMIC ANALYSIS OF THE CCE PROJECTS?

A. Yes. DEF performed a cost-effectiveness analysis for the CCE Projects. The results of it is presented in DEF witness Borsch's Exhibit BMHB-5. The analysis was conducted in 2022 and utilized EnCompass® along with spreadsheet analysis with respect to estimated capital costs. DEF provided copies of the EnCompass® input and output files in response to OPC POD No. 37 and provided the spreadsheets in response to LULAC/FR POD No. 2. I have reviewed these files.

DEF used a 20-year study period ending in 2041 and compared a case with the CCE Projects added to one that instead principally added a 190 MW combustion turbine generation facility in 2029 and a 100 MW battery storage facility in 2033.[18] In the analysis, DEF forecasts a 20-year CPVRR net benefit of $392.827 million, which consists of forecasted gross CPVRR savings of $505.570 million less a forecasted gross CPVRR cost of $112.743 million.[19] This yields a forecasted 20-year benefit to cost ratio of 4.48, which is very robust. The net benefit is derived approximately 58% from avoided fixed generation costs, approximately 30% from reduced fuel and purchased

[18] DEF Response to LULAC/FR POD No. 2 at Projects tab of '2024 Rate Case CC HR Upgrade Study CPVRR Results.xlsx'.
[19] Borsch Exhibit BMHB-5.

power costs, and approximately 12% from other avoided variable generation costs.[20] Note that while DEF assumed a carbon emission cost in its EnCompass® runs and forecasted a significant carbon emission savings from the CCE Projects based on that cost, DEF has excluded that forecasted amount of savings from its reported forecasted gross savings of $505.570 million and reported a forecasted net benefit of $392.827 million. This is appropriate given there is currently no existing or pending carbon emission tax or cap and trade legislation in Florida or at the federal level. Finally, it should be noted that DEF had negligible off-system sales in both its CCE Projects case and its alternative case. So, the forecasted savings DEF's analysis shows comes from providing service to DEF's customers, not off-system sales.

Q. DID DEF PROVIDE A CPVRR BREAKEVEN CALCULATION IN ITS ANALYSIS?

A. It did not. However, from DEF's spreadsheet files, which included its detailed EnCompass® production cost results, I was able to perform those calculations, which are presented in Exhibit JRD-9. Specifically, the results of DEF's cost effectiveness analysis forecast that the CCE Projects will break even on a CPVRR basis in the second year of the 20-year study period, which is not surprising given the very high forecasted 20-year CPVRR benefit to cost ratio of 4.48.

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[20] Borsch Exhibit BMHB-5.

Q. DID DEF PERFORM ANY SENSITIVITY CASES?

A. It did with respect to different possible variations of the CCE Projects it ultimately pursued, but it did not perform any fuel cost or project cost sensitivities.

Q. IN YOUR OPINION, WOULD A FUEL COST SENSITIVITY CASE BE WARRANTED FOR THE CCE PROJECT ANALYSIS?

A. No. The 2022 vintage natural gas and coal prices used by DEF for its CCE Projects cost effectiveness analysis are lower than those for its 2023 TYSP and using higher fuel prices that the one used by DEF would simply yield a greater forecasted net benefit from the proposed CCE Projects.

Q. HAVE THERE BEEN CHANGES TO THE CCE PROJECTS SINCE THEY WERE STUDIED IN 2022?

A. Yes. There have been modifications to the Hines PB 4 Project such that it is now expected to increase the output of Hines PB4 by 80 MW rather than 52 MW.[21] In addition, the projected heat rate reductions have increased for the Citrus PB 1, Citrus PB 2 and Hines PB 4 CCE Projects.[22] Finally, the estimated capital cost of the CCE projects has increased from $124.9 million to $154.9 million.[23]

[21] Comparing Anderson Exhibit RDA-3 to DEF Response to LULAC/FR POD No. 2 at Assumptions tab of '2024 Rate Case CC Heat Rate Upgrade Study CPVRR analysis.xlsx' and Confidential Deposition of Anderson, May 24, 2024 at response to Late-Filed Deposition Exhibit No. 3.
[22] Comparing Anderson Exhibit RDA-3 to DEF Response to LULAC/FR POD No. 2 at Assumptions tab of '2024 Rate Case CC Heat Rate Upgrade Study CPVRR analysis.xlsx'.
[23] Comparing Anderson Exhibit RDA-3 to DEF Response to LULAC/FR POD No. 2 at CC_Capital_RR tab of '2024 Rate Case CC Heat Rate Upgrade Study CPVRR analysis.xlsx'.

Q. WHAT WOULD BE THE IMPLICATION OF THE GREATER OUTPUT INCREASE FOR HINES PB 4 AND THE INCREASED HEAT RATE REDUCTIONS?

A. Both of these would increase the forecasted gross savings from the CCE Projects versus that forecast by DEF.

Q. ARE ALL OF DEF'S COMBINED CYCLE GENERATION FACILITIES CURRENTLY EXPECTED TO RETIRE BY THE END OF THE 20-YEAR STUDY PERIOD IN 2041?

A. No. For example, the Citrus combined cycle units are assumed to be operational through at least 2058 in DEF's cost effectiveness analysis.

Q. HAVE YOU EXAMINED THE IMPACT IT WOULD HAVE ON THE ECONOMICS OF THE CCE PROJECTS IF THE LATEST CAPITAL COST ESTIMATE FOR THE PROJECTS WAS USED AND THE COMBINED CYCLE UNITS WERE CONSERVATIVELY ASSUMED TO ALL RETIRE BY THE END OF 2041?

A. Yes, I have roughly estimated that impact as a conservative stress test and present it in Exhibit JRD-10. To roughly estimate the impact, I scaled the annual revenue requirement for the original capital cost for the CCE Projects by the ratio of $154.9 million to $124.9 million. Then I added an end effect in 2041 to recover in 2041 the remaining capital cost of CCE Projects that would have been collected from 2042 through 2058. Even under this conservative stress test, the economics for the

C22-1695

CCE Projects are still very robust with a 20-year CPVRR benefit to cost ratio of 3.27 and a CPVRR breakeven in the 3rd year of the 20-year study period.

Q. WHAT IS YOUR CONCLUSION WITH RESPECT TO THE CCE PROJECTS?

A. While the CCE Projects are elective rather than mandatory in nature, they are consistent with providing reliable electric service at lowest reasonable cost because their economic justification is based on serving DEF's customers and the projected net economic benefit from the CCE projects is very robust. Therefore, based on my analysis and what I am aware of as the filing date of this testimony, I cannot say that DEF's decision to pursue to CCE Projects was imprudent or unreasonable.

IV. FORECASTED ECONOMIC PERFORMANCE OF 2025-2027 SOLAR PROJECTS

Q. LIKE WITH THE CCE PROJECTS, YOU HAVE CONCLUDED THE 2025-2027 SOLAR PROJECTS WITH THEIR PROJECTED IN-SERVICE DATES ARE NOT NECESSARY FOR RELIABILITY AT THIS TIME AND THEREFORE MUST BE SHOWN TO BE FOR THE PURPOSE OF SERVING DEF'S CUSTOMERS, RATHER THAN OFF-SYSTEM SALES, AND HAVE A ROBUST ECONOMIC CASE. HAS DEF PERFORMED AN ECONOMIC ANALYSIS OF THE 2025-2027 SOLAR PROJECTS?

A. Yes. As with the CCE Projects, DEF performed a cost-effectiveness analysis for the 2025-2027 Solar Projects. The results of this analysis with all 14 of the 2025-2027 Solar Projects pursued, is presented in DEF witness Borsch's Exhibit BMHB-3-Amended. In addition, the results of the analysis with only the first five of the fourteen

C22-1696

2025-2027 Solar Projects being pursued is presented in DEF witness Borsch's Exhibit BMHB-4-Amended.

Q. WHY DID DEF PERFORM A VERSION OF THE ANALYSIS WITH ONLY FIVE OF THE PROJECTS PURSUED?

A. DEF is proposing to pursue the first five of the fourteen 2025-2027 Solar Projects as an expansion of its Clean Energy Connection ("CEC") voluntary community solar program rather than as normal DEF generation projects. DEF witness Borsch in his direct testimony presents the analysis of the five projects alone to show they are cost-effective.[24] However, DEF has indicated, and I have confirmed from my review of DEF's Encompass® input and output files provided in response to OPC's Fourth Request for Production, No. 37 and the relevant spreadsheet files provided in response to LULAC/FR First Request for Production, No. 2, that there is no difference in how the five projects proposed to be an expansion of the DEF CEC program are modeled in the cost-effectiveness analysis versus the other nine of the fourteen 2025-2027 Solar Projects.[25] As a result, the analysis presented by DEF in DEF witness Borsch's Exhibit BMHB-4-Amended does not present any information with respect to the benefit of expanding DEF's CEC program. Rather, it indicates DEF's forecasted cost-effectiveness of pursuing the five projects alone as normal DEF generation projects.

[24] Borsch Direct at 18-20.
[25] Confidential Video-Teleconference Deposition of Borsch, May 30, 2024, Transcript Volume II at 106:24 through 108:12.

Q. HAVE YOU MADE ANY EVALUATION OF THE REASONABLENESS OF DEF'S PROPOSAL TO EXPAND ITS CEC PROGRAM?

A. No, that goes beyond the scope of my analysis and direct testimony in this proceeding. I have not examined the issue and as a result have not developed an opinion on that question for this testimony.

Q. WAS THE COST EFFECTIVENESS ANALYSIS THAT DEF PERFORMED FOR THE 2025-2027 SOLAR PROJECTS PERFORMED IN THE SAME MANNER AS DEF'S COST EFFECTIVENESS ANALYSIS FOR ITS CCE PROJECTS?

A. It was generally performed in the same manner, but there are some important differences. Specifically, it was different in the following respects:

- The analysis was performed in 2023 using DEF's 2023 TYSP assumption including its 2023 TYSP base case fuel price assumptions.[26]
- DEF used a study period that ends in 2057, rather than 2041, based on the last of 2025-2027 Solar Projects entering service in 2027 and an assumed design life for the projects of 30 years.[27]
- The principal assumed alternative resources for the 2025-2027 Solar projects consisted of a 190 MW combustion turbine generation facility added in 2030 and a four-hour 50 MW battery added in 2032.[28]
- DEF included PTCs for the projects under the Inflation Reduction Act ("IRA") assuming it could fully realize 90% of their value in 2025, 2026, and 2027 and 100% of their value thereafter.[29]

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[26] Borsch Direct at 10 and 18 and DEF's response to OPC ROG No. 74.
[27] Borsch Direct at 17; DEF 2023 and 2024 TYSPs at Schedule 9; Confidential Deposition of Goff, May 29, 2024, p. 91, lines 4-5; DEF Response to LULAC/FR DOD No. 2 at Solar14_RR tab of '2024 Rate Case Solar Study_14_Solar.xlsx'.
[28] DEF Response to LULAC/FR POD No. 2 at Projects tab of '2024 Rate Case Solar Study CPVRR Results.xlsx'.
[29] Panizza Direct at 9 and DEF Response to LULAC/FR POD No. 2 at PTC tab of '2024 Rate Case Solar Study_14_Solar.xlsx'.

C22-1698

- DEF assumed no cost for carbon emissions.

Q. WHAT WERE THE RESULTS OF DEF'S COST EFFECTIVENESS ANALYSIS?

A. As detailed in DEF witness Borsch's Exhibit BMHB-3-Amended, if all 14 of the 2025-2027 Solar Projects are pursued as proposed by DEF, DEF forecasts a CPVRR net benefit of approximately $552 million, which consists of gross CPVRR savings of approximately $2.478 billion less gross CPVRR costs of approximately $1.925 billion. This amounts to a forecasted 35-year CPVRR benefit-to-cost ratio of approximately 1.29. The gross CPVRR savings is driven approximately 20.1% by avoided fixed generation and transmission costs, approximately 25% by forecasted realized PTCs from the projects, approximately 48.0% by reduced fuel cost and approximately 6.7% by other reduced variable generation costs.[30]

If only the first five of the fourteen 2025-2027 Solar Projects are pursued, as detailed in DEF witness Borsch's Exhibit BMHB-4-Amended, DEF forecasts a CPVRR net benefit of approximately $313 million, which consists of gross CPVRR savings of approximately $1.029 billion less gross CPVRR costs of approximately $716 million. This amounts to a forecasted CPVRR benefit to cost ratio of approximately 1.44. The gross CPVRR savings is driven approximately 28.0% by avoided fixed generation and transmission costs, approximately 21.9% by forecasted realized PTCs from the projects, approximately 44.3% by reduced fuel costs and approximately 5.8% by reductions in other variable generation costs.[31]

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[30] Borsch Exhibit BMHB-3-Amended.
[31] Borsch's Exhibit BMHB-3-Amended.

Q. DID DEF IN ITS COST-EFFECTIVENESS ANALYSIS REVIEW OTHER COMBINATIONS OF SOLAR PROJECTS FOR 2025-2027 BESIDES PURSUIT OF ALL 14 PROJECTS OR JUST THE FIRST FIVE?

A. No. However, it is possible to estimate the incremental economic benefit of the last nine projects from the difference between the DEF results for pursuing all 14 of the projects versus the DEF results for just pursuing the first five projects.

Q. HAVE YOU DONE SO?

A. Yes, I have done so in Exhibit JRD-11. As can be seen from Exhibit JRD-11, the last nine projects incrementally only have a forecasted CPVRR net benefit of approximately $240 million, which consists of gross CPVRR savings of approximately $1.449 billion less gross CPVRR costs of approximately $1.209 billion. This amounts to a forecasted benefit to cost ratio of approximately 1.20, significantly less than the 1.44 for the first five of the 14 projects. The gross CPVRR savings are driven approximately 14.6% by avoided fixed generation and transmission costs, approximately 27.3% by forecasted realized PTCs from the projects, approximately 50.6% by reduced fuel costs and by approximately 7.4% by reductions in other variable generation costs. What is noteworthy is that the contribution from avoided fixed generation and transmission costs is only 14.6% for the last nine projects versus 28.0% for the first five projects. This may be driven by a lower summer firm capacity percentage for the latest of the 2025-2027 Solar Projects versus the earliest of the 2025-2027 Solar Projects.

Q. DOES THIS DECLINING BENEFIT-TO-COST RATIO PERFORMANCE GIVE YOU A CONCERN?

A. Yes. These results suggest the last two to three of the 2025-2027 Solar Projects may not have a robust economic case for them. For example, in the table below, I apply the average results for the first five projects and last nine projects linearly to provide a rough ballpark estimate of how the benefit-to-cost ratio for the individual projects may decline for new projects as they are added.

TABLE JRD-4

Rough Ballpark Estimate of Potential
B to C Ratio Decline 2025-2027 Solar Projects

Project #	Potential B to C Ratio
1	1.51
2	1.47
3	1.44
4	1.41
5	1.37
6	1.34
7	1.30
8	1.27
9	1.23
10	1.20
11	1.17
12	1.13
13	1.10
14	1.06

While the actual behavior may not be linear as shown above, the above table is illustrative with respect to showing that the last couple of 2025-2027 solar projects may not have robust economics particularly since they may have the lowest summer firm capacity percentage.

C22-1701

Q. HOW CAN THIS ISSUE BE RESOLVED?

A. It can be resolved by performing a cost-effectiveness analysis for the last two of the fourteen 2025-2027 Solar Projects with the previous twelve already added. OPC has in discovery requested DEF to perform that analysis.

Q. DID DEF PERFORM A CPVRR BREAKEVEN CALCULATION FOR THE 2025-2027 SOLAR PROJECTS?

A. No. However, from the spreadsheets for DEF's cost-effectiveness analysis provided in response to LULAC/FR POD No. 2, I was able to perform the calculations for pursuit of all 14 of the projects. This is presented in my Exhibit JRD-12. I found that DEF's cost-effectiveness analysis forecasts a CPVRR breakeven for pursuit of all 14 of the 2025-2027 Solar Project by the tenth year of 35-year study period. This is less than halfway through the assumed 30-year design life of the projects and within ten years of the last of the projects entering service.

Q. HAVE THERE BEEN CHANGES TO THE PROJECTS SINCE THEY WERE STUDIED IN 2023 THAT WOULD MATERIALLY AFFECT THE RESULTS OF DEF'S COST EFFECTIVENESS ANALYSIS?

A. Yes. The estimated total projected cost of the 2025-2027 Solar Projects has increased from approximately $1.604 billion to approximately $1.663 billion.[32]

[32] Confidential DEF Response to OPC ROG No. 186 at 20240025-OPCROG7-00018141.

Q. CAN THE IMPACT OF THE ABOVE ON DEF'S COST EFFECTIVENESS ANALYSIS BE ROUGHLY ESTIMATED?

A. Yes. I have done so in Exhibit JRD-9 for the pursuit of all 14 projects by scaling the annual revenue requirement for the generation and transmission capital expenditures for the projects by the ratio of 1.663 to 1.604 (1.037:1). The results of Exhibit JRD-13 forecast, under DEF's cost estimate for the projects at the time of the filing of this testimony, a CPVRR net benefit of $487 million consisting of gross CPVRR savings of $2.477 billion less gross CPVRR costs of $1,991 billion. This provides a forecasted benefit to cost ratio of 1.24 for the projects over the 35-year study period. The results also show a forecasted CPVRR breakeven in the 11th year of the 35-year study period, which is within 10 years of the last of the projects entering service.

Q. DID DEF PERFORM ANY FUEL COST SENSITIVITIES IN ITS COST EFFECTIVENESS ANALYSIS FOR THE 2025-2027 SOLAR PROJECTS?

A. It did not. It indicates it did not because, based on its examination its of its 2023 TYSP base, high and low fuel scenarios, it would not produce materially different results.[33]

Q. DO YOU AGREE?

A. Yes. I performed a very rough estimate of the potential impact of using DEF's low fuel forecast scenario and found it only slightly affected the forecasted benefit to

[33] DEF Response to OPC ROG No. 74.

cost ratio of 2025-2027 Solar Projects, by dropping it from 1.24 to 1.23. I performed the very rough estimate by scaling total annual coal and natural gas costs from DEF's EnCompass® production cost runs for the cost effectiveness analysis by the ratio the low case to base case 2023 TYSP coal and natural gas prices. This rough estimate, which included the now higher estimated capital cost of the projects, is provided in Exhibit JRD-14.

Q. WHAT IS YOUR CONCLUSION WITH RESPECT TO THE 2025-2027 SOLAR PROJECTS?

A. At the time of the filing of this direct testimony, I am concerned there is not a robust economic case for the last two of the fourteen 2025-2027 Solar Projects, and this weakness is dragging the overall economics of the fourteen 2025-2027 Solar Projects down near below robust economic territory especially when updated capital cost estimates are applied. Given this, I cannot at this time conclude DEF's decision to pursue the last two of the fourteen 2025-2027 Solar Projects was prudent and reasonable. I reserve the right to file supplemental testimony if DEF completes the additional cost effectiveness analysis, including CPVRR benefit to cost ratio and break even calculations, that OPC has requested once I have reviewed those results with respect to the question of whether DEF's decision to pursue the last two projects was not imprudent or unreasonable.

With respect to the first twelve of the fourteen 2025-2027 Solar Projects, while they are elective rather than mandatory, they are consistent with providing reliable electric service at lowest reasonable cost because their economic justification is based on serving DEF's customers and the projected net economic benefit from them is robust. Therefore, based on my analysis, and what I am aware of at the time of filing this testimony, I cannot say that DEF's decision to pursue the first twelve of the fourteen 2025-2027 Solar Projects was imprudent or unreasonable.

V. FORECASTED ECONOMIC PERFORMANCE OF POWERLINE BATTERY PROJECT

Q. LIKE WITH THE CCE PROJECTS AND THE 2025-2027 SOLAR PROJECTS, YOU HAVE CONCLUDED THE POWERLINE BATTERY PROJECT WITH ITS PROJECTED IN-SERVICE DATE IS NOT NECESSARY FOR RELIABILITY AT THIS TIME AND THEREFORE MUST BE SHOWN TO BE FOR THE PURPOSE OF SERVING DEF'S CUSTOMERS, RATHER THAN OFF-SYSTEM SALES, AND HAVE A ROBUST ECONOMIC CASE. HAS DEF PERFORMED ON ECONOMIC ANALYSIS OF THE POWERLINE BATTERY PROJECT?

A. Yes. As with the CCE Projects and the 2025-2027 Solar Projects, DEF performed a cost-effectiveness analysis of the proposed Powerline Battery Project. The results of this analysis are presented in DEF witness Borsch's Exhibit BMHB-6-Amended. The analysis was performed with and without an extra 10% ITC for the project being located in an Energy Community as defined under the IRA.

Q. WAS THE COST-EFFECTIVENESS ANALYSIS THAT DEF PERFORMED FOR THE POWERLINE BATTERY PROJECT PERFORMED IN THE SAME MANNER AS THAT FOR THE 2025-2027 SOLAR PROJECTS?

A. In general it was, but there are a few differences. First, the Powerline Battery Project only has an assumed design life of 15 years such that the total study period is only 19 years. Second, ITCs under the IRA are modeled rather than PTCs since batteries are not eligible for PTCs. Third, the alternative DEF analyzed was a 50 MW four-hour battery added in 2030 and another 50 MW four-hour battery added in 2031.[34] Finally, DEF in Exhibit BMHB-6-Amended lumped the capital cost of the Powerline Battery Project into the change of other generation and transmission capital costs. While the Powerline Battery Project cost is still separately derivable from Exhibit BMHB-6-Amended, it is inconsistent with DEF's presentation in Exhibit BMHB-3-Amended, Exhibit BMHB-4-Amended and Exhibit BMHB-5.

Q. WHAT DOES DEF'S POWERLINE BATTERY PROJECT COST-EFFECTIVENESS ANALYSIS INDICATE?

A. As detailed in DEF witness Borsch's Exhibit BMHB-6-Amended, it indicates that without the extra 10% ITC, the Powerline Battery Project would have a forecasted CPVRR net cost of $5.04 million rather than a forecast CPVRR benefit. With the additional 10% ITC, Exhibit BMHB-6-Amended forecasts a CPVRR net benefit of approximately $3.88 million, which consists of gross CPVRR saving of approximately $143.93 million less gross CPVRR costs of $140.06 million. This amounts to a

[34] DEF Response to LULAC/FR POD No. 2 at Projects tab of '2024 Rate Case Battery Study CPVRR Results.xlsx'.

CPVRR benefit to cost ratio of only 1.03. Note there is no forecasted fuel cost savings. The gross CPVRR savings is being driven approximately 95.6% by avoided fixed generation at transmission costs and 4.3% by variable generation costs unrelated to fuel.

Q. DID DEF PERFORM A CPVRR BREAKEVEN CALCULATION FOR THE POWERLINE BATTERY PROJECT?

A. No. However, from the spreadsheets for DEF's cost-effectiveness analysis provided in response to LULAC/FR POD No. 2, I was able to perform the calculations for Powerline Battery Project. This is presented in my Exhibit JRD-15. I found that even with the additional 10% ITC, DEF's cost effectiveness analysis does not forecast a CPVRR breakeven for the Powerline Battery Project until the 18th year of the 19 year study period – the second to last year of the assumed design life of the battery and well after ten years from when the battery would enter service.

Q. GIVEN THESE RESULTS, WHAT DO YOU CONCLUDE WITH RESPECT TO THE POWERLINE BATTERY PROJECT?

A. The Powerline Battery Project is not needed for reliability at this time and it does not have a robust forecasted CPVRR net benefit. Also, even the forecasted 1.03 CPVRR benefit to cost ratio with the additional 10% ITC is likely overstated as DEF has problematically assumed the same firm capacity percentage from nameplate for two-hour battery as it has for four-hour batteries. Given all this, pursuit of the Powerline Battery Project at this time is not prudent or reasonable because its pursuit at this time is not consistent with providing reliable electric service at lowest reasonable cost. Its costs should be entirely removed from DEF's projected test years in this proceeding.

Q. DEF WITNESS BORSCH IN HIS DIRECT TESTIMONY SUGGESTS THE ECONOMIC SHORTFALL FOR THE POWERLINE BATTERY PROJECT MIGHT BE OVERCOME BY THE PROJECT ALLOWING THE AVOIDANCE OF SOLAR GENERATION OUTPUT CURTAILMENT FOR SOME HOURS NOT WELL-REPRESENTED IN THE ENCOMPASS® MODELING. HE INDICATES THIS AVOIDED SOLAR GENERATION OUTPUT CURTAILMENT MIGHT AMOUNT TO AS MUCH AS 30 HOURS PER YEAR AT THE RATED CAPABILITY OF THE BATTERY OVER THE LIFE OF THE BATTERY.[35] HOW DO YOU RESPOND?

A. It is a highly speculative argument and should be rejected by the Commission. The EnCompass® model already captures the dollar benefit of avoided solar generation output curtailments at the hourly level of granularity. While it is possible for there to be some solar generation output curtailment avoidance that is not captured by the EnCompass® model particularly at the sub-hourly level, there is no evidence it would amount to anything near 30 hours per year at the rated capability of the battery over the life of the battery.

[35] Borsch Direct at 23-24.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

C22-1709

Qualifications of James R. Dauphinais

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. James R. Dauphinais. My business address is 16690 Swingley Ridge Road, Suite 140, Chesterfield, MO 63017, USA.

Q. PLEASE STATE YOUR OCCUPATION.

A. I am a consultant in the field of public utility regulation and a Managing Principal with the firm of Brubaker & Associates, Inc. ("BAI"), energy, economic and regulatory consultants.

Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND EXPERIENCE.

A. I graduated from Hartford State Technical College in 1983 with an Associate's Degree in Electrical Engineering Technology. Subsequent to graduation, I was employed by the Transmission Planning Department of the Northeast Utilities Service Company[1] as an Engineering Technician.

While employed as an Engineering Technician, I completed undergraduate studies at the University of Hartford. I graduated in 1990 with a Bachelor's Degree in Electrical Engineering. Subsequent to graduation, I was promoted to the position of Associate Engineer. Between 1993 and 1994, I completed graduate level courses in the study of power system analysis, power system transients and power system protection

[1] In 2015, Northeast Utilities changed its name to Eversource Energy.

C22-1710

through the Engineering Outreach Program of the University of Idaho. By 1996 I had been promoted to the position of Senior Engineer.

In the employment of the Northeast Utilities Service Company, I was responsible for conducting thermal, voltage and stability analyses of the Northeast Utilities' transmission system to support planning and operating decisions. This involved the use of load flow, power system stability and production cost computer simulations. It also involved examination of potential solutions to operational and planning problems including, but not limited to, transmission line solutions and the routes that might be utilized by such transmission line solutions. Among the most notable achievements I had in this area include the solution of a transient stability problem near Millstone Nuclear Power Station, and the solution of a small signal (or dynamic) stability problem near Seabrook Nuclear Power Station. In 1993 I was awarded the Chairman's Award, Northeast Utilities' highest employee award, for my work involving stability analysis in the vicinity of Millstone Nuclear Power Station.

From 1990 to 1996, I represented Northeast Utilities on the New England Power Pool Stability Task Force. I also represented Northeast Utilities on several other technical working groups within the New England Power Pool ("NEPOOL") and the Northeast Power Coordinating Council ("NPCC"), including the 1992-1996 New York-New England Transmission Working Group, the Southeastern Massachusetts/Rhode Island Transmission Working Group, the NPCC CPSS-2 Working Group on Extreme Disturbances and the NPCC SS-38 Working Group on Interarea Dynamic Analysis. This latter working group also included participation from a number of ECAR, PJM and VACAR utilities.

From 1990 to 1995, I also acted as an internal consultant to the Nuclear Electrical Engineering Department of Northeast Utilities. This included interactions with the electrical engineering personnel of the Connecticut Yankee, Millstone and Seabrook nuclear generation stations and inspectors from the Nuclear Regulatory Commission ("NRC").

In addition to my technical responsibilities, from 1995 to 1997, I was also responsible for oversight of the day-to-day administration of Northeast Utilities' Open Access Transmission Tariff. This included the creation of Northeast Utilities' pre-FERC Order No. 889 transmission electronic bulletin board and the coordination of Northeast Utilities' transmission tariff filings prior to and after the issuance of Federal Energy Regulatory Commission ("FERC" or "Commission") FERC Order No. 888. I was also responsible for spearheading the implementation of Northeast Utilities' Open Access Same-Time Information System and Northeast Utilities' Standard of Conduct under FERC Order No. 889. During this time, I represented Northeast Utilities on the Federal Energy Regulatory Commission's "What" Working Group on Real-Time Information Networks. Later I served as Vice Chairman of the NEPOOL OASIS Working Group and Co-Chair of the Joint Transmission Services Information Network Functional Process Committee. I also served for a brief time on the Electric Power Research Institute facilitated "How" Working Group on OASIS and the North American Electric Reliability Council facilitated Commercial Practices Working Group.

In 1997 I joined the firm of Brubaker & Associates, Inc. The firm includes consultants with backgrounds in accounting, engineering, economics, mathematics, computer science and business. Since my employment with the firm, I have filed or presented testimony before the Federal Energy Regulatory Commission in Consumers Energy Company, Docket No. OA96-77-000; Midwest Independent Transmission System Operator, Inc., Docket No. ER98-1438-000; Montana Power Company, Docket No. ER98-2382-000; Inquiry Concerning the Commission's Policy on Independent System Operators, Docket No. PL98-5-003; SkyGen Energy LLC v. Southern Company Services, Inc., Docket No. EL00-77-000; Alliance Companies, et al., Docket No. EL02-65-000, et al.; Entergy Services, Inc., Docket No. ER01-2201-000; Remedying Undue Discrimination through Open Access Transmission Service, Standard Electricity Market Design, Docket No. RM01-12-000; Midwest Independent Transmission System Operator, Inc., Docket No. ER10-1791-000; NorthWestern Corporation, Docket No. ER10-1138-001, et al.; Illinois Industrial Energy Consumers v. Midcontinent Independent System Operator, Inc., Docket No. EL15-82-000; Midcontinent Independent System Operator, Inc., Docket No. ER16-833-000; Midcontinent Independent System Operator, Inc., Docket No. ER17-284-000; and Midcontinent Independent System Operator, Inc. and Ameren Services Company Docket No. ER18-463-000. I have also filed or presented testimony before the Alberta Utilities Commission, the California Public Utilities Commission, the Colorado Public Utilities Commission, the Connecticut Department of Public Utility Control, the Florida Public Service Commission, the Idaho Public Service Commission, the Illinois Commerce Commission, the Indiana Utility Regulatory Commission, the Iowa Utilities Board, the Kentucky Public Service Commission, the Louisiana Public Service Commission, the Michigan Public Service Commission, the Missouri Public Service Commission, the Montana Public Service Commission, the Nevada Public Utilities

Commission, the New Mexico Public Regulation Commission, the Council of the City of New Orleans, the Oklahoma Corporation Commission, the Public Utility Commission of Texas, the Virginia State Corporation Commission, the Wisconsin Public Service Commission, the Wyoming Public Service Commission, Federal District Court and various committees of the Illinois, Missouri and South Carolina state legislatures. This testimony has been given regarding a wide variety of issues including, but not limited to, ancillary service rates, avoided cost calculations, certification of public convenience and necessity, class cost of service, cost allocation, fuel adjustment clauses, fuel costs, generation interconnection, interruptible rates, market power, market structure, off-system sales, prudency, purchased power costs, resource adequacy, resource planning, rate design, retail open access, standby rates, transmission losses, transmission planning, transmission rates and transmission line routing.

I have also participated on behalf of clients in the Southwest Power Pool Congestion Management System Working Group, the Alliance Market Development Advisory Group and several committees and working groups of the Midcontinent Independent System Operator, Inc. ("MISO"), including the Congestion Management Working Group; Economic Planning Users Group; Loss of Load Expectation Working Group; Market Subcommittee; Michigan Transmission Studies Task Force; Planning Subcommittee; Regional Expansion, Criteria and Benefits Working Group; Resource Adequacy Subcommittee (formerly the Supply Adequacy Working Group); and Reliability Subcommittee. I am currently a member of the MISO Advisory Committee in the end-use customer sector on behalf of industrial customer groups in Illinois,

C22-1714

Louisiana, Michigan and Texas. I am also the past Chairman of the Issues/Solutions Subgroup of the MISO Revenue Sufficiency Guarantee ("RSG") Task Force.

In 2009, I completed the University of Wisconsin-Madison High Voltage Direct Current ("HVDC") Transmission course for Planners that was sponsored by MISO. I am a member of the Power and Energy Society ("PES") of the Institute of Electrical and Electronics Engineers ("IEEE").

In addition to our main office in St. Louis, the firm also has branch offices in Corpus Christi, Texas; Louisville, Kentucky; and Phoenix, Arizona.

C22-1715

(Whereupon, prefiled direct testimony of David E. Dismukes was inserted.)

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In Re: Petition for rate increase by Duke Energy Florida, LLC. ______________________________ /	Docket No. 20240025-EI FILED: June 11, 2024

DIRECT TESTIMONY

OF

DAVID E. DISMUKES, PH.D.

ON BEHALF

OF

THE CITIZENS OF THE STATE OF FLORIDA

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of the State of Florida

C23-1757

TABLE OF CONTENTS

C23-1758

I. INTRODUCTION

Q. WOULD YOU PLEASE STATE YOUR NAME AND BUSINESS ADDRESS?

A. My name is David E. Dismukes. My business address is 5800 One Perkins Place Drive, Suite 5-F, Baton Rouge, Louisiana, 70808.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?

A. I am testifying in this proceeding on behalf of the Florida Office of Public Counsel ("OPC").

Q. WOULD YOU PLEASE STATE YOUR OCCUPATION AND CURRENT PLACE OF EMPLOYMENT?

A. I am a Consulting Economist with the Acadian Consulting Group ("ACG"), a research and consulting firm that specializes in the analysis of regulatory, economic, financial, accounting, statistical, and public policy issues associated with regulated and energy industries. ACG is a Louisiana-registered partnership, formed in 1995, and is located in Baton Rouge, Louisiana.

Q. DO YOU HOLD ANY ACADEMIC POSITIONS?

A. Yes. I am a professor emeritus at Louisiana State University ("LSU"). Prior to my retirement in January 2023, I served as a full professor, executive director, and director of policy analysis at the LSU Center for Energy Studies and as a full tenured professor in the Department of Environmental Sciences and the director of the Coastal Marine Institute in

C23-1759

the LSU College of the Coast and Environment. I also serve as a senior fellow at the Institute of Public Utilities at Michigan State University, where I have taught energy regulatory staff and other utility stakeholders about principles, trends, and issues in the electric and natural gas industries. I am also a Distinguished Fellow and Senior Economist with the Institute for Energy Research in Washington, D.C. Appendix A provides my academic curriculum vitae, which includes a full listing of my publications, presentations, pre-filed expert witness testimony, expert reports, expert legislative testimony, and affidavits.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. I have been retained by the OPC to provide an expert opinion to the Florida Public Service Commission ("the Commission") on load forecasting, multi-year rate increases, and energy affordability issues and how these topics relate to the current base rate case increase proposed by Duke Energy Florida ("DEF" or "the Company"). My testimony and accompanying exhibits have been prepared by me or those under my direction and control.

Q. ARE YOU SPONSORING ANY EXHIBITS?

A. Yes. The following exhibits have been prepared in support of my testimony:

- Exhibit DED-1: Base Revenue Impact,
- Exhibit DED-2: Out-of-Model Adjustments,
- Exhibit DED-3: Company Energy Sales and Customer Forecasts,
- Exhibit DED-4: Revised Sales Forecast based on Ten-Year Trend,
- Exhibit DED-5: Usage per Customer Utility Survey,

- Exhibit DED-6: Rate Case Forecast Compared to Ten-Year Site Plan,
- Exhibit DED-7: Impact of Alternative Regulation for Retail Ratepayers in Florida
- Exhibit DED-8: Energy Affordability Index.

Q. HOW IS THE REMAINDER OF YOUR TESTIMONY ORGANIZED?

A. My testimony is organized into the following sections:

- Section II: Summary of Recommendations
- Section III: Load Forecast
- Section IV: Multi-Year Rate ("MYR") Increase
- Section V: Energy Affordability
- Section VI: Conclusions and Recommendations

Q. ARE YOU AWARE OF ANY FILINGS MADE BY THE COMPANY THAT WOULD ADJUST INFORMATION IN ITS INITIAL RATE CASE FILING?

A. I am aware that late in the afternoon of June 6, 2024, five calendar days before Intervenor Testimony was due and after denying in depositions that material corrections would be made until closer to hearing (if at all), the Company filed a Notice of Identified Adjustments. The information in this notice may have an effect on my analysis and recommendations. However, at the stage my testimony was in at that time of receipt of this notice, it was impossible to reconcile the notice with the filing and extensive discovery. I will review the Notice of Identified Adjustments, and, if warranted, file supplemental testimony incorporating the impact.

II. SUMMARY OF RECOMMENDATIONS

Q. PLEASE SUMMARIZE YOUR LOAD FORECAST RECOMMENDATION.

A. I recommend the Commission reject the Company's energy sales forecast because it bears no resemblance to historic trends and is biased due to the introduction of a number of subjective and non-documented out-of-model adjustments. Additionally, by the Company's own admission, the input data in the rate case model originates from the outdated spring forecast instead of the Company's more recent fall forecast.[1] I recommend the Commission accept a modified version of the Company's more recent fall forecast that removes subjective and non-documented out-of-model adjustments. The use of the fall forecast instead of the spring forecast will increase the Company's test year megawatt-hour sales forecast by 698,255 in 2025; 632,169 in 2026; and 789,322 in 2027. The removal of out-of-model adjustments from the fall forecast will increase the Company's test year megawatt-hour sales forecast by an additional 579,466 in 2025; 873,257 in 2026; and 1,107,452 in 2027. The result is a new megawatt-hour sales projection of 41,076,721 in 2025; 41,432,426 in 2026; and 41,853,774 in 2027. Overall, the change in forecast (spring to fall) accounts for 45 percent of my proposed load forecast change while the removal of the out-of-model adjustments accounts for the remaining difference between the Company's proposed forecast and my own.

[1] Company Response to Staff's First Set of Interrogatories, No. 2.

C23-1762

Q. PLEASE SUMMARIZE THE REVENUE IMPACTS RESULTING FROM YOUR LOAD FORECAST RECOMMENDATION.

A. My recommendation will result in an increase in total proposed (filed) test year retail revenues of $94 million in 2025; $110 million in 2026; and $136 million in 2027. On a revenue basis, my proposed changes to update the forecast account for 46 percent of the change in total test year revenues (2025 through 2027), while the remaining 54 percent accounts for the total change attributable to the removal of the out-of-model adjustments. I consider this to be a conservative recommendation considering a forecast aligned with the Company's ten-year historical trend would result in a $142 million increase in 2025; $166 million increase in 2026; and $196 million increase in 2027. A summary of these forecasted revenues is provided in Exhibit DED-1.

Q. PLEASE SUMMARIZE YOUR MULTI-YEAR RATE INCREASE RECOMMENDATION.

A. I recommend the Commission reject the Company's requests for subsequent rate increases in 2026 and 2027, and instead only allow for a single rate adjustment in 2025 – if otherwise justified. The Company's testimony and exhibits contain no analysis or support that multi-year rate increases have provided any ratepayer benefits or will result in any *bona fide* and measurable public benefits. My review of multi-year rate cases and other forms of alternative regulation around the U.S. has found that these forms of regulation lead to higher rates, little to no efficiency benefits, and less capital spending discipline.

Q. PLEASE SUMMARIZE YOUR FINDINGS REGARDING ENERGY AFFORDABILITY IN THE COMPANY'S SERVICE TERRITORY.

A. Energy affordability remains a challenging issue around the U.S. as well as in the Company's service territory. DEF-specific electricity costs as a share of income remain unaffordable for the Company's low-income customers. Continued multi-year rate increases will do nothing to improve the affordability of electricity for low- and moderate-income ratepayers. I recommend the Commission consider energy affordability in this proceeding, and all future utility base rate proceedings, in evaluating rate increase requests consistent with the trends in other U.S. regulatory jurisdictions. Doing so would be consistent with the Commission's commitment "to making sure that Florida's consumers receive some of their most essential services…in a safe, *affordable*, and reliable manner."[2] (Emphasis added.)

III. LOAD FORECAST

A. DEF's Forecasting Process

Q. PLEASE EXPLAIN THE COMPANY'S FORECASTING PROCESS.

A. The Company's forecasting process involves econometric and end-use models to determine changes in usage per customer ("UPC"), energy sales, peak demand, and customer growth which ultimately forecasts test year revenues.[3] Each of these forecasts rely on several economic and demographic variables originating from both internal and

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[2] https://floridapsc.com/about#OverviewAndKeyFacts. Florida Public Service Commission Website. "Overview and Key Facts." 2024.
[3] Direct Testimony of Benjamin Borsch at 27:7-8.

external sources.[4] Sales are regressed against several independent variables to explain monthly fluctuations.[5]

Q. PLEASE EXPLAIN HOW THESE FORECASTING MODELS DIFFER BASED ON CUSTOMER CLASS.

A. The Company forecasts sales for six customer classes: residential; commercial; industrial; street lighting; public authorities; and sales for resale.[6] The UPC projections for the residential class and sales projections for the commercial class are based on Itron's statistically adjusted end use ("SAE") approach, whereas customer growth is based on county level population projections provided by Moody's Analytics.[7] The remaining four classes use class specific econometric models for energy sales and customer growth projections.[8]

Q. PLEASE EXPLAIN THE COMPANY'S SAE MODEL.

A. The parameters for the Company's SAE model rely primarily on three major types of variables:

- Those measuring weather expressed as cooling and heating degree days.[9]
- Those measuring economic outlook.[10]

[4] Direct Testimony of Benjamin Borsch at 27:17-28:1.
[5] Direct Testimony of Benjamin Borsch at 27:19-21.
[6] Direct Testimony of Benjamin Borsch at 28:11-33:12.
[7] Direct Testimony of Benjamin Borsch at 27:8-30:13.
[8] Direct Testimony of Benjamin Borsch at 30:15-33:12.
[9] Direct Testimony of Benjamin Borsch at 28:12-13.
[10] Direct Testimony of Benjamin Borsch at 28:14.

- Those measuring trends in appliance saturation and efficiency. For the residential class, the Company incorporated 19 appliances into their study.[11] For the commercial class, 10 categories of end-use equipment were identified.[12]

Q. DID THE COMPANY RELY UPON ANY "OUT-OF-MODEL" ADJUSTMENTS?

A. Yes. The Company relies on three major "out-of-model" adjustments to its sales forecast that include (1) revisions for changes in energy efficiency, (2) revisions for increases in electric vehicle adoption, and (3) revisions for increases in behind-the-meter solar installations.[13]

Q. WHAT DO YOU MEAN BY "OUT-OF-MODEL" ADJUSTMENTS?

A. An out-of-model adjustment is an additional, often subjective, modification to statistical model results. These modifications are considered "out-of-model" since they either modify, change, or disregard the results that are derived from a statistical model, which in this case, is the Company's SAE model. Practitioners often make these adjustments if they feel forecast results are either deficient or not properly informed by their explanatory (or independent) variables or statistical/mathematical specifications. An example of an out-of-model adjustment includes those used in the recent past to account for an unknown and not otherwise experienced change in economic conditions brought on by the COVID

[11] Direct Testimony of Benjamin Borsch at 28:16-21.
[12] Direct Testimony of Benjamin Borsch at 29:11-30:2.
[13] Direct Testimony of Benjamin Borsch at 37:1-38:7.

pandemic. These adjustments, while often informed by empirical data, also included a large degree of subjectivity.

Q. PLEASE EXPLAIN THE COMPANY'S ENERGY EFFICIENCY ADJUSTMENTS.

A. The Company applied separate megawatt-hour adjustments amounting to 343,852 in 2025, 389,374 in 2026, and 426,097 in 2027 as a reduction to their regression model results.[14] The adjustments are meant to represent forecasted energy reductions expected to be realized through demand-side mechanism ("DSM") goals.[15] The adjustments were applied to the residential, commercial, and other sales to public authorities customer classes.[16]

Q. WHAT SUPPORT DID THE COMPANY PROVIDE FOR THESE ENERGY EFFICIENCY ADJUSTMENTS?

A. The Company stated that the forecast is based on the most recent Commission approved DSM goals in Docket No. 20190018-EG.[17] No testimony, exhibits, workpapers, or any other type of supporting evidence was provided in support of the out-of-model adjustment in the Company's direct filing. Upon request for more details on how these energy efficiency adjustments were estimated, the Company provided the forecasted adjustment

[14] Company Response to Staff's First Set of Production of Documents, No. 1, Attachment "LF-23_Impacts_MWH", tab "UEE".
[15] Minimum Filing Requirement Schedule F-8, page 2 of 35.
[16] Company Response to Staff's First Set of Production of Documents, No. 1, Attachment "LF-23_Impacts_MWH", tab "UEE".
[17] Minimum Filing Requirement Schedule F-8, page 2 of 35.

results by customer class and month, but no supporting details on how those results were calculated.[18]

Q. DO YOU AGREE WITH THE INCLUSION OF THE COMPANY'S ENERGY EFFICIENCY ADJUSTMENTS INTO THE ENERGY SALES FORECAST?

A. No. The Company has failed to provide the supporting evidence necessary to prove whether their out-of-model adjustment for energy efficiency is reasonable. Furthermore, this adjustment leads to a number of other unexplained forecasting and documentation deficiencies. First, the Company references the Commission order related to 2019 Conservation Goals as the basis for their adjustment.[19] However, this Order only approves conservation goals from 2020 through 2024, with no mention of the test years 2025 through 2027 where the adjustments are being applied. Second, it is unclear how the Company is calculating their adjustment using the conservation goals from the referenced order. The order approves annual megawatt-hour conservation goals totaling 15,200 in 2020; 10,100 in 2021; 6,200 in 2022; 3,600 in 2023; and 2,000 in 2024.[20] In contrast, the Company's out-of-model energy efficiency adjustments are as high as 426,097 megawatt-hours in 2027. The Company's energy efficiency adjustment is, therefore, deficient in its support and documentation. The Company has simply not met its burden of proof in providing a transparent and easily replicable sales adjustment for future test year energy efficiency.

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[18] Company Response to Staff's First Set of Production of Documents, No. 1, Attachment "LF-23_Impacts_MWH", tab "UEE".
[19] Minimum Filing Requirement Schedule F-8, page 2 of 35.
[20] Order No. PSC-2019-0509-FOF-EG.

Q. PLEASE EXPLAIN THE COMPANY'S ELECTRIC VEHICLE ADJUSTMENTS.

A. The Company applied separate megawatt-hour adjustments amounting to 199,257 in 2025; 330,712 in 2026; and 512,160 in 2027 as an addition to their regression model results.[21] The adjustments are meant to represent the impact electric vehicle growth will have on Company load. The forecast relies upon assumptions including customer penetration levels as well as gasoline price expectations.[22] The adjustments were applied to the residential, commercial, and industrial customer classes.[23]

Q. WHAT SUPPORT DID THE COMPANY PROVIDE FOR THESE ELECTRIC VEHICLE ADJUSTMENTS?

A. The Company did not provide the supporting details on this out-of-model adjustment, nor the underlying assumptions made to calculate their results. The Company simply referenced the adjustment in testimony[24] and provided a brief description in their supporting filing schedules.[25] Upon request for more details on this electric vehicle out-of-model adjustment, the Company provided the forecasted adjustment results by customer class and month, but no supporting details on how those results were calculated.[26] The adjustment is not transparent and cannot be independently verified and, as a result, should be rejected by the Commission.

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[21] Company Response to Staff's First Set of Production of Documents, No. 1, Attachment "LF-23_Impacts_MWH", tab "EV".
[22] Minimum Filing Requirement Schedule F-8, page 3 of 35.
[23] Company Response to Staff's First Set of Production of Documents, No. 1, Attachment "LF-23_Impacts_MWH", tab "EV".
[24] Direct Testimony of Benjamin Borsch at 37:5-7.
[25] Minimum Filing Requirement Schedule F-8, page 3 of 35.
[26] Company Response to Staff's First Set of Production of Documents No. 1, Attachment "LF-23_Impacts_MWH", tab "EV".

C23-1769

Q. PLEASE EXPLAIN THE COMPANY'S SOLAR ENERGY ADJUSTMENTS.

A. The Company applied separate megawatt-hour adjustments amounting to 872,243 in 2025; 1,242,154 in 2026; and 1,627,823 in 2027 as a reduction to their regression model results.[27] The adjustments are meant to represent the impact that customer-owned behind-the-meter solar generation will have on future load. The model relies upon assumptions regarding future penetration levels, equipment prices, and electric prices.[28] The adjustments were applied to the residential, commercial, and industrial customer classes.[29]

Q. WHAT SUPPORT DID THE COMPANY PROVIDE FOR THESE SOLAR ENERGY ADJUSTMENTS?

A. The Company did not provide the supporting details nor the underlying assumptions used to estimate this out-of-model adjustment for solar energy generation. The lack of supporting evidence is troubling given the sheer size of these adjustments and the impact these solar energy adjustments will have on test year revenues. The only support the Company provides for this solar adjustment is a simple reference to their direct testimony[30] and a brief description of the adjustment in their related filing schedules.[31] Upon request for more details on this adjustment, its documentation and underlying assumptions, the Company provided the forecasted adjustment results by customer class and month, but no

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[27] Company Response to Staff's First Set of Production of Documents, No. 1, Attachment "LF-23_Impacts_MWH", tab "PV".
[28] Minimum Filing Requirement Schedule F-8, page 3 of 35.
[29] Company Response to Staff's First Set of Production of Documents, No. 1, Attachment "LF-23_Impacts_MWH", tab "PV".
[30] Direct Testimony of Benjamin Borsch at 37:5-7.
[31] Minimum Filing Requirement Schedule F-8, page 3 of 35.

supporting details on how those adjustments were calculated.[32] The Company has simply failed to meet its burden of proof on this adjustment. It is neither transparent nor independently verifiable and should be rejected by the Commission.

Q HOW LARGE ARE THE COMPANY'S COLLECTIVE OUT-OF-MODEL ADJUSTMENTS?

A Collectively, the Company's three out-of-model adjustments reduce their test year megawatt-hour energy sales by 1,016,839 in 2025; 1,300,816 in 2026; and 1,541,760 in 2027. The individual and collective impacts of these adjustments are shown on Exhibit DED-2. These adjustments, coupled with other Company projections showing sales decreases, are inconsistent with past trends and conventional wisdom. The Company's forecast and out-of-model adjustments all, surprisingly, suggest that its sales will decrease despite Florida being one of the fastest growth states in the country. Not only is Florida experiencing strong economic growth, but Orlando and Tampa are each among the top ten metro regions in the country at attracting new residents.[33] In fact, three of the top four fastest growing metro areas in the United States reside in DEF's service territory.[34] The Company has maintained consistent growth over the past decade and shows few signs of reversing course as the Company's forecast suggests. I will discuss the Company's

[32] Company Response to Staff's First Set of Production of Documents, No. 1, Attachment "LF-23_Impacts_MWH", tab "PV".
[33] Kristie Wilder and Paul Mackun, "Sunshine State Home to Metro Areas Among Top 10 U.S. Population Gainers From 2022 to 2023," Census Bureau, 2024.
[34] Kristie Wilder and Paul Mackun, "Sunshine State Home to Metro Areas Among Top 10 U.S. Population Gainers From 2022 to 2023," Census Bureau, 2024.

forecast and how it compares to these historic trends in the following section of my testimony.

B. Company Forecast Inconsistencies with Historic Trends

Q. WHAT ARE THE RESULTS OF THE COMPANY'S SALES AND CUSTOMER FORECASTS?

A. The Company forecasts a two percent sales decrease from 2023 to its 2027 test year while customers are forecasted to increase by seven percent. The divergence between these two forecasts is contradictory. Consider that the Company's forecasts suggest that end-use reductions in UPC will be far larger than all the new incremental load added to the Company's system due to new customer growth. Exhibit DED-3 shows the Company's historic sales, customer, and UPC trends compared to its proposed forecast. The analysis decomposes changes in usage attributable to existing customers (efficiency changes) and new customers (growth changes). The forecast for 2024 shows the large decreases in UPC from existing customers are forecasted to be over two and a half times larger in absolute value than usage changes attributable to new customer growth. Such an outcome has not happened since 2012 in the aftermath of the last recession of 2008 to 2009.

Q. ARE THE COMPANY'S SALES PROJECTIONS CONSISTENT WITH HISTORICAL TRENDS?

A. No. The Company is projecting a sales decrease throughout its individual future test years despite the fact that sales have steadily increased at an annualized rate of 1.1 percent from 2013 to 2023. In fact, over this historical period, sales grew for nine out of ten years and never experienced a decline over two consecutive years which is what the Company forecasts will happen for establishing test year revenues. Moreover, the projected decrease from 2023 to 2024 would be larger than anything experienced during the most recent ten-year historical period. The Company's decrease in forecast sales (1,053 GWh) is three times larger than the average annual decrease experienced from 2008 to 2011 during and immediately after the 2008 to 2009 recession. Exhibit DED-4 provides a chart comparing the Company's current forecast to a historic trend-based projection of ten-year sales. The difference between the two series is substantial and shows just how inconsistent the Company's sales forecast is with historic trends on a forward-going basis.

Q. ARE THE COMPANY'S UPC PROJECTIONS CONSISTENT WITH HISTORICAL TRENDS?

A. No. UPC declined by 0.5 percent on an annual average basis between 2013 and 2023 in direct contradiction to the Company's forecast which estimates a very large and steep 4.2 percent decline in 2024. In other words, much of the Company's test year projection hinges on their prediction that UPC will decrease at over eight times the ten-year historic rate.

Q. IS THIS A LARGE DECREASE IN FORECAST UPC?

A. Yes. I have examined the changes in total company UPC for all southeastern investor-owned utilities going back to before the last recession from 2009 to 2022. This includes 166 utilities over 14 years for a total of 2,324 observations. The results are shown on Exhibit DED-5. In the most recent year, only 5 utilities (three percent) have seen an annual UPC decrease that equals or exceeds the UPC forecasted by the Company in this

C23-1773

proceeding. Of those utilities, none were located in Florida or what could be considered a "growth" state comparable to Florida. The UPC projection made by the Company is more comparable to 2009 during the recession when 48 percent of utilities experienced an annual UPC decrease of an equal or greater magnitude. However, even during the 2009 recession, the average UPC decrease was 3.5 percent, lower than the Company's current projection.

C. Differences between Current and Prior Company Load Forecasts

Q. ARE THE COMPANY'S CURRENT FORECASTS CONSISTENT WITH THOSE FILED IN OTHER RECENT COMMISSION PROCEEDINGS?

A. No. The Company's load forecasts in this proceeding differ from the ones it filed in its most recently approved Ten-Year Site Plan ("TYSP")[35].

Q. WERE THE TYSP LOAD FORECASTS FILED OVER A RELATIVELY CONTEMPORANEOUS TIME PERIOD?

A. Yes. The Company filed load forecasts as part of the TYSP with the Commission in April 2024, the same month the Company filed direct testimony and exhibits for this rate case. Both rate case and TYSP results report historical loads from 2013 to 2023 as well as load projections from 2024 to 2027. Yet, despite matching results for the historical loads in both filings, the Company's load projections differ quite significantly.

[35] Duke Energy Florida, LLC, Ten-Year Site Plan, 2024.

Q. HOW DID THE COMPANY'S RATE CASE FORECAST DIFFER FROM THE 2024 TYSP?

A. A comparison of the Company's rate case and TYSP forecasts shown in Exhibit DED-6 reveals total forecasted energy sales in 2027 to be two percent lower than the corresponding equivalent forecast in the 2024 TYSP. These inconsistent forecasting results not only have significant revenue implications but have also led the Company to draw contradictory conclusions. For instance, when examining the residential class which is driving the Company's negative sales projections, the rate case model concludes that energy sales will <u>decrease</u> from 2023 to 2025, while the TYSP model concludes that energy sales will <u>increase</u> from 2023 to 2025.

Q. WHAT REASONING DID THE COMPANY PROVIDE TO EXPLAIN THE DIFFERENCES IN FORECAST FILINGS?

A. The Company states that it produces two load forecasts each year, one in the spring and one in the fall.[36] The forecast developed in the spring of 2023 ("spring forecast") was used to develop the current rate case while a more up-to-date forecast developed in the fall of 2023 ("fall forecast") was applied to the TYSP. The Company has acknowledged that the fall forecast utilizes more recent data.

[36] Company Response to Staff's First Set of Interrogatories, No. 2.

Q. DID THE COMPANY FILE AMENDED TESTIMONY AND MINIMUM FILING REQUIREMENTS TO INCORPORATE THE MORE RECENT FALL FORECAST RESULTS?

A. No, even upon request for revised minimum filing requirement schedules.[37] However, select workpapers related to load forecasting and revenues for the fall forecast were shared as attachments by the Company in discovery.

Q. WERE THE DIFFERENCES BETWEEN THE SPRING AND FALL FORECAST RESULTS SIGNIFICANT?

A. Yes. For 2027, the projected sales were 789,322 megawatt-hours higher in the fall forecast compared to the spring forecast. Furthermore, the out-of-model adjustments the Company uses to modify the statistical results of their model changed remarkably. The out-of-model adjustment for rooftop solar was 38 percent different between the spring and fall Forecast while the energy efficiency adjustment was 89 percent different. These eye-popping changes to the Company's forecast results are both undocumented and unexplained. Such striking and unexplained volatility in forecasting results after a short six-month period seriously calls into question the reliability of the Company's out-of-model adjustments.

[37] Company Response to OPC's Fourteenth Set of Interrogatories, No. 342.

C23-1776

D. Recommendations Regarding the Company's Load Forecasts

Q. PLEASE SUMMARIZE YOUR LOAD FORECAST RECOMMENDATION.

A. I recommend the Commission reject the Company's energy sales forecast because it bears no resemblance to historic trends and is biased due to the introduction of a number of subjective and non-documented out-of-model adjustments. Additionally, by the Company's own admission, the input data in the rate case model originates from the outdated spring forecast instead of the Company's more recent fall forecast.[38] I recommend the Commission accept a modified version of the Company's more recent fall forecast that removes subjective and non-documented out-of-model adjustments. The use of the fall forecast instead of the spring forecast will increase the Company's test year megawatt-hour sales forecast by 698,255 in 2025; 632,169 in 2026; and 789,322 in 2027. The removal of out-of-model adjustments from the fall forecast will increase the Company's test year megawatt-hour sales forecast by an additional 579,466 in 2025; 873,257 in 2026; and 1,107,452 in 2027. The result is a new, reasonable and conservative megawatt-hour sales projection of 41,076,721 in 2025; 41,432,426 in 2026; and 41,853,774 in 2027. Overall, the change in forecast (spring to fall) accounts for 45 percent of my proposed load forecast change while the removal of the out-of-model adjustments accounts for the remaining difference between the Company's proposed forecast and my own.

[38] Company Response to Staff's First Set of Interrogatories, No. 2.

Q. PLEASE SUMMARIZE THE REVENUE IMPACTS RESULTING FROM YOUR LOAD FORECAST RECOMMENDATION.

A. My recommendation will result in an increase in total proposed (filed) test year retail revenues of $94 million in 2025; $110 million in 2026; and $136 million in 2027. On a revenue basis, my proposed changes to update the forecast account for 46 percent of the change in total test year revenues (2025 through 2027), while the remaining 54 percent accounts for the total change attributable to the removal of the out-of-model adjustments. I consider this to be a conservative recommendation considering a forecast aligned with the Company's ten-year historical trend would result in a $142 million increase in 2025; $166 million increase in 2026; and $196 million increase in 2027.

IV. MULTI-YEAR RATE ("MYR") INCREASE

Q. PLEASE DESCRIBE THE COMPANY'S MYR INCREASE.

A. The Company's proposal is based on three forecasted test year periods, 12-month periods ending December 31, 2025, 2026, and 2027. The forecasted costs and revenues result in a three-step rate adjustment with rate increases going into effect within the first billing period of each year. The Company's proposed rate increases amount to revenue requirement increases of $593 million in 2025, $98 million in 2026, and $129 million in 2027 for a total increase of $820 million.[39] This represents a cumulative three-year base revenue increase of $2.105 billion.

[39] Direct Testimony of Marcia Olivier at 5:16-19.

Q. IS IT NORMAL FOR A UTILITY TO BE ALLOWED TO INCREASE RATES OVER MULTIPLE YEARS BASED ON MULTIPLE FORECASTED TEST PERIODS?

A. No. The traditional regulatory process allows for a single rate adjustment based on known and measurable information over a single test year period. The "known and measurable" standard helps ensure rates are fair, just, and reasonable. The traditional regulatory process also avoids shifting utility performance risk onto the ratepayers.

Q. WHAT POTENTIAL BENEFITS WERE IDENTIFIED BY THE COMPANY IN SUPPORT OF A MYR INCREASE?

A. The Company identified two benefits: (1) greater rate certainty for customers and (2) avoiding the cost of annual litigated rate cases for all parties involved.[40]

Q. HAS THE COMPANY PROVIDED EVIDENCE OR ANALYSIS TO SUPPORT WHY THESE ASSERTED BENEFITS OUTWEIGH THE POTENTIAL COSTS?

A. No. The Company has not provided evidence or analysis to support their decision to request a MYR increase over a traditional regulatory process. In fact, the Company failed to address the known risks associated with MYR increases or other alternative forms of regulation ("AFOR") more broadly. The Company has simply pointed to recent

[40] Direct Testimony of Marcia Olivier at 8:8-11.

C23-1779

Commission approvals for MYR increases.[41] Upon request for a cost-benefit analysis, the Company responded, "DEF has not performed any cost/benefit analyses of DEF's three proposed test years."[42]

Q. HAVE YOU EXAMINED AFOR PERFORMANCE IN OTHER JURISDICTIONS?

A. Yes, and that analysis is provided in Exhibit DED-7. For purposes of this analysis, AFORs are limited to the major "paradigm shifting" forms of regulation that include formula rate plans ("FRPs"), performance-based ratemaking ("PBR"), and multi-year rate plan ("MYRP") mechanisms.

Q. WHAT CONCLUSIONS DO YOU REACH FROM THIS ANALYSIS?

A. My analysis finds that, to date, no major AFOR has led to meaningful or measurable ratepayer benefits, including no sustainable or distinctly measurable improvement in reliability or quality of service. Indeed, not one single state adopting an AFOR has shown outcomes that can be held out as an unequivocal "success" for ratepayers. Specifically, AFORs have generally led to:

- Deterioration in utility capital investment discipline with significant increases in rate base;

[41] In the Matter of the Application for limited proceeding to approve 2017 second revised and restated settlement agreement, including certain rate adjustments, by Duke Energy Florida, LLC., Order No. PSC-2017-0451-AS-EU, issued November 20, 2017; In the Matter of the Petition for limited proceeding to approve 2021 settlement agreement, including general base rate increases, by Duke Energy Florida, LLC., Order No. PSC-2021-0202-AS-EI, issued June 4, 2021.

[42] Company Response to OPC's First Set of Production of Documents, No. 21.

- Large rate increases with very few rate decreases or earning sharing opportunities;
- No measurable or sustainable improvement in utility operating cost efficiencies; and
- No sustainable or distinctly measurable improvement in reliability or quality of service.

Q. HAVE THE COMPANY'S RETAIL RATES IMPROVED AS A RESULT OF ITS PAST MULTI-YEAR INCREASES?

A. No. The Company notes that both of DEFs last two settlements, the 2017 Settlement (term 2018-2021) and the 2021 Settlement (term 2022-2024), have included multiple-year rate increases.[43] These increases, however, have resulted in continued deterioration in the Company's retail rates relative to other Southeastern peer utilities. Exhibit DED-7 includes a section examining a number of different metrics including revenues, costs, and capital investments before and after the Company's MYR increases were approved. These metrics have been compiled for both the Company and other regional peer investor-owned utilities ("IOUs"). Pages 64 to 73 provide a comparison of the Company's retail rates (average non-fuel revenues) relative to peer utilities. The table and charts on these pages show the Company's retail rates have not improved since MYR increases first went into effect in 2018. On the contrary, from 2018 to 2023, non-fuel revenues relative to total sales ($/KWh) have increased from $0.062 to $0.109, or by 75 percent. The sharp increase in rates has caused the Company to have the 9th highest rates in the region (out of a peer group of 10 utilities), only behind Tampa Electric Company and just ahead of Florida Power &

[43] Direct Testimony of Marcia Olivier at 8:5-7.

C23-1781

Light Company, the two utilities the Company explicitly mentioned in direct testimony for having also been approved for multiple year rate increases.[44] From 2013 to 2017, prior to the two MYR increases, the Company ranked ahead of the peer group average in rate competitiveness with lower rates for three of the five years. In 2023, five years after the first MYR increase was adopted, the Company's rates were 46 percent higher than the peer group average.

Q. DID THE COMPANY SEE ANY IMPROVEMENTS IN ITS OPERATING COST EFFICIENCIES SINCE MYR INCREASES WERE APPROVED?

A. No. Pages 74 to 80 of Exhibit DED-7 show a variety of comparisons of both the Company's O&M and A&G costs. Over the past 10 years, the Company has not seen demonstrative improvement in its O&M costs relative to peer utilities. O&M expenses relative to total sales ($/MWh) have been consistently higher than the peer group average and most recently ranked in the bottom half for O&M efficiency. To make matters worse, the Company's A&G costs have become remarkably less efficient in recent years. From 2013 to 2017, prior to the two MYR increases, the Company's A&G expenses relative to total sales ($/MWh) were more efficient than the peer average for 4 out of the 5 years with a consistent downward trend. From 2018 to 2023, after the two MYR increase approvals, A&G costs have skyrocketed above the peer group average and remained higher every year since. By 2023, the Company's A&G costs of $14.13/MWh ranked the worst in the peer group and over double the peer group average of $6.94/MWh.

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[44] Direct Testimony of Marcia Olivier at 8:18-20.

Q. DID THE COMPANY SEE ANY IMPROVEMENTS IN ITS CAPITAL COST EFFICIENCIES SINCE MYR INCREASES WERE APPROVED?

A. No. As shown in pages 81 to 85 of Exhibit DED-7, net plant in service per customer has grown every year since 2013. Since 2018, net plant per customer has grown at an average rate of 11.7%, outpacing the peer average of 7.2%. This has caused the Company to drop in its peer ranking from 2 out of 10 in 2017 to 7 out of 10 in 2023.

Q. WHAT ARE YOUR RECOMMENDATIONS REGARDING THE COMPANY'S PROPOSED MYR INCREASE?

A. I recommend the Commission reject the Company's requests for subsequent rate increases in 2026 and 2027, and instead only allow for a single rate adjustment in 2025 – if otherwise justified. The Company's testimony and exhibits contain no analysis or support that multi-year rate increases have provided any ratepayer benefits or will result in any *bona fide* and measurable public benefits. My review of multi-year rate cases and other forms of alternative regulation around the U.S. has found that these forms of regulation lead to higher rates, little to no efficiency benefits, and less capital spending discipline.

V. <u>ENERGY AFFORDABILITY</u>

Q. HOW DO YOU DEFINE ENERGY AFFORDABILITY?

A. While there is no universally accepted definition of energy affordability, it is typically examined within the context of how expensive energy is relative to household income.[45]

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[45] *See*, "Understanding Energy Affordability" ACEEE, 2015, page 1.

C23-1783

Affordability, more generally, can be utilized as an index number to measure, among other things, the ability of a specific type of household to pay for essential utility services such as water, electric, and/or natural gas.

Q. ARE THERE ANY THRESHOLDS AT WHICH ENERGY SIMPLY BECOMES "UNAFFORDABLE" OR "BURDENSOME?"

A. Yes. The most accepted and utilized threshold at which utilities, and thus energy, becomes unaffordable or burdensome is when the percentage of income spent on energy exceeds six percent.[46] This threshold comes from the Fisher, Sheehan, and Colton's Home Energy Affordability Gap Study from 2011. The threshold is based on the premise that total shelter costs (including rent/mortgage and all utilities) should not exceed 30 percent of income and that 20 percent of shelter costs should be allocated to energy bills. Thus, 20 percent of 30 percent yields a six percent affordable utility burden.[47] Utility burdens below six percent are classified as "affordable," and energy burdens above six percent are classified as "unaffordable."

Q. HOW DOES ACADEMIC LITERATURE EXAMINE UTILITY AFFORDABILITY?

A. The academic literature examines energy affordability through various metrics but predominantly through utility and energy burden rates. Utility burden rates measure the impact of a utility bill on household income. The American Council for an Energy Efficient

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[46] *See*, "Understanding Energy Affordability" ACEEE, 2015, page 2.
[47] Fisher, Sheehan, and Colton. "Home Energy Affordability in New York: The Affordability Gap 2008-2010", June 2011, page 2.

Economy (ACEEE)'s *Understanding Energy Affordability* Report best encapsulates what academicians have studied. ACEEE's report determines four drivers of high energy burdens: (1) physical (i.e. housing age and type, poor insulation, weather extremes); (2) economic (i.e. chronic or sudden economic hardship); (3) behavioral (lack of access to information for bill payment assistance); and (4) policy (insufficient programs for bill assistance, high fixed customer charges).[48] It also examines utility burden rates throughout the United States, classifying any total utility burden above six percent as a household that experiences a high energy burden.[49]

Q. HOW IS THE CONCEPT OF ENERGY AFFORDABILITY RECOGNIZED IN REGULATION AND PUBLIC POLICY?

A. Energy affordability is increasingly becoming an important regulatory policy consideration with various states and local governments now setting energy affordability targets. Recently, New York set a state-wide goal of achieving a six percent energy burden.[50] The City of Portland, Oregon, released a Ten-Year Plan to Reduce Energy Burden in Oregon Affordable Housing.[51] The California Public Utilities Commission ("CPUC") developed the state's first energy affordability metric that tracks affordability for essential services (electric, gas, water, and communications).[52] The Pennsylvania Public Utility Commission

[48] "Understanding Energy Affordability" ACEEE, 2015, page 2.
[49] *Id.*, at page 3.
[50] "Understanding and Alleviating Energy Cost Burden in New York City," (August 2019) NYC Mayor's Office of Sustainability and the Mayor's Office for Economic Opportunity, at p. 2.
[51] "Reducing the Energy Burden in Oregon Affordable Housing – Ten-year Plan," (2018), Built Environment Energy Working Group.
[52] California Public Utilities Commission Order 18-07-006, 2018.

C23-1785

("PPUC") examined home energy burdens for low-income Pennsylvanians in its Home Energy Affordability 2019 report[53] and subsequently issued a policy statement on March 21, 2020, establishing maximum energy burdens for customers.[54] These examples demonstrate that examining energy affordability has become paramount in utility regulation across the country.

Q. DO LOW INCOME HOUSEHOLDS SPEND PROPORTIONATELY MORE IN ELECTRICITY THAN HIGHER INCOME HOUSEHOLDS?

A. Yes. Lower income households spend a larger share of their income on electricity than higher income households. In other words, while households consume more electricity as income increases, the share of their income they spend on electricity decreases as their income increases.

Q. HAVE YOU ESTIMATED ENERGY AFFORDABILITY USING THE COMPANY'S PROPOSED RESIDENTIAL RATES?

A. Yes. Exhibit DED-8 presents residential Energy Affordability Index estimates at both the 15th and 20th income percentiles. This analysis finds that both indexes are already greater than six percent, indicating a significant level of energy burden for both income brackets. Moreover, energy is expected to remain unaffordable for these income brackets as rates are increased in 2025, 2026, and 2027.

[53] Exhibit OPC (A)-24, Home Energy Affordability for Low-Income Customers in Pennsylvania, (January 2019) Pennsylvania Public Utility Commission.
[54] 52 PA. Code Ch. 69.

Q. WHAT DO THESE FINDINGS MEAN FOR THE COMPANY'S PROPOSAL?

A. Energy affordability remains a challenging issue around the U.S. as well as in the Company's service territory. DEF-specific electricity costs as a share of income remain unaffordable for the Company's low-income customers. Continued multi-year rate increases will do nothing to improve the affordability of electricity for low- and moderate-income ratepayers. I recommend the Commission consider energy affordability in this proceeding, and all future utility base rate proceedings, in evaluating rate increase requests consistent with the trends in other U.S. regulatory jurisdictions. Doing so would be consistent with the Commission's commitment "to making sure that Florida's consumers receive some of their most essential services…in a safe, *affordable*, and reliable manner."[55] (Emphasis added.)

VI. CONCLUSIONS AND RECOMMENDATIONS

Q. PLEASE SUMMARIZE YOUR LOAD FORECAST RECOMMENDATION.

A. I recommend the Commission reject the Company's energy sales forecast because it bears no resemblance to historic trends and is biased due to the introduction of a number of subjective and non-documented out-of-model adjustments. Additionally, by the Company's own admission, the input data in the rate case model originates from the outdated spring forecast instead of the Company's more recent fall forecast.[56] I recommend the Commission accept a modified version of the Company's more recent fall forecast that removes subjective and non-documented out-of-model adjustments. The use

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[55] https://floridapsc.com/about#OverviewAndKeyFacts. Florida Public Service Commission Website. "Overview and Key Facts." 2024.

[56] Company Response to Staff's First Set of Interrogatories, No. 2.

of the fall forecast instead of the spring forecast will increase the Company's test year megawatt-hour sales forecast by 698,255 in 2025; 632,169 in 2026; and 789,322 in 2027. The removal of out-of-model adjustments from the fall forecast will increase the Company's test year megawatt-hour sales forecast by an additional 579,466 in 2025; 873,257 in 2026; and 1,107,452 in 2027. The result is a new megawatt-hour sales projection of 41,076,721 in 2025; 41,432,426 in 2026; and 41,853,774 in 2027. Overall, the change in forecast (spring to fall) accounts for 45 percent of my proposed load forecast change while the removal of the out-of-model adjustments accounts for the remaining difference between the Company's proposed forecast and my own.

Q. PLEASE SUMMARIZE THE REVENUE IMPACTS RESULTING FROM YOUR LOAD FORECAST RECOMMENDATION.

A. My recommendation will result in an increase in total proposed (filed) test year retail revenues of $94 million in 2025; $110 million in 2026; and $136 million in 2027. On a revenue basis, my proposed changes to update the forecast account for 46 percent of the change in total test year revenues (2025 through 2027), while the remaining 54 percent accounts for the total change attributable to the removal of the out-of-model adjustments. I consider this to be a conservative recommendation considering a forecast aligned with the Company's ten-year historical trend would result in a $142 million increase in 2025; $166 million increase in 2026; and $196 million increase in 2027.

Q. PLEASE SUMMARIZE YOUR MULTI-YEAR RATE PLAN RECOMMENDATION.

A. I recommend the Commission reject the Company's requests for subsequent rate increases in 2026 and 2027, and instead only allow for a single rate adjustment in 2025 – if otherwise justified. The Company's testimony and exhibits contain no analysis or support that multi-year rate increases have provided any ratepayer benefits or will result in any *bona fide* and measurable public benefits. My review of multi-year rate cases and other forms of alternative regulation around the U.S. has found that these forms of regulation lead to higher rates, little to no efficiency benefits, and less capital spending discipline.

Q. PLEASE SUMMARIZE YOUR FINDINGS REGARDING ENERGY AFFORDABILITY IN THE COMPANY'S SERVICE TERRITORY.

A. Energy affordability remains a challenging issue around the U.S. as well as in the Company's service territory. DEF-specific electricity costs as a share of income remain unaffordable for the Company's low-income customers. Continued multi-year rate increases will do nothing to improve the affordability of electricity for low- and moderate-income ratepayers. I recommend the Commission consider energy affordability in this proceeding, and all future utility base rate proceedings, in evaluating rate increase requests consistent with the trends in other U.S. regulatory jurisdictions. Doing so would be consistent with the Commission's commitment "to making sure that Florida's consumers receive some of their most essential services…in a safe, *affordable*, and reliable manner."[57] (Emphasis added.)

Q. DOES THIS COMPLETE YOUR PREFILED DIRECT TESTIMONY?

A. Yes, at this time. However, the compressed procedural schedule in this proceeding for filing Intervenor testimony has limited the time to complete OPC's investigation into the issues and effects of those issues on the Company's petition. Consequently, it is my understanding that OPC reserves the right to file supplemental testimony to fully address these issues and effects of those issues, if necessary.

[57] https://floridapsc.com/about#OverviewAndKeyFacts. Florida Public Service Commission Website. "Overview and Key Facts." 2024.

C23-1790

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EDUCATION

Ph.D., Economics, Florida State University, 1995.
M.S., Economics, Florida State University, 1992.
M.S., International Affairs, Florida State University, 1988.
B.A., History, University of West Florida, 1987.
A.A., Liberal Arts, Pensacola State College, 1985.

Master's Thesis: *Nuclear Power Project Disallowances: A Discrete Choice Model of Regulatory Decisions*

Ph.D. Dissertation: *An Empirical Examination of Environmental Externalities and the Least-Cost Selection of Electric Generation Facilities*

ACADEMIC APPOINTMENTS

Louisiana State University, Baton Rouge, Louisiana

Center for Energy Studies

2023-Current	Professor Emeritus
2014-2023	Executive Director (Retired in 2023)
2007-2023	Director, Division of Policy Analysis
2006-2023	Professor
2003-2014	Associate Executive Director
2001-2006	Associate Professor
1999-2001	Research Fellow and Adjunct Assistant Professor
1995-2000	Assistant Professor

College of the Coast and the Environment (Department of Environmental Studies)

2014-2023	Professor (Joint Appointment with CES)
2010-2023	Director, Coastal Marine Institute
2010-2014	Adjunct Professor

E.J. Ourso College of Business Administration (Department of Economics)

2006-2023	Adjunct Professor
2001-2006	Adjunct Associate Professor
1999-2000	Adjunct Assistant Professor

Michigan State University, East Lansing, Michigan

Institute of Public Utilities

2018-Current	Senior Fellow

Florida State University, Tallahassee, Florida

College of Social Sciences, Department of Economics

1995	Instructor

PROFESSIONAL EXPERIENCE

Acadian Consulting Group, Baton Rouge, Louisiana

2001-Current	Consulting Economist/Principal
1995-1999	Consulting Economist/Principal

Econ One Research, Inc., Houston, Texas

1999-2001	Senior Economist

Florida Public Service Commission, Tallahassee, Florida

Division of Communications, Policy Analysis Section

1995	Planning & Research Economist

Division of Auditing & Financial Analysis, Forecasting Section

1993	Planning & Research Economist
1992-1993	Economist

Project for an Energy Efficient Florida/FlaSEIA, Tallahassee, Florida

1994	Energy Economist

Ben Johnson Associates, Inc., Tallahassee, Florida

1991-1992	Research Associate
1989-1991	Senior Research Analyst
1988-1989	Research Analyst

GOVERNMENT & ADVISORY APPOINTMENTS

2023 – Current	Distinguished Fellow & Senior Economist Institute For Energy Research Washington, D.C.
2017 -- Current	Member, National Petroleum Council. U.S. Department of Energy.
2020-2023	Co-Chairperson, Energy Advisory Committee, World Trade Center New Orleans, Louisiana.
2007-2023	Louisiana Representative, Interstate Oil and Gas Compact Commission; Energy Resources, Research & Technology

	Committee.
2007-2023	Louisiana Representative, University Advisory Board Representative; Energy Council (Center for Energy, Environmental and Legislative Research).
2005	Member, Task Force on Energy Sector Workforce and Economic Development (HCR 322).
2003-2005	Member, Energy and Basic Industries Task Force, Louisiana Economic Development Council
2001-2003	Member, Louisiana Comprehensive Energy Policy Commission.

PUBLICATIONS: BOOKS AND MONOGRAPHS

1. *Energy and Environment: The Grand Challenges of 21st Century.* (2022). With Chris F. D'Elia and Bryan F. Snyder. New York: Kendell Hunt Publishers. Pp. 153.
2. *Power System Operations and Planning in a Competitive Market*. (2002). With Fred I. Denny. New York: CRC Press. Pp. 133.
3. *Distributed Energy Resources: A Practical Guide for Service.* (2000). With Ritchie Priddy. London: Financial Times Energy. Pp. 60.

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24. *Estimating the Impact of Net Metering on LPSC Jurisdictional Ratepayers. (2015). Louisiana Public Service Commission, In re: Examination of the Comprehensive Costs and Benefits of Net Metering in Louisiana, Docket No. X-33192. Notice of Issuance of Final Report dated September 11, 2015,* 187 pp.

25. *Beyond the Energy Roadmap: Starting Mississippi's Energy-Based Economic Development Venture.* (2014). Report prepared on behalf of the Mississippi Energy Institute, 310 pp.

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Department of Natural Resources, Baton Rouge, Louisiana. 17 pp.

27. *Combined Heat and Power in Louisiana: Status, Potentials, and Policies. Phase 3 Report: Empirical Results, Technical and Cost-Effectiveness Potentials*. (2013). Louisiana Department of Natural Resources, Baton Rouge, Louisiana. 65 pp.

28. *Combined Heat and Power in Louisiana: Status, Potentials, and Policies. Phase 2 Report: Technical and Cost Effectiveness Methodologies*. (2013). Louisiana Department of Natural Resources, Baton Rouge, Louisiana. 39 pp.

29. *Combined Heat and Power in Louisiana: Status, Potentials, and Policies. Phase 1 Report: Resource Characterization and Database*. (2013). Louisiana Department of Natural Resources, Baton Rouge, Louisiana. 62 pp.

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33. *The Impact of Legacy Lawsuits on Conventional Oil and Gas Drilling in Louisiana*. (2012). Baton Rouge, LA: LSU Center for Energy Studies, 62 pp.

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35. *OCS-Related Infrastructure Fact Book. Volume I: Post-Hurricane Impact Assessment*. (2011). U.S. Department of the Interior, Bureau of Ocean Energy Management, Gulf of Mexico Region, New Orleans, LA. OCS Study BOEM 2011-043. 372 pp.

36. *Fact Book: Offshore Oil and Gas Industry Support Sectors*. (2010). U.S. Department of the Interior, Bureau of Ocean Energy Management, Gulf of Mexico Region, New Orleans, LA. OCS Study BOEM 2010-042. 138pp.

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Development. Baton Rouge, LA: LSU Center for Energy Studies, 114 pp.

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41. *Economic and Energy Market Benefits of the Proposed Cavern Expansions at the Jefferson Island Storage and Hub Facility*. (2009). Report prepared on behalf of Jefferson Island Storage and Hub, LLC, 28 pp.

42. *The Benefits of Continued and Expanded Investments in the Port of Venice*. (2009). With Christopher Peters and Kathryn Perry. Baton Rouge, LA: LSU Center for Energy Studies. 83 pp.

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46. *The Economic Impacts of New Jersey's Proposed Renewable Portfolio Standard.* (2005) Report Prepared on Behalf of the New Jersey Division of Ratepayer Advocate.

47. *The Importance of Energy Production and Infrastructure in Plaquemines Parish*. (2006). Report Prepared on Behalf of Project Rebuild Plaquemines.

48. *Louisiana's Oil and Gas Industry: A Study of the Recent Deterioration in-State Drilling Activity*. (2005). With Kristi A.R. Darby, Jeffrey M. Burke, and Robert H. Baumann. Baton Rouge, LA: Louisiana Department of Natural Resources.

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C23-1805

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56. *An Analysis of the Economic Impacts Associated with Oil and Gas Activities on State Leases*. (2002) With Robert H. Baumann, Dmitry V. Mesyanzhinov, and Allan G. Pulsipher. Baton Rouge, LA: Louisiana Department of Natural Resources, Office of Mineral Resources.

57. *Alaska In-State Natural Gas Demand Study*. (2002). With Dmitry Mesyanzhinov, et.al. Anchorage, Alaska: Alaska Department of Natural Resources, Division of Oil and Gas.

58. *Moving to the Front of the Lines: The Economic Impacts of Independent Power Plant Development in Louisiana*. (2001). With Dmitry Mesyanzhinov and Williams O. Olatubi. Baton Rouge, LA: Louisiana State University, Center for Energy Studies.

59. *The Economic Impacts of Merchant Power Plant Development in Mississippi.* (2001). Report Prepared on Behalf of the US Oil and Gas Association, Alabama and Mississippi Division. Houston, TX: Econ One Research, Inc.

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61. *Assessing the Environmental and Safety Risks of the Expanded Role of Independents in Oil and Gas E&P Operations on the U.S. Gulf of Mexico OCS.* (1996). With Allan Pulsipher, Omowumi Iledare, Dmitry Mesyanzhinov, William Daniel, and Bob Baumann. Baton Rouge, LA: Louisiana State University, Center for Energy Studies.

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GRANT RESEARCH

1. *Co-Principal Investigator* (2022). With Gregory B. Upton, Jr. Estimating the benefits of electricity restoration to critical energy infrastructure. Funded by Entergy Corporation. Total Funding: $56,088. Status: Completed.

2. *Co-Principal Investigator*. (2021). With Gregory B. Upton Jr. Estimating the benefits of underground carbon dioxide storage investments. Funded by Gulf Coast Sequestration. Total Funding: $124,835. Status: In Progress.

3. *Principal Investigator*. (2021). Louisiana Greenhouse Gas Inventory Update and Report. Governor's Office of Coastal Affairs. Total Funding $65,830. Status: Completed.

4. *Principal Investigator*. (2021). Estimating Louisiana's power generation greenhouse gas

emissions. The Nature Conservancy. Total Funding: $9,994. Status: Completed.

5. *Co-Principal Investigator*. (2021). With Gregory B. Upton. Estimating the economic impacts of methanol investments in St. James Parish. Koch Industries. Total Funding: $37,457. Status: Completed.

6. *Co-Principal Investigator*. (2019). With Gregory B. Upton Estimating the economic impact of TransCanada pipeline investments. TransCanada Pipelines. Total Funding: $40,798. Status: Completed.

7. *Co-Principal Investigator*. (2018). With Gregory B. Upton. Estimating the economic impact of Enable Pipeline Investments. Total Funding: $49,798. Status: Completed.

8. *Co-investigator*. Estimating offshore Gulf of Mexico carbon capture, sequestration, and utilization opportunities. (2018). With Southern States Energy Board, Advanced Resources International, Argonne Laboratories, University of Alabama, University of South Carolina, and Oklahoma State University. U.S. Department of Energy, National Energy Technology Laboratory. Total funding: $731,031 (LSU share of $4.0 million project, three years, in progress).

9. *Co-Principal Investigator*. Planning Grant: Engineering Research Center for Resiliency Enhancement and Disaster-Impact Interception ("READII") in the Manufacturing Sector. (2018). With Mahmoud El-Halwagi, Mark Stadtherr, Heshmat Aglan, Efstratos Postikopoulus. National Science Foundation (#1840512). Total Funding: $100,000 (one year). Status: Completed.

10. *Principal Investigator*. Understanding MISO long term infrastructure needs and stakeholder positions. (2017). Midcontinent Independent System Operator. Total Project: $9,500, six months. Status: Completed.

11. *Principal Investigator*. Offshore oil and gas activity impacts on ecosystem services in the Gulf of Mexico. (2017). With Brian F, Snyder. U.S. Department of the Interior, Bureau of Ocean Energy Management. Total Project: $240,982, two years. Status: Completed.

12. *Principal Investigator*. Economic Impacts of the Bayou Bridge pipeline. (2017). With Gregory B, Upton, Jr., Energy Transfer Corporation. $9,900. Status: Completed.

13. *Principal Investigator*. Integrated carbon capture, storage and utilization in the Louisiana chemical corridor. (2017). U.S, Department of Energy/National Energy Technology Laboratory. Total funding: $1,300,000 (18 months). Status: Completed.

14. *Co-Principal Investigator*. Gulf coast energy outlook and analysis. (2016). With Gregory B. Upton and Mallory Vachon. Regions Bank. Total funding: $20,000, one year. Status: Completed.

15. *Principal Investigator*. GOM energy infrastructure trends and factbook update. (2016). With Gregory B. Upton and Mallory Vachon. U.S. Department of the Interior, Bureau of Ocean Energy Management ("BOEM"). Total funding: $224,995, two years. Status: In progress.

16. *Principal Investigator*. Examining Louisiana's Industrial Carbon Sequestration Potential. Phase 2: Follow-up and estimation. (2016). With Brian F. Snyder. Southern States Energy Board. Total Project: $69,990, three months. Status: Completed.

17. *Principal Investigator*. Examining Louisiana's Industrial Carbon Sequestration Potential.

Phase 1: Scoping and Identification. (2016). With Brian F. Snyder. Southern States Energy Board. Total Project: $29,919, three months. Status: Completed.

18. *Principal Investigator*. Energy efficiency building codes for Louisiana. (2016). With Brian F. Snyder. Louisiana Department of Natural Resources. Total Project: $50,000, one year. Status: Completed.

19. *Principal Investigator*. An update of Louisiana's combined heat and power potentials, current utilizations, and barriers to improved operating efficiencies. (2016). Louisiana Department of Natural Resources. Total Project: $90,000, one year. Status: Completed.

20. *Principal Investigator*. Combined Heat and Power Stakeholder Meeting. (2016). Southeastern Energy Efficiency Council. Total Project $9,160, two months. Status: Completed.

21. *Co-Investigator*. "Expanding Ecosystem Service Provisioning from Coastal Restoration to Minimize Environmental and Energy Constraints" (2015). With John Day and Chris D'Elia. Gulf Research Program. Total Project: $147,937. Status: Completed.

22. *Principal Investigator*. "Coastal Marine Institute Administrative Grant" (2104). U.S. Department of the Interior. Total Project $45,000. Status: Completed.

23. *Principal Investigator*. "Analysis of the Potential for Combined Heat and Power (CHP) in Louisiana." (2013). Louisiana Department of Natural Resources. Total Project: $90,000. Status: Completed.

24. *Co-Investigator*. "CNH: A Tale of Two Louisianas: Coupled Natural-Human Dynamics in a Vulnerable Coastal System" (2013) With Nina Lam, Margaret Reams, Kam-Biu Liu, Victor Rivera, Yi-Jun Xu and Kelley Pace. National Science Foundation. Total Project: $1.5 million. Status: Completed (Sept 2012-Feb 2017).

25. *Principal Investigator*. "Examination of Unconventional Natural Gas and Industrial Economic Development" (2012). America's Natural Gas Alliance. Total Project: $48,210. Status: Completed.

26. *Principal Investigator*. "Investigation of the Potential Economic Impacts Associated with Shell's Proposed Gas-To-Liquids Project" (2012). Shell Oil Company, North America. Total Project: $76,708. Status: Completed.

27. *Principal Investigator*. "Analysis of the Federal Wind Energy Production Tax Credit." American Energy Alliance. Total Project: $20,000. Status: Completed.

28. *Principal Investigator*. "Energy Sector Impacts Associated with the Deepwater Horizon Oil Spill." Louisiana Department of Economic Development. Total Project: approximately $50,000. Status: Completed.

29. *Principal Investigator*. "Economic Contributions and Benefits Support by the Port of Venice." Port of Venice Coalition. Total Project: $20,000. Status: Completed.

30. *Principal Investigator.* "Energy Policy Development in Louisiana." Louisiana Department of Natural Resources. Total Project: $150,000. Status: Completed.

31. *Principal Investigator.* "Preparing Louisiana for the Possible Federal Regulation of Greenhouse Gas Regulation." With Michael D. McDaniel. Louisiana Department of Economic Development. Total Project: $98,543. Status: Completed.

32. *Principal Investigator*. "OCS Studies Review: Louisiana and Texas Oil and Gas Activity and Production Forecast; Pipeline Position Paper; and Geographical Units for Observing and Modeling Socioeconomic Impact of Offshore Activity." (2008). With Mark J. Kaiser and Allan G. Pulsipher. U.S. Department of the Interior, Minerals Management Service. Total Project: $377,917 (3 years). Status: Completed.

33. *Principal Investigator*. "State and Local Level Fiscal Effects of the Offshore Petroleum Industry." (2007). With Loren C. Scott. U.S. Department of the Interior, Minerals Management Service. Total Project: $241,216 (2.5 years). Status: Completed.

34. *Principal Investigator*. "Understanding Current and Projected Gulf OCS Labor and Ports Needs." (2007). With Allan. G. Pulsipher, Kristi A. R. Darby. U.S. Department of the Interior, Minerals Management Service. Total Project: $169,906. (one year). Status: Completed.

35. *Principal Investigator*. "Structural Shifts and Concentration of Regional Economic Activity Supporting GOM Offshore Oil and Gas Activities." (2007). With Allan. G. Pulsipher, Michelle Barnett. U.S. Department of the Interior, Minerals Management Service. Total Project: $78,374 (one year). Status: Awarded, Completed.

36. *Principal Investigator*. "Plaquemine Parish's Role in Supporting Critical Energy Infrastructure and Production." (2006). With Seth Cureington. Plaquemines Parish Government, Office of the Parish President and Plaquemines Association of Business and Industry. Total Project: $18,267. Status: Completed.

37. *Principal Investigator*. "Diversifying Energy Industry Risk in the Gulf of Mexico." (2006). With Kristi A. R. Darby. U.S. Department of the Interior, Minerals Management Service. Total Project: $65,302 (two years). Status: Awarded, Completed.

38. *Principal Investigator*. "Post-Hurricane Assessment of OCS-Related Infrastructure and Communities in the Gulf of Mexico Region." (2006). U.S. Department of the Interior, Minerals Management Service. Total Project Funding: $244,837. Status: Completed.

39. *Principal Investigator*. "Ultra-Deepwater Road Mapping Process." (2005). With Kristi A. R. Darby, Subcontract with the Texas A&M University, Department of Petroleum Engineering. Funded by the Gas Technology Institute. Total Project Funding: $15,000. Status: Completed.

40. *Principal Investigator*. "An Examination of the Opportunities for Drilling Incentives on State Leases." (2004). With Robert H. Baumann and Kristi A. R. Darby. Louisiana Office of Mineral Resources. Total Project Funding: $75,000. Status: Completed.

41. *Principal Investigator*. " An Examination on the Development of Liquefied Natural Gas Facilities on the Gulf of Mexico." (2004). With Dmitry V. Mesyanzhinov and Mark J. Kaiser. U.S. Department of the Interior, Minerals Management Service. Total Project Funding $101,054. Status: Completed.

42. *Principal Investigator*. "Examination of the Economic Impacts Associated with Large Customer, Industrial Retail Choice." (2004). With Dmitry V. Mesyanzhinov. Louisiana Mid-Continent Oil and Gas Association. Total Project Funding: $37,000. Status: Completed.

43. *Principal Investigator*. "Economic Opportunities from LNG Development in Louisiana." (2003). With Dmitry V. Mesyanzhinov. Metrovision/New Orleans Chamber of Commerce

and the Louisiana Department of Economic Development. Total Project Funding: $25,000. Status: Completed.

44. *Principal Investigator*. "Marginal Oil and Gas Properties on State Leases in Louisiana: An Empirical Examination and Policy Mechanisms for Stimulating Additional Production." (2002). With Robert H. Baumann and Dmitry V. Mesyanzhinov. Louisiana Office of Mineral Resources. Total Project Funding: $72,000. Status: Completed.

45. *Principal Investigator*. "A Collaborative Investigation of Baseline and Scenario Information for Environmental Impact Statements." (2002). With Dmitry V. Mesyanzhinov and Williams O. Olatubi. U.S. Department of Interior, Minerals Management Service. Total Project Funding: $557,744. Status: Awarded, In Progress.

46. *Co-Principal Investigator*. "An Analysis of the Economic Impacts of Drilling and Production Activities on State Leases." (2002). With Robert H. Baumann, Allan G. Pulsipher, and Dmitry V. Mesyanzhinov. Louisiana Office of Mineral Resources. Total Project Funding: $8,000. Status: Completed.

47. *Principal Investigator*. "Cost Profiles and Cost Functions for Gulf of Mexico Oil and Gas Development Phases for Input Output Modeling." (1998). With Dmitry Mesyanzhinov and Allan G. Pulsipher. U.S. Department of Interior, Minerals Management Service. Total Project Funding: $244,956. Status: Completed.

48. *Principal Investigator*. "An Economic Impact Analysis of OCS Activities on Coastal Louisiana." (1998). With Dmitry Mesyanzhinov and David Hughes. U.S. Department of Interior, Minerals Management Service. Total Project Funding: $190,166. Status: Completed.

49. *Principal Investigator*. "Energy Conservation and Electric Restructuring in Louisiana." (1997). Louisiana Department of Natural Resources." Petroleum Violation Escrow Program Funds. Total Project Funding: $43,169. Status: Completed.

50. *Principal Investigator*. "The Industrial Supply of Electricity: Commercial Generation, Self-Generation, and Industry Restructuring." (1996). With Andrew Kleit. Louisiana Energy Enhancement Program, LSU Office of Research and Development. Total Project Funding: $19,948. Status: Completed.

51. *Co-Principal Investigator*. "Assessing the Environmental and Safety Risks of the Expanded Role of Independents in Oil and Gas E&P Operations on the U.S. Gulf of Mexico OCS." (1996). With Allan Pulsipher, Omowumi Iledare, Dmitry Mesyanzhinov, William Daniel, and Bob Baumann. U.S. Department of Interior, Minerals Management Service, Grant Number 95-0056. Total Project Funding: $109,361. Status: Completed.

ACADEMIC CONFERENCE PAPERS/PRESENTATIONS

1. "The changing nature of Gulf of Mexico energy infrastructure." (2017). Session 3B: New Directions in Social Science Research. 27th Gulf of Mexico Region Information Technology Meetings. U.S. Department of the Interior, Bureau of Ocean Energy Management, Environmental Studies Program. New Orleans, LA. August 24.

2. "Capacity utilization, efficiency trends, and economic risks for modern CHP installations." (2017). U.S. Department of Energy, 2017 Industrial Energy Technology Conference, New Orleans, LA June 21.

3. “Vulnerability assessment of the central Gulf of Mexico coast using a multi-dimensional approach.” (2016). With Siddhartha Narra. Eighth International Conference on Environmental Science and Technology. June 6-10, Houston, TX.

4. “The Impact of Infrastructure Cost Recovery Mechanisms on Pipeline Replacements and Leaks.” (2015). With Gregory Upton. Southern Economic Association Meeting 2015. New Orleans, Louisiana. November 23.

5. “The Impact of Infrastructure Cost Recovery Mechanisms on Pipeline Replacements and Leaks” (2015). With Gregory Upton. 38th IAEE International Conference, Antalya, Turkey. May 26.

6. “Modifying Renewables Policies to Sustain Positive Economic and Environmental Change” (2015). IEEE Annual Green Technologies (“Greentech”) Conference. April 17.

7. “The Gulf Coast Industrial Investment Renaissance and New CHP Development Opportunities.” (2014). Industrial Energy and Technology Conference, New Orleans, Louisiana. May 20.

8. “Estimating Critical Energy Infrastructure Value at Risk from Coastal Erosion” (2014). With Siddhartha Narra. American’s Estuaries: 7th Annual Summit on Coastal and Estuarine Habitat Restoration. Washington, D.C., November 3-6.

9. “Economies of Scale, Learning Curves, and Offshore Wind Development Costs” (2012). With Gregory Upton. Southern Economic Association Annual Conference, New Orleans, LA November 17.

10. “Analysis of Risk and Post-Hurricane Reaction.” (2009). 25th Annual Information Transfer Meeting. U.S. Department of the Interior, Minerals Management Service. January 7.

11. “Legacy Litigation, Regulation, and Other Determinants of Interstate Drilling Activity Differentials.” (2008). With Christopher Peters and Mark Kaiser. 28th Annual USAEE/IAEE North American Conference: Unveiling the Future of Future of Energy Frontiers. New Orleans, LA, December 3.

12. “Gulf Coast Energy Infrastructure Renaissance: Overview.” (2008). 28th Annual USAEE/IAEE North American Conference: Unveiling the Future of Future of Energy Frontiers. New Orleans, LA, December 3.

13. “Understanding the Impacts of Katrina and Rita on Energy Industry Infrastructure.” (2008). American Chemical Society National Meetings, New Orleans, Louisiana. April 7.

14. "Determining the Economic Value of Coastal Preservation and Restoration on Critical Energy Infrastructure." (2007). With Kristi A. R. Darby and Michelle Barnett. International Association for Energy Economics, Wellington, New Zealand, February 19.

15. “Regulatory Issues in Rate Design, Incentives, and Energy Efficiency.” (2007). 34th Annual Public Utilities Research Center Conference, University of Florida. Gainesville, FL. February 16.

16. “An Examination of LNG Development on the Gulf of Mexico.” (2007). With Kristi A.R. Darby. US Department of the Interior, Minerals Management Service. 24th Annual Information Technology Meeting. New Orleans, LA. January 9.

C23-1811

17. “OCS-Related Infrastructure on the GOM: Update and Summary of Impacts.” (2007). U.S. Department of the Interior, Minerals Management Service. 24th Annual Information Technology Meeting. New Orleans, LA. January 10.

18. “The Economic Value of Coastal Preservation and Restoration on Critical Energy Infrastructure.” (2006). With Michelle Barnett. Third National Conference on Coastal and Estuarine Habitat Restoration. Restore America’s Estuaries. New Orleans, Louisiana, December 11.

19. “The Impact of Implementing a 20 Percent Renewable Portfolio Standard in New Jersey.” (2006). With Seth E. Cureington. Mid-Continent Regional Science Association 37th Annual Conference, Purdue University, Lafayette, Indiana, June 9.

20. “The Impacts of Hurricane Katrina and Rita on Energy infrastructure Along the Gulf Coast.” (2006). Environment Canada: 2006 Artic and Marine Oilspill Program. Vancouver, British Columbia, Canada.

21. “Hurricanes, Energy Markets, and Energy Infrastructure in the Gulf of Mexico: Experiences and Lessons Learned.” (2006). With Kristi A.R. Darby and Seth E. Cureington. 29th Annual IAEE International Conference, Potsdam, Germany, June 9.

22. “An Examination of the Opportunities for Drilling Incentives on State Leases in Louisiana.” (2005). With Kristi A.R. Darby. 28th Annual IAEE International Conference, Taipei, Taiwan (June).

23. “Fiscal Mechanisms for Stimulating Oil and Gas Production on Marginal Leases.” (2004). With Jeffrey M. Burke. International Association of Energy Economics Annual Conference, Washington, D.C. (July).

24. “GIS and Applied Economic Analysis: The Case of Alaska Residential Natural Gas Demand.” (2003). With Dmitry V. Mesyanzhinov. Presented at the Joint Meeting of the East Lakes and West Lakes Divisions of the Association of American Geographers in Kalamazoo, MI, October 16-18.

25. “Are There Any In-State Uses for Alaska Natural Gas?” (2002). With Dmitry V. Mesyanzhinov and William E. Nebesky. IAEE/USAEE 22nd Annual North American Conference: “Energy Markets in Turmoil: Making Sense of It All.” Vancouver, British Columbia, Canada. October 7.

26. “The Economic Impact of State Oil and Gas Leases on Louisiana.” (2002). With Dmitry V. Mesyanzhinov. 2002 National IMPLAN Users’ Conference. New Orleans, Louisiana, September 4-6.

27. “Moving to the Front of the Lines: The Economic Impact of Independent Power Plant Development in Louisiana.” (2002). With Dmitry V. Mesyanzhinov and Williams O. Olatubi. 2002 National IMPLAN Users’ Conference. New Orleans, Louisiana, September 4-6.

28. “New Consistent Approach to Modeling Regional Economic Impacts of Offshore Oil and Gas Activities in the Gulf of Mexico.” (2002). With Vicki Zatarain. 2002 National IMPLAN Users’ Conference. New Orleans, Louisiana, September 4-6.

29. “Distributed Energy Resources, Energy Efficiency, and Electric Power Industry Restructuring.” (1999). American Society of Environmental Science Fourth Annual Conference. Baton Rouge, Louisiana. December.

30. "Estimating Efficiency Opportunities for Coal Fired Electric Power Generation: A DEA Approach." (1999). With Williams O. Olatubi. Southern Economic Association Sixty-ninth Annual Conference. New Orleans, November.

31. "Applied Approaches to Modeling Regional Power Markets." (1999.) With Robert F. Cope. Southern Economic Association Sixty-ninth Annual Conference. New Orleans, November 1999.

32. "Parametric and Non-Parametric Approaches to Measuring Efficiency Potentials in Electric Power Generation." (1999). With Williams O. Olatubi. International Atlantic Economic Society Annual Conference, Montreal, October.

33. "Asymmetric Choice and Customer Benefits: Lessons from the Natural Gas Industry." (1999). With Rachelle F. Cope and Dmitry Mesyanzhinov. International Association of Energy Economics Annual Conference. Orlando, Florida. August.

34. "Modeling Regional Power Markets and Market Power." (1999). With Robert F. Cope. Western Economic Association Annual Conference. San Diego, California. July.

35. "Economic Impact of Offshore Oil and Gas Activities on Coastal Louisiana" (1999). With Dmitry Mesyanzhinov. Annual Meeting of the Association of American Geographers. Honolulu, Hawaii. March.

36. "Empirical Issues in Electric Power Transmission and Distribution Cost Modeling." (1998). With Robert F. Cope and Dmitry Mesyanzhinov. Southern Economic Association. Sixty-Eighth Annual Conference. Baltimore, Maryland. November.

37. "Modeling Electric Power Markets in a Restructured Environment." (1998). With Robert F. Cope and Dan Rinks. International Association for Energy Economics Annual Conference. Albuquerque, New Mexico. October.

38. "Benchmarking Electric Utility Distribution Performance." (1998) With Robert F. Cope and Dmitry Mesyanzhinov. Western Economic Association, Seventy-sixth Annual Conference. Lake Tahoe, Nevada. June.

39. "Power System Operations, Control, and Environmental Protection in a Restructured Electric Power Industry." (1998). With Fred I. Denny. IEEE Large Engineering Systems Conference on Power Engineering. Nova Scotia, Canada. June.

40. "Benchmarking Electric Utility Transmission Performance." (1997). With Robert F. Cope and Dmitry Mesyanzhinov. Southern Economic Association, Sixty-seventh Annual Conference. Atlanta, Georgia. November 21-24.

41. "A Non-Linear Programming Model to Estimate Stranded Generation Investments in a Deregulated Electric Utility Industry." (1997). With Robert F. Cope and Dan Rinks. Institute for Operations Research and Management Science Annual Conference. Dallas Texas. October 26-29.

42. "New Paradigms for Power Engineering Education." (1997). With Fred I. Denny. International Association of Science and Technology for Development, High Technology in the Power Industry Conference. Orlando, Florida. October 27-30

43. "Cogeneration and Electric Power Industry Restructuring." (1997). With Andrew N. Kleit. Western Economic Association, Seventy-fifth Annual Conference. Seattle, Washington. July 9-13.

C23-1813

44. "The Unintended Consequences of the Public Utilities Regulatory Policies Act of 1978." (1997). National Policy History Conference on the Unintended Consequences of Policy Decisions. Bowling Green State University. Bowling Green, Ohio. June 5-7.

45. "Assessing Environmental and Safety Risks of the Expanding Role of Independents in E&P Operations on the Gulf of Mexico OCS." (1996). With Allan Pulsipher, Omowumi Iledare, Dmitry Mesyanzhinov, and Bob Baumann. U.S. Department of Interior, Minerals Management Service, 16th Annual Information Transfer Meeting. New Orleans, Louisiana.

46. "Empirical Modeling of the Risk of a Petroleum Spill During E&P Operations: A Case Study of the Gulf of Mexico OCS." (1996). With Omowumi Iledare, Allan Pulsipher, and Dmitry Mesyanzhinov. Southern Economic Association, Sixty-Sixth Annual Conference. Washington, D.C.

47. "Input Price Fluctuations, Total Factor Productivity, and Price Cap Regulation in the Telecommunications Industry" (1996). With Farhad Niami. Southern Economic Association, Sixty-Sixth Annual Conference. Washington, D.C.

48. "Recovery of Stranded Investments: Comparing the Electric Utility Industry to Other Recently Deregulated Industries" (1996). With Farhad Niami and Dmitry Mesyanzhinov. Southern Economic Association, Sixty-Sixth Annual Conference. Washington, D.C.

49. "Spatial Perspectives on the Forthcoming Deregulation of the U.S. Electric Utility Industry." (1996) With Dmitry Mesyanzhinov. Southwest Association of American Geographers Annual Meeting. Norman, Oklahoma.

50. "Comparing the Safety and Environmental Performance of Offshore Oil and Gas Operators." (1995). With Allan Pulsipher, Omowumi Iledare, Dmitry Mesyanzhinov, William Daniel, and Bob Baumann. U.S. Department of Interior, Minerals Management Service, 15th Annual Information Transfer Meeting. New Orleans, Louisiana.

51. "Empirical Determinants of Nuclear Power Plant Disallowances." (1995). Southern Economic Association, Sixty-Fifth Annual Conference. New Orleans, Louisiana.

52. "A Cross-Sectional Model of IntraLATA MTS Demand." (1995). Southern Economic Association, Sixty-Fifth Annual Conference. New Orleans, Louisiana.

ACADEMIC SEMINARS AND PRESENTATIONS

1. Panelist. "Fuel Security, Resource Adequacy & Value of Transmission." (2019). 6th Annual Electricity Dialogue at Northwestern University: Energy and Capacity: Transitions? Northwestern University Center of Law, Regulation, and Economic Growth.

2. "Air Emissions Regulation and Policy: The Recently Proposed Cross State Air Pollution Rule and the Implications for Louisiana Power Generation." Lecture before School of the Coast & Environment. November 5, 2011.

3. "Energy Regulation: Overview of Power and Gas Regulation." Lecture before School of the Coast & Environment, Course in Energy Policy and Law. October 5, 2009.

4. "Trends and Issues in Renewable Energy." Presentation before the School of the Coast & Environment, Louisiana State University. Spring Guest Lecture Series. May 4, 2007.

5. "CES Research Projects and Status." Presentation before the U.S. Department of the

Interior, Minerals Management Service, Outer Continental Shelf Scientific Committee Meeting, New Orleans, LA May 22, 2007.

6. "Hurricane Impacts on Energy Production and Infrastructure." Presentation Before the 53rd Mineral Law Institute, Louisiana State University. April 7, 2006.

7. "Trends and Issues in the Natural Gas Industry and the Development of LNG: Implications for Louisiana. (2004) 51st Mineral Law Institute, Louisiana State University, Baton Rouge, LA. April 2, 2004.

8. "Electric Restructuring and Conservation." (2001). Presentation before the Department of Electrical Engineering, McNesse State University. Lake Charles, Louisiana. May 2, 2001.

9. "Electric Restructuring and the Environment." (1998). Environment 98: Science, Law, and Public Policy. Tulane University. Tulane Environmental Law Clinic. March 7, New Orleans, Louisiana.

10. "Electric Restructuring and Nuclear Power." (1997). Louisiana State University. Department of Nuclear Science. November 7, Baton Rouge, Louisiana.

11. "The Empirical Determinants of Co-generated Electricity: Implications for Electric Power Industry Restructuring." (1997). With Andrew N. Kleit. Florida State University. Department of Economics: Applied Microeconomics Workshop Series. October 17, Tallahassee, Florida.

PROFESSIONAL AND CIVIC PRESENTATIONS

1. "The role and outlook for CCS in Louisiana energy manufacturing development." (2024). GINP-CCS International Network. February 20, 2024.

2. "Louisiana energy manufacturing development outlook and the energy transition." (2024). Greater Baton Rouge Industry Alliance. February 1, 2024.

3. "Gulf Coast Energy Outlook 2024." (2023). LSU Center for Energy Studies, Baton Rouge, LA, Fall 2023.

4. "Louisiana clean, green industry: reconciling industrial decarbonization, capital formation, and growth." (2023). Louisiana State Bar Association, Public Utility Section. December 1, 2023.

5. "Expert witness training: considerations for preparation and effective execution during public utility regulatory hearings and proceedings." (2023). On the Behalf of the National Association of State Utility Consumer Advocates, Accounting and Finance Subcommittee. September 21, 2023.

6. "Gulf cost energy outlook: traditional resources and the energy transition." (2023). AAPL/Gulf Coast Land Institute Meetings. April 26, 2023.

7. "Ratepayer considerations in the promotion of clean energy." (2023). Public Utility Law Section Roundtable Discussion. April 21, 2023.

8. "Gulf coast energy outlook: traditional resources and the energy transition." (2023). Louisiana Engineering Society. April 19, 2023.

9. "Carbon capture & storage: three thoughts and considerations." (2023). Gulf Coast Power Association. 9th Annual MISO/SPP Conference. March 9, 2023.

10. "Natural gas markets: prices; trends; and ratepayer impacts." (2023). Maryland Energy Advocates Virtual Monthly Meeting. February 17, 2023.

11. "Hydrogen overview and its role in Louisiana decarbonization." (2022). Louisiana Public Service Commission Monthly Business & Executive Meeting. November 17, 2022.

12. "High winter natural gas prices and ratepayer impacts." (2022). National Association of State Utility Consumer Advocates ("NASUCA") Annual Conference. November 14, 2022.

13. "Facing the future together: the Louisiana energy transition, industrial decarbonization, and capital formation trends." (2022). Louisiana Chemical Association: Annual Meeting 2022. October 27, 2022.

14. "Louisiana and the energy transition: reconciling industrial decarbonization, capital formation, and growth." (2022). Louisiana Air and Waste Management 2022 Annual Meeting. October 26, 2022.

15. "The Louisiana energy transition, industrial decarbonization, and industrial capital formation trends." (2022). Postlethwaite & Netterville: 2022 Governmental Update. August 4, 2022.

16. "Identifying and mapping regulatory requirements for CCUS projects." (2022). SECARB Offshore GOM Gulf Regulator Workshop. New Orleans LA. May 16, 2022.

17. "Louisiana industrial decarbonization opportunities." (2022). Louisiana Chemical Association/Louisiana Chemical Industry Alliance Legislative Meeting. May 11, 2022. Baton Rouge, LA.

18. "Natural Gas outlook, 2022: supply, demand, and geopolitical considerations." (2022). National Association of State Utility Consumer Advocates ("NASUCA") Monthly Natural Gas Committee Webinar. March 30, 2022.

19. "Louisiana industrial decarbonization opportunities." (2022). LSU Law School, Journal of Energy Law and Resources Symposium on Energy Transitions. February 4, 2022. Baton Rouge, LA.

20. Panelist. Grid Resiliency in the Era of Extreme Weather. Gulf Coast Power Association 8th Annual MISO/SPP Regional Meeting. February 9, 2022. New Orleans, LA.

21. Panelist. Natural Gas Industry Update. (2022). National Association of State Utility Consumer Advocates Annual Meeting. (virtual). November 8, 2021.

22. "Overview of Louisiana's greenhouse gas emissions and trends." (2021). Louisiana Energy Users Group ("LEUG") Meeting. November 11, 2021.

23. "State of energy in Louisiana: a preview of the 2021 Gulf Coast Energy Outlook." (2021). Financial Planning Association of Baton Rouge. November 10, 2021.

24. "Replacing natural gas and industrial decarbonization: utility and ratemaking issues." (2021). Virtual Joint Annual Meeting: Virginia Committee for Fair Utility Rates, Old Dominion Committee for Fair Utility Rates, and Virginia Industrial Gas Users Group Workshop. September 8, 2021.

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25. "Louisiana 2021 GHG Inventory: Update and summary of preliminary findings." (2021). Presentation before the Climate Initiative Task Force. July 29, 2021.

26. "Opportunities for the development of a hydrogen economy in Louisiana." (2021). Louisiana Energy Climate Solutions Workshop. June 15, 2021.

27. "Natural gas: Building gas system resilience. Overview of the 2021 polar vortex and its implications for gas resiliency." (2021). National Association of State Utility Consumer Advocates ("NASUCA"). Virtual mid-year meeting. June 14, 2021.

28. "Status and briefing on the Louisiana greenhouse gas inventory and emissions analysis." (2021). Scientific Advisory Group ("SAG") Meeting, Governor's Climate Initiative Task Force. March 29, 2021.

29. "Louisiana carbon capture: sinks; sources; and the role of transportation in industrial applications." (2021). LSU Journal of Energy Law & Resources Symposium on Carbon Capture and Solutions. February 5, 2021.

30. "Natural gas outlook, 2021: production, demand, pandemic and policy." (2021). National Association of State Utility Consumer Advocates ("NASUCA") Monthly Natural Gas Committee Webinar. January 20, 2021.

31. "Consumer Perspectives on the Rate Design of the Future." (2020). National Association of State Utility Consumer Advocates ("NASUCA"). Annual Conference, November 10.

32. "Evaluation of Louisiana's Depleted Gas Reservoirs for Geological Carbon Sequestration." (2020). Louisiana Mid-Continent Oil and Gas Association ("LMOGA") Carbon Capture and Underground Storage ("CCUS") Committee Meeting. August 25.

33. "The 2020 Gulf Coast Energy Outlook: COVID-19 update." (2020). Baton Rouge Area Chamber of Commerce Business Webinar. COVID-19 and Global Supply Impacts on the Capital Region and Louisiana Economies. Baton Rouge, LA. June 3.

34. "Ratepayer benefits of reforming PURPA". (2020). Harvard Electricity Policy Group Webinar. PURPA: A time to reform or reduce its role? March 26.

35. "Pipeline industry: economic trends and outlook". (2020). Joint Industry Association Annual Meeting. Louisiana Mid-Continent Oil and Gas Association ("LMOGA") and the Louisiana Oil and Gas Association ("LOGA"). Lake Charles, LA March 5.

36. "The outlook for natural gas: storm clouds ahead?" (2020). National Association of State Utility Consumer Advocates ("NASUCA"). Natural Gas Committee Webinar, February 26.

37. "The 2020 Gulf Coast Energy Outlook". (2020). University of Louisiana Lafayette, Southern Unconventional Resources Center for Excellence. Lafayette, LA February 16.

38. "Opportunities for carbon capture, utilization, and storage in the Louisiana chemical corridor". (2020). Air and Waste Management Association, Louisiana Section Luncheon. Gonzales, LA January 16.

39. Panelist. (2020). Baton Route Advocate, 2020 Economic Outlook Summit. Baton Rouge Advocate. January 8.

40. "2020 Louisiana business climate outlook: the view from the energy sector." (2019). American Council of Engineering Companies Fall Conference. November 21, 2019. Baton Rouge, LA

41. “The urgency of PURPA reform in protecting ratepayers.” (2019). Americans for Tax Reform, Fall 2019 Coalition Leaders Summit, November 14, 2019. New Orleans, LA.

42. “Louisiana’s coast and the energy industry.” (2019). 2019 API Delta Chapter Joint Society Luncheon Meeting. November 12, 2019, New Orleans, LA.

43. “Reforming PURPA: implications for ratepayers.” (2019). Thomas Jefferson Institute for Public Policy, Annual Energy Summit, State Policy Network Annual Meeting. Colorado Springs, CO, October 28.

44. “Natural gas outlook: supply, demand and prices.” (2019). National Association of State Utility Consumer Advocates, Natural Gas Committee Monthly Meeting. July 30, 2019.

45. “The economic impacts and outlook for LNG development on the Gulf Coast.” (2019). 73rd Annual Meeting of the Southern Legislative Conference of the Council of State Governments. New Orleans, LA, July 14. (prepared presentation, hurricane cancellation)

46. “Natural gas outlook: supply, demand, and prices.” (2019). NASUCA Mid-Year Meeting. Portland, OR, June 20.

47. “Overview of Louisiana LNG issues and trends.” (2019). Berlin: LNG, Energy Security, and Diversity Reporting Tour, LSU Center for Energy Studies. Baton Rouge, LA, May 9.

48. “Overview of Louisiana energy issues and outlook.” (2019). Australian Media Visit, Greater New Orleans, Inc./Baton Rouge Area Foundation. Baton Rouge, LA, April 29.

49. “Gulf Coast Energy Outlook 2019: Regional trends and outlook.” (2019). Women’s Energy Network. Baton Rouge, LA, April 23.

50. “MISO Grid Vision 2033.” (2019). 2019 Spring Regulator and Policymaker Forum. New Orleans, LA, April 15-16.

51. “Ratepayer benefits of reforming PURPA.” (2019). LSU Center for Energy Studies Industry Advisory Council Meeting. March 27.

52. “Incentives, risk, and the changing nature of regulation.” (2019). NASUCA Water Committee monthly meeting/webinar. March 13.

53. “Gulf Coast Energy Outlook 2019: Production, trade and infrastructure trends.” (2019). 66th Annual Mineral Board Institute Meetings. Baton Rouge, LA, March 14.

54. “A golden age: energy outlook 2019.” (2019). Engineering News Record Webinar. February 13.

55. Panelist. (2019). Baton Route Advocate, 2019 Economic Outlook Summit. Baton Rouge Advocate. January 8.

56. “MISO Grid Vision 2033.” (2018). 2018 Winter Regulatory and Policymaker Forum. New Orleans, LA, December 11.

57. “Gulf Coast Energy Outlook 2019.” (2018). LSU Center for Energy Studies, Baton Rouge, LA, Fall 2018.

58. “How LNG is transforming Louisiana’s energy economy.” (2018). Louisiana State Bar Association, Public Utility Section. Baton Rouge, LA, November 30.

59. “Overview of Louisiana LNG issues and trends.” (2018). Kean Miller Law Firm: Energy and Environmental Practice Group. Baton Rouge, LA, November 28.

60. “Infrastructure and capacity: challenges for development.” (2018). Society of Utility and Regulatory Financial Analysts (SURFA) Annual Meeting, New Orleans, LA, April 20.

61. “Louisiana industrial cogeneration trends.” (2018). Annual Louisiana Solid Waste Association Conference, Lafayette, LA, March 16.

62. “Gulf Coast industrial development: overview of trends and issues.” (2018). Gulf Coast Power Association Meetings, New Orleans, LA, February 8.

63. “Energy outlook – reflection on market trends and Louisiana implications.” (2017). IberiaBank Corporation Bank Board of Directors Meeting, New Orleans, LA. November 15.

64. “Integrated carbon capture and storage in the Louisiana chemical corridor.” (2017). Industry Associates Advisory Council Meeting, Baton Rouge, LA. November 7.

65. “The outlook for natural gas and energy development on the Gulf Coast.” (2017). Louisiana Chemical Association, Annual Meeting, New Orleans, LA. October 26.

66. “Critical energy infrastructure: the big picture on resiliency research.” (2017). National Academies of Science, Engineering, and Medicine. New Orleans, LA. September 18.

67. “The changing nature of Gulf of Mexico energy infrastructure.” (2017). 27th Gulf of Mexico Region Information Technology Meetings, New Orleans, LA, August 24.

68. “Capacity utilization, efficiency trends, and economic risks for modern CHP installations.” (2017). Industrial Energy Technology Conference, New Orleans, LA. June 21.

69. “Crude oil and natural gas outlook: Where are we and where are we going?” (2017). CCREDC Economic Trends Panel. Corpus Christi, TX, June 15.

70. “Navigating through the energy landscape.” (2017). Baton Rouge Rotary Luncheon. Baton Rouge, LA, May 24.

71. “The 2017-2018 Louisiana energy outlook.” (2017). Junior Achievement of Greater New Orleans, JA BizTown Speaker Series. New Orleans, LA, May 12.

72. “The Gulf Coast energy economy: trends and outlook.” (2017). Society for Municipal Analysts. New Orleans, LA, April 21.

73. “Gulf coast energy outlook.” (2017). E.J. Ourso College of Business, Dean’s Advisory Council, Energy Committee Meeting. Baton Rouge, LA, March 31.

74. “Recent trends in energy: overview and impact for the banking community.” (2017). Oil and Gas Industry Update, Louisiana Bankers Association. Baton Rouge, LA, March 24.

75. “How supply, demand and prices have influenced unconventional development.” (2016). Energy Annual Meeting, CLEER-University Advisory Board Lecture. New Orleans, LA, September 17.

76. “The Basics of Natural Gas Production, Transportation, and Markets.” (2016). Center for Energy Studies. Baton Rouge, LA, August 1.

77. “Gulf Coast industrial development: trends and outlook.” (2016). Investor Relations Group Meeting, Edison Electric Institute. New Orleans, LA, June 23.

78. “The future of policy and regulation: Unlocking the Treasures of Utility Regulation.” (2016). Annual Meeting, National Conference of Regulatory Attorneys. Tampa, FL, June 20.

79. “Utility mergers: where’s the beef?”. (2016). National Association of State Utility Consumer Advocates Mid-Year Meetings. New Orleans, LA, June 6.

80. “Overview of the Clean Power Plan and its application to Louisiana.” (2016). Shell Oil Company Internal Meeting. April 12.

81. “Energy and economic development on the Gulf Coast: trends and emerging challenges.” (2016). Gas Processors Association Meeting. New Orleans, LA, April 11.

82. “Unconventional Oil and Gas Drilling Trends and Issues.” (2016). French Delegation Visit, LSU Center for Energy Studies. March 16.

83. “Gulf Coast Industrial Growth: Passing clouds or storms on the horizon?” (2016). Gulf Coast Power Association Meetings. New Orleans, LA, February 18.

84. “The Transition to Crisis: What do the recent changes in energy markets mean for Louisiana?” (2016). Louisiana Independent Study Group. February 2.

85. “Regulatory and Ratepayer Issues in the Analysis of Utility Natural Gas Reserves Purchases” (2016). National Association of State Utility Consumer Advocates Gas Consumer Monthly Meeting. January 25.

86. “Emerging Issues in Fuel Procurement: Opportunities & Challenges in Natural Gas Reserves Investment.” (2015). National Association of State Utility Consumer Advocates Annual Meeting. Austin, Texas. November 9.

87. “Trends and Issues in Net Metering and Solar Generation.” (2015). Louisiana Rural Electric Cooperative Meeting. November 5.

88. “Electric Power: Industry Overview, Organization, and Federal/State Distinctions.” (2015). EUCI. October 16.

89. “Natural Gas 101: The Basics of Natural Gas Production, Transportation, and Markets.” (2015). Council of State Governments Special Meeting on Gas Markets. New Orleans, LA. October 14.

90. “Update and General Business Matters.” (2015). CES Industry Associates Meeting. Baton Rouge, Louisiana. Fall 2015.

91. “The Impact of Infrastructure Cost Recovery Mechanisms on Pipeline Replacements and Leaks.” (2015). 38th IAEE 2015 International Conference. Antalya, Turkey. May 26.

92. “Industry on the Move – What’s Next?” (2015). Event Sponsored by Regional Bank and 1012 Industry Report. May 5.

93. “The State of the Energy Industry and Other Emerging Issues.” (2015). Lex Mundi Energy & Natural Resources Practice Group Global Meeting. May 5.

94. “Energy, Louisiana, and LSU.” (2015). LSU Science Café. Baton Rouge, Louisiana. April 28.

95. “Energy Market Changes and Impacts for Louisiana.” (2015). Kinetica Partners Shippers Meeting, New Orleans, Louisiana. April 22.

96. “Incentives, Risk and the Changing Nature of Utility Regulation.” (2015). NARUC Staff Subcommittee on Accounting and Finance Meetings, New Orleans, Louisiana. April 22.

97. “Modifying Renewables Policies to Sustain Positive and Economic Change.” (2015). IEEE

Annual Green Technologies (“Greentech Conference”). April 17.

98. “Louisiana’s Changing Energy Environment.” (2015). John P. Laborde Energy Law Center Advisory Board Spring Meeting, Baton Rouge, Louisiana. March 27.

99. “The Latest and the Long on Energy: Outlooks and Implications for Louisiana.” (2015). Iberia Bank Advisory Board Meeting, Baton Rouge, Louisiana. February 23.

100. “A Survey of Recent Energy Market Changes and their Potential Implications for Louisiana.” (2015). Vistage Group, New Orleans, Louisiana. February 4.

101. “Energy Prices and the Outlook for the Tuscaloosa Marine Shale.” (2015). Baton Rouge Rotary Club, Baton Rouge, Louisiana. January 28.

102. “Trends in Energy & Energy-Related Economic Development.” (2014). Miller and Thompson Presentation, Baton Rouge, Louisiana. December 30.

103. “Overview EPA’s Proposed Rule Under Section 111(d) of the Clean Air Act: Impacts for Louisiana.” (2014). Louisiana State Bar: Utility Section CLE Annual Meeting, Baton Rouge, Louisiana. November 7.

104. “Overview EPA’s Proposed Clean Power Plan and Impacts for Louisiana.” (2014). Clean Cities Coalition Meeting, Baton Rouge, Louisiana. November 5.

105. “Impacts on Louisiana from EPA’s Proposed Clean Power Plan.” (2014). Air & Waste Management Annual Environmental Conference (Louisiana Chapter), Baton Rouge, Louisiana. October 29, 2014.

106. “A Look at America’s Growing Demand for Natural Gas.” (2014). Louisiana Chemical Association Annual Meeting, New Orleans, Louisiana. October 23.

107. “Trends in Energy & Energy-Related Economic Development.” (2014). 2014 Government Finance Officer Association Meetings, Baton Rouge, Louisiana. October 9.

108. “The Conventional Wisdom Associated with Unconventional Resource Development.” (2014). National Association for Business Economics Annual Conference, Chicago, Illinois. September 28.

109. Unconventional Oil & Natural Gas: Overview of Resources, Economics & Policy Issues. (2014). Society of Environmental Journalists Annual Meeting. New Orleans, Louisiana. September 4.

110. “Natural Gas Leveraged Economic Development in the South.” (2014). Southern Governors Association Meeting, Little Rock, Arkansas. August 16.

111. “The Past, Present and Future of CHP Development in Louisiana.” (2014). Louisiana Public Service Commission CHP Workshop, Baton Rouge, Louisiana. June 25.

112. “Regional Natural Gas Demand Growth: Industrial and Power Generation Trends.” (2014). Kinetica Partners Shippers Meeting, New Orleans, Louisiana. April 30.

113. “The Technical and Economic Potential for CHP in Louisiana and the Impact of the Industrial Investment Renaissance on New CHP Capacity Development.” (2014). Electric Power 2014, New Orleans, Louisiana. April 1.

114. “Industry Investments and the Economic Development of Unconventional Development.” (2014). Tuscaloosa Marine Shale Conference & Expo, Natchez, Mississippi. March 31.

115. Discussion Panelist. Energy Outlook 2035: The Global Energy Industry and Its Impact on Louisiana, (2014). Grow Louisiana Coalition, Baton Rouge, Louisiana. March 18.

116. "Natural Gas and the Polar Vortex: Has Recent Weather Led to a Structural Change in Natural Gas Markets?" (2014). National Association of State Utility Consumer Advocates Monthly Gas Committee Meeting. February 19.

117. "Some Unconventional Thoughts on Regional Unconventional Gas and Power Generation Requirements." (2014). Gulf Coast Power Association Special Briefing, New Orleans, Louisiana. February 6.

118. "Leveraging Energy for Industrial Development." (2013). 2013 Governor's Energy Summit, Jackson, Mississippi. December 5.

119. "Natural Gas Line Extension Policies: Ratepayer Issues and Considerations." (2013). National Association of State Utility Consumer Advocates Annual Meeting, Orlando, Florida. November 19.

120. "Replacement, Reliability & Resiliency: Infrastructure & Ratemaking Issues in the Power & Natural Gas Distribution Industries." (2013). Louisiana State Bar, Public Utility Section Meetings. November 15.

121. "Natural Gas Markets: Leveraging the Production Revolution into an Industrial Renaissance." (2013). International Technical Conference, Houston, TX. October 11.

122. "Natural Gas, Coal & Power Generation Issues and Trends." (2013). Southeast Labor and Management Public Affairs Committee Conference, Chattanooga, Tennessee. September 27.

123. "Recent Trends in Pipeline Replacement Trackers." (2013). National Association of State Utility Consumer Advocates Monthly Gas Committee Meeting. September 19.

124. Discussion Panelist (2013). Think About Energy Summit, America's Natural Gas Alliance, Columbus Ohio. September 16-17.

125. "Future Test Years: Issues to Consider." (2013). National Regulatory Research Institute, Teleseminar on Future Test Years. August 28.

126. "Industrial Development Outlook for Louisiana." (2013). Louisiana Water Synergy Project Meetings, Jones Walker Law Firm, Baton Rouge, Louisiana. July 30.

127. "Natural Gas & Electric Power Coordination Issues and Challenges." (2013). Utilities State Government Organization Conference, Pointe Clear, Alabama. July 9.

128. "Natural Gas Market Issues & Trends." (2013). Western Conference of Public Service Commissioners, Santa Fe, New Mexico. June 3.

129. "Louisiana Unconventional Natural Gas and Industrial Redevelopment." (2013). Louisiana Chemical Association/Louisiana Chemical Industry Alliance Annual Legislative Conference, Baton Rouge, Louisiana. May 8.

130. "Infrastructure Cost Recovery Mechanism: Overview of Issues." (2013). Energy Bar Association Annual Meeting, Washington, D.C. May 1.

131. "GOM Offshore Oil and Gas." (2013). Energy Executive Roundtable, New Orleans, Louisiana. March 27.

132. "Louisiana Unconventional Natural Gas and Industrial Redevelopment." (2013). Risk Management Association Luncheon, March 21.

133. "Natural Gas Market Update and Emerging Issues." (2013). NASUCA Gas Committee Conference Call/Webinar, March 12.

134. "Unconventional Resources and Louisiana's Manufacturing Development Renaissance." (2013). Baton Rouge Press Club, De La Ronde Hall, Baton Rouge, LA, January 28.

135. "New Industrial Operations Leveraged by Unconventional Natural Gas." (2013) American Petroleum Institute-Louisiana Chapter. Lafayette, LA, Petroleum Club, January 14.

136. "What's Going on with Energy? How Unconventional Oil and Gas Development is Impacting Renewables, Efficiency, Power Markets, and All that Other Stuff." (2012). Atlanta Economics Club Monthly Meeting. Atlanta, GA. December 11.

137. "Trends, Issues, and Market Changes for Crude Oil and Natural Gas." (2012). East Iberville Community Advisory Panel Meeting. St. Gabriel, LA. September 26.

138. "Game Changers in Crude and Natural Gas Markets." (2012). Chevron Community Advisory Panel Meeting. Belle Chase, LA, September 17.

139. "The Outlook for Renewables in a Changing Power and Natural Gas Market." (2012). Louisiana Biofuels and Bioprocessing Summit. Baton Rouge, LA. September 11.

140. "The Changing Dynamics of Crude and Natural Gas Markets." (2012). Chalmette Refining Community Advisory Panel Meeting. Chalmette, LA, September 11.

141. "The Really Big Game Changer: Crude Oil Production from Shale Resources and the Tuscaloosa Marine Shale." (2012). Baton Rouge Chamber of Commerce Board Meeting. Baton Rouge, LA, June 27.

142. "The Impact of Changing Natural Gas Prices on Renewables and Energy Efficiency." (2012). NASUCA Gas Committee Conference Call/Webinar. 12 June 2012.

143. "Issues in Gas-Renewables Coordination: How Changes in Natural Gas Markets Potentially Impact Renewable Development" (2012). Energy Bar Association, Louisiana Chapter, Annual Meeting, New Orleans, LA. April 12, 2012.

144. "Issues in Natural Gas End-Uses: Are We Really Focusing on the Real Opportunities?" (2012). Energy Bar Association, Louisiana Chapter, Annual Meeting, New Orleans, LA. April 12, 2012.

145. "The Impact of Legacy Lawsuits on Conventional Oil and Gas Drilling in Louisiana." (2012). Louisiana Oil and Gas Association Annual Meeting, Lake Charles, LA. February 27, 2012.

146. "The Impact of Legacy Lawsuits on Conventional Oil and Gas Drilling in Louisiana." (2012) Louisiana Oil and Gas Association Annual Meeting. Lake Charles, Louisiana. February 27, 2012.

147. "Louisiana's Unconventional Plays: Economic Opportunities, Policy Challenges. Louisiana Mid-Continent Oil and Gas Association 2012 Annual Meeting. (2012) New Orleans, Louisiana. January 26, 2012.

148. "EPA's Recently Proposed Cross State Air Pollution Rule ("CSAPR") and Its Impacts on Louisiana." (2011). Bossier Chamber of Commerce. November 18, 2011.

149. "Facilitating the Growth of America's Natural Gas Advantage." (2011). BASF U.S. Shale Gas Workshop Management Meeting. Florham Park, New Jersey. November 1, 2011.

150. "CSAPR and EPA Regulations Impacting Louisiana Power Generation." (2011). Air and Waste Management Association (Louisiana Section) Fall Conference. Environmental Focus 2011: a Multi-Media Forum. Baton Rouge, LA. October 25, 2011.

151. "Natural Gas Trends and Impact on Industrial Development." (2011). Central Gulf Coast Industrial Alliance Conference. Arthur R. Outlaw Convention Center. Mobile, AL. September 22, 2011.

152. "Energy Market Changes and Policy Challenges." (2011). Southeast Manpower Tripartite Alliance ("SEMTA") Summer Conference. Nashville, TN September 2, 2011.

153. "EPA Regulations, Rates & Costs: Implications for U.S. Ratepayers." (2011). Workshop: "A Smarter Approach to Improving Our Environment." 38th Annual American Legislative Exchange Council ("ALEC") Meetings. New Orleans, LA. August 5, 2011.

154. Panelist/Moderator. Workshop: "Why Wait? Start Energy Independence Today." 38th Annual American Legislative Exchange Council ("ALEC") Meetings. New Orleans, LA. August 4, 2011.

155. "Facilitating the Growth of America's Natural Gas Advantage." Texas Chemical Council, Board of Directors Summer Meeting. San Antonio, TX. July 28, 2011.

156. "Creating Ratepayer Benefits by Reconciling Recent Gas Supply Opportunities with Past Policy Initiatives." National Association of State Utility Consumer Advocates ("NASUCA"), Monthly Gas Committee Meeting. July 12, 2011.

157. "Energy Market Trends and Policies: Implications for Louisiana." (2011). Lakeshore Lion's Club Monthly Meeting. Baton Rouge, Louisiana. June 20, 2011.

158. "America's Natural Gas Advantage: Securing Benefits for Ratepayers Through Paradigm Shifts in Policy." Southeastern Association of Regulatory Commissioners ("SEARUC") Annual Meeting. Nashville, Tennessee. June 14, 2011.

159. "Learning Together: Building Utility and Clean Energy Industry Partnerships in the Southeast." (2011). American Solar Energy Society National Solar Conference. Raleigh Convention Center, Raleigh, North Carolina. May 20, 2011.

160. "Louisiana Energy Outlook and Trends." (2011). Executive Briefing. Counsul General of Canada. LSU Center for Energy Studies, Baton Rouge, Louisiana. May 24, 2011.

161. "Louisiana's Natural Gas Advantage: Can We Hold It? Grow It? Or Do We Need to be Worrying About Other Problems?" (2011). Louisiana Chemical Association Annual Legislative Conference, Baton Rouge, Louisiana, May 5, 2011.

162. "Energy Outlook and Trends: Implications for Louisiana. (2011). Executive Briefing, Legislative Staff, Congressman William Cassidy. LSU Center for Energy Studies, Baton Rouge, Louisiana. March 25, 2011.

163. "Regulatory Issues in Inflation Adjustment Mechanisms and Allowances." (2011). Gas Committee, National Association of State Utility Consumer Advocates ("NASUCA"). February 15, 2011.

164. "Regulatory Issues in Inflation Adjustment Mechanisms and Allowances." (2010). 2010

Annual Meeting, National Association of State Utility Consumer Advocates (“NASUCA”), Omni at CNN Center, Atlanta, Georgia, November 16, 2010.

165. “How Current and Proposed Energy Policy Impacts Consumers and Ratepayers.” (2010). 122nd Annual Meeting, National Association of Regulatory Utility Commissioners (“NARUC”), Omni at CNN Center, Atlanta, Georgia, November 15, 2010.

166. “Energy Outlook: Trends and Policies.” (2010). 2010 Tri-State Member Service Conference; Arkansas, Louisiana, and Mississippi Electric Cooperatives. L’Auberge du Lac Casino Resort, Lake Charles, Louisiana, October 14, 2010.

167. “Deepwater Moratorium and Louisiana Impacts.” (2010). The Energy Council Annual Meeting. Gulf of Mexico Deepwater Horizon Accident, Response, and Policy. Beau Rivage Conference Center. Biloxi, Mississippi. September 25, 2010.

168. “Overview on Offshore Drilling and Production Activities in the Aftermath of Deepwater Horizon.” (2010) Jones Walker Banking Symposium. The Oil Spill: What Will it Mean for Banks in the Region? New Orleans, Louisiana. August 31, 2010.

169. “Long-Term Energy Sector Impacts from the Oil Spill.” (2010). Second Annual Louisiana Oil & Gas Symposium. The BP Gulf Oil Spill: Long-Term Impacts and Strategies. Baton Rouge Geological Society. August 16, 2010.

170. “Overview and Issues Associated with the Deepwater Horizon Accident.” (2010). Global Interdependence Meeting on Energy Issues. Baton Rouge, LA. August 12, 2010.

171. “Overview and Issues Associated with the Deepwater Horizon Accident.” (2010). Regional Roundtable Webinar. National Association for Business Economics. August 10, 2010.

172. “Deepwater Moratorium: Overview of Impacts for Louisiana.” Louisiana Association of Business and Industry Meeting. Baton Rouge, LA. June 25, 2010.

173. Moderator. Senior Executive Roundtable on Industrial Energy Efficiency. U.S. Department of Energy Conference on Industrial Efficiency. Office of Renewable Energy and Energy Efficiency. Royal Sonesta Hotel, New Orleans, LA. May 21, 2010.

174. “The Energy Outlook: Trends and Policies Impacting Southeastern Natural Gas Supply and Demand Growth.” Second Annual Local Economic Analysis and Research Network (“LEARN”) Conference. Federal Reserve Bank of Atlanta. March 29, 2010.

175. “Natural Gas Supply Issues: Gulf Coast Supply Trends and Implications for Louisiana.” Energy Bar Association, New Orleans Chapter Meeting. Jones Walker Law Firm. January 28, 2010, New Orleans, LA.

176. “Potential Impacts of Federal Greenhouse Gas Legislation on Louisiana Industry.” LCA Government Affairs Committee Meeting. November 10, 2009. Baton Rouge, LA

177. “Regulatory and Ratemaking Issues Associated with Cost and Revenue Tracker Mechanisms.” National Association of State Utility Consumer Advocates (“NASUCA”) Annual Meeting. November 10, 2009.

178. “Louisiana’s Stakes in the Greenhouse Gas Debate.” Louisiana Chemical Association and Louisiana Chemical Industry Alliance Annual Meeting: The Billing Dollar Budget Crisis: Catastrophe or Change? New Orleans, LA.

179. “Gulf Coast Energy Outlook: Issues and Trends.” Women’s Energy Network, Louisiana

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Chapter. September 17, 2009. Baton Rouge, LA.

180. "Gulf Coast Energy Outlook: Issues and Trends." Natchez Area Association of Energy Service Companies. September 15, 2009, Natchez, MS.

181. "The Small Picture: The Cost of Climate Change to Louisiana." Louisiana Association of Business and Industry, U.S. Chamber of Commerce, Louisiana Oil and Gas Association, and LSU Center for Energy Studies Conference: Can Louisiana Make a Buck After Climate Change Legislation? August 21, 2009. Baton Rouge, LA.

182. "Carbon Legislation and Clean Energy Markets: Policy and Impacts." National Association of Conservation Districts, South Central Region Meeting. August 14, 2009. Baton Rouge, LA.

183. "Evolving Carbon and Clean Energy Markets." The Carbon Emissions Continuum: From Production to Consumption." Jones Walker Law Firm and LSU Center for Energy Studies Workshop. June 23, 2009. Baton Rouge, LA

184. "Potential Impacts of Cap and Trade on Louisiana Ratepayers: Preliminary Results." (2009). Briefing before the Louisiana Public Service Commission. Business and Executive Meeting, May 12, 2009. Baton Rouge, LA.

185. "Natural Gas Outlook." (2009). Briefing before the Louisiana Public Service Commission. Business and Executive Meeting, May 12, 2009. Baton Rouge, LA.

186. "Gulf Coast Energy Outlook: Issues and Trends." (2009). ISA-Lafayette Technical Conference & Expo. Cajundome Conference Center. Lafayette, Louisiana. March 12, 2009.

187. "The Cost of Energy Independence, Climate Change, and Clean Energy Initiatives on Utility Ratepayers." (2009). National Association of Business Economics (NABE). 25th Annual Washington Economic Policy Conference: Restoring Financial and Economic Stability. Arlington, VA March 2, 2009.

188. Panelist, "Expanding Exploration of the U.S. OCS" (2009). Deep Offshore Technology International Conference and Exhibition. PennWell. New Orleans, Louisiana. February 4, 2009.

189. "Gulf Coast Energy Outlook." (2008.) Atmos Energy Regional Management Meeting. Louisiana and Mississippi Division. New Orleans, Louisiana. October 8, 2008.

190. "Background, Issues, and Trends in Underground Hydrocarbon Storage." (2008). Presentation before the LSU Center for Energy Studies Industry Advisory Board Meeting. Baton Rouge, Louisiana. August 27, 2008.

191. "Greenhouse Gas Regulations and Policy: Implications for Louisiana." (2008). Presentation before the Praxair Customer Seminar. Houston, Texas, August 14, 2008.

192. "Market and Regulatory Issues in Alternative Energy and Louisiana Initiatives." (2008). Presentation before the 2008 Statewide Clean Cities Coalition Conference: Making Sense of Alternative Fuels and Advanced Technologies. New Orleans, Louisiana, March 27, 2008.

193. "Regulatory Issues in Rate Design, Incentives, and Energy Efficiency." (2007) Presentation before the New Hampshire Public Utilities Commission. Workshop on Energy Efficiency and Revenue Decoupling. November 7, 2007.

194. "Regulatory Issues for Consumer Advocates in Rate Design, Incentives, and Energy Efficiency." (2007). National Association of State Utility Consumer Advocates, Mid-Year Meeting. June 12, 2007.

195. "Regulatory and Policy Issues in Nuclear Power Plant Development." (2007). LSU Center for Energy Studies Industry Advisory Council Meeting. Baton Rouge, LA. March 23, 2007.

196. "Oil and Gas in the Gulf of Mexico: A North American Perspective." (2007). Canadian Consulate, Heads of Mission EnerNet Workshop, Houston, Texas. March 20, 2007.

197. "Regulatory Issues for Consumer Advocates in Rate Design, Incentives & Energy Efficiency. (2007). National Association of State Utility Consumer Advocates ("NASUCA") Gas Committee Monthly Meeting. February 13, 2006.

198. "Recent Trends in Natural Gas Markets." (2006). National Association of Regulatory Utility Commissioners, 118th Annual Convention. Miami, FL November 14, 2006.

199. "Energy Markets: Recent Trends, Issues & Outlook." (2006). Association of Energy Service Companies (AESC) Meeting. Petroleum Club, Lafayette, LA, November 8, 2006.

200. "Energy Outlook" (2006). National Business Economics Issues Council. Quarterly Meeting, Nashville, TN, November 1-2, 2006.

201. "Global and U.S. Energy Outlook." (2006). Energy Virginia Conference. Virginia Military Institute, Lexington, VA October 17, 2006.

202. "Interdependence of Critical Energy Infrastructure Systems." (2006). Cross Border Forum on Energy Issues: Security and Assurance of North American Energy Systems. Woodrow Wilson Center for International Scholars. Washington, DC, October 13, 2006.

203. "Determining the Economic Value of Coastal Preservation and Restoration on Critical Energy Infrastructure." (2006) The Economic and Market Impacts of Coastal Restoration: America's Wetland Economic Forum II. Washington, DC September 28, 2006.

204. "Relationships between Power and Other Critical Energy Infrastructure." (2006). Rebuilding the New Orleans Region: Infrastructure Systems and Technology Innovation Forum. United Engineering Foundation. New Orleans, LA, September 24-25, 2006.

205. "Outlook, Issues, and Trends in Energy Supplies and Prices." (2006.) Presentation to the Southern States Energy Board, Associate Members Meeting. New Orleans, Louisiana. July 14, 2006.

206. "Energy Sector Outlook." (2006). Baton Rouge Country Club Meeting. Baton Rouge, Louisiana. July 11, 2006.

207. "Oil and Gas Industry Post 2005 Storm Events." (2006). American Petroleum Institute, Teche Chapter. Production, Operations, and Regulations Annual Meeting. Lafayette, Louisiana. June 29, 2006.

208. "Concentration of Energy Infrastructure in Hurricane Regions." (2006). Presentation before the National Commission on Energy Policy Forum: Ending the Stalemate on LNG Facility Siting. Washington, DC. June 21, 2006.

209. "LNG—A Premier." (2006). Presentation Given to the U.S. Department of Energy's "LNG Forums." Los Angeles, California. June 1, 2006.

210. "Regional Energy Infrastructure, Production and Outlook." (2006). Executive Briefing for

Board of Directors, Louisiana Oil and Gas Plc., Enhanced Exploration, Inc. and Energy Self-Service, Inc. Covington, Louisiana, May 12, 2006.

211. "The Impacts of the Recent Hurricane Season on Energy Production and Infrastructure and Future Outlook." Presentation before the Industrial Energy Technology Conference 2006. New Orleans, Louisiana, May 9, 2006.

212. "Update on Regional Energy Infrastructure and Production." (2006). Executive Briefing for Delegation Participating in U.S. Department of Commerce Gulf Coast Business Investment Mission. Baton Rouge, Louisiana May 5, 2006.

213. "Hurricane Impacts on Energy Production and Infrastructure." (2006). Presentation before the Interstate Natural Gas Association of America Mid-Year Meeting. Hyatt Regency Hill Country. April 21, 2006.

214. "LNG—A Premier." Presentation Given to the U.S. Department of Energy's "LNG Forums." Astoria, Washington. April 28, 2006.

215. Natural Gas Market Outlook. Invited Presentation Given to the Georgia Public Service Commission and Staff. Georgia Institute of Technology, Atlanta, Georgia. March 10, 2006.

216. The Impacts of Hurricanes Katrina and Rita on Louisiana's Energy Industry. Presentation to the Louisiana Economic Development Council. Baton Rouge, Louisiana. March 8, 2006.

217. Energy Markets: Hurricane Impacts and Outlook. Presentation to the 2006 Louisiana Independent Oil and Gas Association Annual Conference. L'Auberge du Lac Resort and Casino. Lake Charles, Louisiana. March 6, 2006

218. Energy Market Outlook and Update on Hurricane Damage to Energy Infrastructure. Presentation to the Energy Council 2005 Global Energy and Environmental Issues Conference. Santa Fe, New Mexico, December 10, 2005.

219. "Putting Our Energy Infrastructure Back Together Again." Presentation Before the 117th Annual Convention of the National Association of Regulatory Utility Commissioners (NARUC). November 15, 2005. Palm Springs, CA

220. "Hurricanes and the Outlook for Energy Markets." Presentation before the Baton Rouge Rotary Club. November 9, 2005, Baton Rouge, LA.

221. "Hurricanes, Energy Supplies and Prices." Presentation before the Louisiana Department of Natural Resources and Atchafalaya Basin Committee Meeting. November 8, 2005. Baton Rouge, LA.

222. "The Impact of the Recent Hurricane's on Louisiana's Energy Industry." Presentation before the Louisiana Independent Oil and Gas Association Board of Directors Meeting. November 8, 2005. Baton Rouge, LA.

223. "The Impact of the Recent Hurricanes on Louisiana's Infrastructure and National Energy Markets." Presentation before the Baton Rouge City Club Distinguished Speaker Series. October 13, 2005. Baton Rouge, LA.

224. "The Impact of the Recent Hurricanes on Louisiana's Infrastructure and National Energy Markets." Presentation before Powering Up: A Discussion About the Future of Louisiana's

Energy Industry. Special Lecture Series Sponsored by the Kean Miller Law Firm. October 13, 2005. Baton Rouge, LA.

225. "The Impact of Hurricane Katrina on Louisiana's Energy Infrastructure and National Energy Markets." Special Lecture on Hurricane Impacts, LSU Center for Energy Studies, September 29, 2005.

226. "Louisiana Power Industry Overview." Presentation before the Clean Air Interstate Rule Implementation Stakeholders Meeting. August 11, 2005. Louisiana Department of Environmental Quality.

227. "CES 2005 Legislative Support and Outlook for Energy Markets and Policy." Presentation before the LMOGA/LCA Annual Post-Session Legislative Committee Meeting. August 10-13, 2005. Perdido Key, Florida.

228. "Electric Restructuring: Past, Present, and Future." Presentation to the Southeastern Association of Tax Administrators Annual Conference. Sheraton Hotel and Conference Facility. New Orleans, LA July 12, 2005.

229. "The Outlook for Energy." Lagniappe Studies Continuing Education Course. Baton Rouge, LA. July 11, 2005.

230. "The Outlook for Energy." Sunshine Rotary Club. Baton Rouge, LA. April 27, 2005.

231. "Background and Overview of LNG Development." Energy Council Workshop on LNG/CNG. Biloxi, Ms: Beau Rivage Resort and Hotel, April 9, 2005.

232. "Natural Gas Supply, Prices, and LNG: Implications for Louisiana Industry." Cytec Corporation Community Advisory Panel. Fortier, LA January 14, 2005.

233. "The Economic Opportunities for a Limited Industrial Retail Choice Plan." Louisiana Department of Economic Development. Baton Rouge, Louisiana. November 19, 2004.

234. "Energy Issues for Industrial Customers of Gas and Power." Louisiana Association of Business and Industry, Energy Council Meeting. Baton Rouge, Louisiana. October 11, 2004.

235. "Energy Issues for Industrial Customers of Gas and Power." Annual Meeting of the Louisiana Chemical Association and the Louisiana Chemical Industry Alliance. Point Clear, Alabama. October 8, 2004.

236. "Energy Issues for Industrial Customers of Gas and Power." American Institute of Chemical Engineers – New Orleans Section. New Orleans, LA. September 22, 2004.

237. "Natural Gas Supply, Prices and LNG: Implications for Louisiana Industry." Dow Chemical Company Community Advisory Panel Meeting. Plaquemine, LA. August 9, 2004.

238. "Energy Issues for Industrial Customers of Gas and Power." Louisiana Chemical Association Post-Legislative Meeting. Springfield, LA. August 9, 2004.

239. "LNG In Louisiana." Joint Meeting of the Louisiana Economic Development Council and the Governors Cabinet Advisory Council. Baton Rouge, LA. August 5, 2004.

240. "Louisiana Energy Issues." Louisiana Mid-Continent Oil and Gas Association Post Legislative Meetings. Sandestin, Florida. July 28, 2004.

241. “The Gulf South: Economic Opportunities Related to LNG.” Presentation before the Energy Council’s 2004 State and Provincial Energy and Environmental Trends Conference. Point Clear, AL, June 26, 2004.

242. “Natural Gas and LNG Issues for Louisiana.” Presentation before the Rhodia Community Advisory Panel. May 20, 2004, Baton Rouge, LA.

243. “The Economic Opportunities for LNG Development in Louisiana.” Presentation before the Louisiana Chemical Association Plant Managers Meeting. May 27, 2004. Baton Rouge, LA.

244. The Economic Opportunities for LNG Development in Louisiana.” Presentation before the Louisiana Chemical Association/Louisiana Chemical Industry Alliance Legislative Conference. May 26, 2004. Baton Rouge, LA.

245. “The Economic Opportunities for LNG Development in Louisiana.” Presentation before the Petrochemical Industry Cluster, Greater New Orleans, Inc. May 19, 2004, Destrehan, LA.

246. “Industry Development Issues for Louisiana: LNG, Retail Choice, and Energy.” Presentation before the LSU Center for Energy Studies Industry Associates. May 14, 2004, Baton Rouge, LA.

247. “The Economic Opportunities for LNG Development in Louisiana.” Presentation before the Board of Directors, Greater New Orleans, Inc. May 13, 2004, New Orleans, LA.

248. “Natural Gas Outlook: Trends and Issues for Louisiana.” Presentation before the Louisiana Joint Agricultural Association Meetings. January 14, 2004, Hotel Acadiana, Lafayette, Louisiana.

249. “Natural Gas Outlook” Presentation before the St. James Parish Community Advisory Panel Meeting. January 7, 2004, IMC Production Facility, Convent, Louisiana.

250. “Competitive Bidding in the Electric Power Industry.” Presentation before the Association of Energy Engineers. Business Energy Solutions Expo. December 11-12, 2003, New Orleans, Louisiana.

251. “Regional Transmission Organization in the South: The Demise of SeTrans” Presentation before the LSU Center for Energy Studies Industry Associates Advisory Council Meeting. December 9, 2003. Baton Rouge, Louisiana.

252. “Affordable Energy: The Key Component to a Strong Economy.” Presentation before the National Association of Regulatory Utility Commissioners (“NARUC”), November 18, 2003, Atlanta, Georgia.

253. “Natural Gas Outlook.” Presentation before the Louisiana Chemical Association, October 17, 2003, Pointe Clear, Alabama.

254. “Issues and Opportunities with Distributed Energy Resources.” Presentation before the Louisiana Biomass Council. April 17, 2003, Baton Rouge, Louisiana.

255. “What’s Happened to the Merchant Energy Industry? Issues, Challenges, and Outlook” Presentation before the LSU Center for Energy Studies Industry Associates Advisory Council Meeting. November 12, 2002. Baton Rouge, Louisiana.

256. "An Introduction to Distributed Energy Resources." Presentation before the U.S. Department of Energy, Office of Renewable Energy and Energy Efficiency, State Energy Program/Rebuild America Conference, August 1, 2002, New Orleans, Louisiana.

257. "Merchant Energy Development Issues in Louisiana." Presentation before the Program Committee of the Center for Legislative, Energy, and Environmental Research (CLEER), Energy Council. April 19, 2002.

258. "Merchant Power Plants and Deregulation: Issues and Impacts." Presentation before 24th Annual Conference on Waste and the Environment. Sponsored by the Louisiana Department of Environmental Quality. Lafayette, Louisiana, Cajundome. March 18, 2002.

259. "Merchant Power and Deregulation: Issues and Impacts." Presentation before the Air and Waste Management Association Annual Meeting. Baton Rouge, LA, November 15, 2001.

260. "Moving to the Front of the Lines: The Economic Impact of Independent Power Production in Louisiana." Presentation before the LSU Center for Energy Studies Merchant Power Generation and Transmission Conference, Baton Rouge, LA. October 11, 2001.

261. "Economic Impacts of Merchant Power Plant Development in Mississippi." Presentation before the U.S. Oil and Gas Association Annual Oil and Gas Forum. Jackson, Mississippi. October 10, 2001.

262. "Economic Opportunities for Merchant Power Development in the South." Presentation before the Southern Governor's Association/Southern State Energy Board Meetings. Lexington, KY. September 9, 2001.

263. "The Changing Nature of the Electric Power Business in Louisiana." Presentation before the Louisiana Department of Environmental Quality. Baton Rouge, LA, August 27, 2001.

264. "Power Business in Louisiana: Background and Issues." Presentation before the Louisiana Interagency Group on Merchant Power Development . Baton Rouge, LA, July 16, 2001.

265. "The Changing Nature of the Electric Power Business in Louisiana: Background and Issues." Presentation before the Louisiana Office of the Governor. Baton Rouge, LA, July 16, 2001.

266. "The Changing Nature of the Electric Power Business in Louisiana: Background and Issues." Presentation before the Louisiana Department of Economic Development. Baton Rouge, LA, July 3, 2001.

267. "The Economic Impacts of Merchant Power Plant Development In Mississippi." Presentation before the Mississippi Public Service Commission. Jackson, Mississippi, March 20, 2001.

268. "Energy Conservation and Electric Restructuring." With Ritchie D. Priddy. Presentation before the Louisiana Department of Natural Resources. Baton Rouge, Louisiana, October 23, 2000.

269. "Pricing and Regulatory Issues Associated with Distributed Energy." Joint Conference by Econ One Research, Inc., the Louisiana State University Distributed Energy Resources Initiative, and the University of Houston Energy Institute: "Is the Window Closing for Distributed Energy?" Houston, Texas, October 13, 2000.

270. "Electric Reliability and Merchant Power Development Issues." Technical Meetings of the Louisiana Public Service Commission. Baton Rouge, LA. August 29, 2000.

271. "A Introduction to Distributed Energy Resources." Summer Meetings, Southeastern Association of Regulatory Utility Commissioners (SEARUC). New Orleans, LA. June 27, 2000.

272. Roundtable Moderator/Discussant. Mid-South Electric Reliability Summit. U.S. Department of Energy. New Orleans, Louisiana. April 24, 2000.

273. "Electricity 101: Definitions, Precedents, and Issues." Energy Council's 2000 Federal Energy and Environmental Matters Conference. Loews L'Enfant Plaza Hotel, Washington, D.C. March 11-13, 2000.

274. "LSU/CES Distributed Energy Resources Initiatives." Los Alamos National Laboratories. Office of Energy and Sustainable Systems. Los Alamos, New Mexico. February 16, 2000.

275. "Distributed Energy Resources Initiatives." Louisiana State University, Center for Energy Studies Industry Associates Meeting. Baton Rouge, Louisiana. December 15, 1999.

276. "Merchant Power Opportunities in Louisiana." Louisiana Mid-Continent Oil and Gas Association (LMOGA) Power Generation Committee Meetings. Baton Rouge, Louisiana. November 10, 1999.

277. Roundtable Discussant. "Environmental Regulation in a Restructured Market" The Big E: How to Successfully Manage the Environment in the Era of Competitive Energy. PUR Conference. New Orleans, Louisiana. May 24, 1999.

278. "The Political Economy of Electric Restructuring In the South" Southeastern Electric Exchange, Rate Section Annual Conference. New Orleans, Louisiana. May 7, 1999.

279. "The Dynamics of Electric Restructuring in Louisiana." Joint Meeting of the American Association of Energy Engineers and the International Association of Facilities Managers. Metairie, Louisiana. April 29, 1999.

280. "The Implications of Electric Restructuring on Independent Oil and Gas Operations." Petroleum Technology Transfer Council Workshop: Electrical Power Cost Reduction Methods in Oil and Gas Field Operations. Lafayette, Louisiana, March 24, 1999.

281. "What's Happened to Electricity Restructuring in Louisiana?" Louisiana State University, Center for Energy Studies Industry Associates Meeting. March 22, 1999.

282. "A Short Course on Electric Restructuring." Central Louisiana Electric Company. Sales and Marketing Division. Mandeville, Louisiana, October 22, 1998.

283. "The Implications of Electric Restructuring on Independent Oil and Gas Operations." Petroleum Technology Transfer Council Workshop: Electrical Power Cost Reduction Methods in Oil and Gas Field Operations. Shreveport, Louisiana, October 13, 1998.

284. "How Will Utility Deregulation Affect Tourism." Louisiana Travel Promotion Association Annual Meeting, Alexandria, Louisiana. January 15, 1998.

285. "Reflections and Predictions on Electric Utility Restructuring in Louisiana." With Fred I. Denny. Louisiana State University, Center for Energy Studies Industry Associates Meeting. November 20, 1997.

C23-1832

286. "Electric Utility Restructuring in Louisiana." Hammond Chamber of Commerce, Hammond, Louisiana. October 30, 1997.

287. "Electric Utility Restructuring." Louisiana Association of Energy Engineers. Baton Rouge, Louisiana. September 11, 1997.

288. "Electric Utility Restructuring: Issues and Trends for Louisiana." Opelousas Chamber of Commerce, Opelousas, Louisiana. June 24, 1997.

289. "The Electric Utility Restructuring Debate In Louisiana: An Overview of the Issues." Annual Conference of the Public Affairs Research Council of Louisiana. Baton Rouge, Louisiana. March 25, 1997.

290. "Electric Restructuring: Louisiana Issues and Outlook for 1997." Louisiana State University, Center for Energy Studies Industry Associates Meeting, Baton Rouge, Louisiana, January 15, 1997.

291. "Restructuring the Electric Utility Industry." Louisiana Propane Gas Association Annual Meeting, Alexandria, Louisiana, December 12, 1996.

292. "Deregulating the Electric Utility Industry." Eighth Annual Economic Development Summit, Baton Rouge, Louisiana, November 21, 1996.

293. "Electric Utility Restructuring in Louisiana." Jennings Rotary Club, Jennings, Louisiana, November 19, 1996.

294. "Electric Utility Restructuring in Louisiana." Entergy Services, Transmission and Distribution Division, Energy Centre, New Orleans, Louisiana, September 12, 1996

295. "Electric Utility Restructuring" Louisiana Electric Cooperative Association, Baton Rouge, Louisiana, August 27, 1996.

296. "Electric Utility Restructuring -- Background and Overview." Louisiana Public Service Commission, Baton Rouge, Louisiana, August 14, 1996.

297. "Electric Utility Restructuring." Sunshine Rotary Club Meetings, Baton Rouge, Louisiana, August 8, 1996.

298. Roundtable Moderator, "Stakeholder Perspectives on Electric Utility Stranded Costs." Louisiana State University, Center for Energy Studies Seminar on Electric Utility Restructuring in Louisiana, Baton Rouge, May 29, 1996.

299. Panelist, "Deregulation and Competition." American Nuclear Society: Second Annual Joint Louisiana and Mississippi Section Meetings, Baton Rouge, Louisiana, April 20, 1996.

EXPERT WITNESS, LEGISLATIVE, AND PUBLIC TESTIMONY; EXPERT REPORTS, RECOMMENDATIONS, AND AFFIDAVITS

1. Expert Testimony. Docket No. 20240026. (2024). Before the Florida Public Service Commission. *In Re: Petition for rate increase by Tampa Electric Company.* On Behalf of The Citizens of the State of Florida. Issues: load forecasting, affordability.

2. Expert Testimony. Docket No. 2024-34-E. (2024). Before the Public Service Commission of South Carolina. *In the Matter of: Application of Dominion Energy South Carolina, incorporated for authority to adjust and increase its retail electric rate schedules tariffs, and terms and conditions.* On Behalf of South Carolina Department of Consumer Affairs.

Issues: GRID investment, cost of service, revenue allocation, rate design.

3. Expert Testimony. Cause No. 46011. (2024). Before the State of Indiana, Indiana Utility Regulatory Commission. *Petition of Ohio Valley Gas, Inc. for (1) authority to increase its rates and charges for gas utility service, (2) approval of new schedules of rates and charges, (3) approval of decoupling through a new sales reconciliation component rider, and (4) approval of necessary and appropriate accounting relief and other requests.* On Behalf of Indiana Office of Utility Consumer Counselor. Issues: decoupling, sales reconciliation component rider.

4. Expert Testimony. Docket No. 2024-UA-42. (2024). Before the Mississippi Public Service Commission. *Joint Application of Centerpoint Energy Resources Corp. and Delta Utilities MS, LLC for all necessary authorizations and approvals for Delta Utilities MS, LLC to acquire the assets of Centerpoint Energy Resources Corp. and for approval of a certificate of public convenience and necessity for Delta Utilities MS, LLC, and for related relief.* On Behalf of Delta Utilities MS, LLC. Issues: economic benefits, ratemaking, other benefits.

5. Expert Testimony. Docket No. S-37187. (2024). Before the Louisiana Public Service Commission. *Delta Utilities No. LA, LLC, Delta Utilities S. LA., and Centerpoint Energy Resources Corp. Ex. Parte. In RE : Application for authority to operate as a local distribution company and incur indebtedness and joint application for approval for transfer and acquisition of local distribution company assets and related relief.* On Behalf of Delta Utilities No. LA, LLC. Issues: economic benefits, ratemaking, other benefits.

6. Expert Testimony. D.P.U. 23-150. (2024). Before the Commonwealth of Massachusetts Department of Public Utilities. *Petition of Massachusetts Electric Company and Nantucket Electric Company each d/b/a National Grid Pursuant to G.L. c. 164 § 94 and 220 C.M.R. 5.00 for Approval of an Increase in Base Distribution Ratesand Approval of a Performance-Based Ratemaking Plan.* On Behalf of the Massachusetts Office of the Attorney General, Office of Ratepayer Advocacy. Issues: capital tracker, Y-factor, IDRF, PBR, alternative regulation, benchmarking analysis.

7. Expert Testimony. Cause No. 45990. (2024). Before the Indiana Utility Regulatory Commission. *Verified Petition of Southern Indiana Gas and Electric Company D/B/A Centerpoint Energy Indiana South (“CEI South) for (1) Authority to modify its rates and charges for electric utility service through a phase in of rates (2) approval of new schedules of rates and charges and new and revised riders, including but not limited to a new tax adjustment rider and a new green power rider (3) approval of a critical peak pricing (“CPP”) pilot program, (4) approval of revised depreciation rates applicable to electric and common plant in service, (5) approval of necessary and appropriate accounting relief, including authority to capitalize as rate base all cloud computing costs and defer to a regulatory asset amounts not already included in base rates that are incurred for third-party cloud computing arrangements, and (6) approval of an alternative regulatory plant granting CEI South a waiver from 170 IAC 4-1-16(f) to allow for remote disconnection for non-payment.* On Behalf of Indiana Office of Utility Consumer Counselor. Issues: proposed rate increases, cost of service study, minimum system study, revenue distribution, rate design, TOU-CPP pilot.

8. Expert Testimony. Cause No. 45967. (2024). Before the Indiana Utility Regulatory Commission. *Petition of Northern Indiana Public Service Company LLC Pursuant to Ind. Code §§ 8-1-2-42, 8-1-2-42.7 and 8-1-2-61 for (1) authority to modify its retail rates and*

charges for gas utility service through a phase in of rates; (2) approval of new schedules of rates and charges, general rule sand regulations, and riders (both existing and new): (3) approval of a new sales reconciliation adjustment mechanism; (4) approval of revised gas deprecation rates applicable to its gas plant in service; (5) approval of necessary and appropriate accounting relief, including but not limited to approval of certain deferral mechanisms for pensions, other post-retirement benefits and line locate expenses; and (6) to the extent necessary, approval of any of the relief requested herein pursuant to Ind. Code Ch. 8-1-2-5. On Behalf of Indiana Office of Utility Consumer Counselor. Issues: sales reconciliation adjustment.

9. Expert Testimony. F.C. No. 1176. (2024). Before the Public Service Commission of the District of Columbia. *In the Matter of the Application of Potomac Electric Power Company for Authority to Implement a Multiyear Rate Plan for Electric Distribution Service in the District of Columbia.* On Behalf of the Office of the People's Counsel for the District of Columbia. Issues: affordability, revenue distribution, rate design, multi-year rate planning, bill stabilization adjustment.

10. Expert Testimony. Case No. 23-0460-E-42T (2023). Before the Public Service Commission of West Virginia Charleston. *In the Matter of Monongahela Power Company and the Potomac Edison Company rule 42T tariff filing to increase rates and charges.* On Behalf of the Consumer Advocate Division of the Public Service Commission of West Virginia. Issues: cost of service, zero intercept study, revenue allocation, rate design, net energy metering rider.

11. Expert Testimony. Docket No. DPU 23-81. (2023). Before the Commonwealth of Massachusetts Department of Public Utilities. *Petition of Fitchburg Gas and Electric Light Company d/b/a Unitil (Gas Division), pursuant to G.L. c. 164, § 94 and 220 CMR 5.00, for Approval of a General Increase in Base Distribution Rates for Gas Service and a Performance-Based Ratemaking Plan.* On Behalf of the Massachusetts Office of the Attorney General, Office of Ratepayer Advocacy. Direct and Surrebuttal. Issues: alternative regulation performance-based ratemaking, cost of service, revenue distribution, rate design.

12. Expert Testimony. Docket No. DPU 23-80. (2023). Before the Commonwealth of Massachusetts Department of Public Utilities. *Petition of Fitchburg Gas and Electric Light Company d/b/a Unitil (Electric Division), pursuant to G.L. c. 164, § 94 and 220 CMR 5.00, for Approval of a General Increase in Base Distribution Rates for Electric Service and a Performance-Based Ratemaking Plan.* On Behalf of the Massachusetts Office of the Attorney General, Office of Ratepayer Advocacy. Direct and Surrebuttal. Issues: alternative regulation performance-based ratemaking, cost of service, revenue distribution, rate design.

13. Expert Testimony. Case No. 23-03803-W-42T and 23-0384-S-42T (2023). Before the Public Service Commission of West Virginia Charleston. In the Matter of West Virginia-America Water Company rule 42T application to increase rates and charges. On Behalf of the Consumer Advocate Division of the Public Service Commission of West Virginia. Issues: revenue distribution, rate design, affordability, service quality.

14. Expert Testimony. Cause No. 45933 (2023). Before the Indiana Utility Regulatory Commission. *Petition of Indiana Michigan Power Company an Indiana Corporation, for authority to increase rates and charges for electric utility service through a phase in rate*

adjustment; and for approval of related relief including: (1) revised depreciation rates, including cost of removal less salvage, and updated depreciation expense; (2) accounting relief, including deferrals and amortization; (3) inclusion of capital investment; (4) rate adjustment mechanism proposals, including new grant projects rider and modified tax rider; (5) a voluntary residential customer powerpay program; (6) waiver or declination of jurisdiction with respect to certain rules to facilitate implementation of the powerpay program; (7) cost recovery for cook plant subsequent license renewal evaluation project; and (8) new schedules of rates, rules and regulations. On Behalf of Indiana Office of Utility Consumer Counselor. Issues: cost of service, rate design, revenue distribution, service fees.

15. Expert Report. (2023). *Alternative regulation deficiencies and potential ratepayer harms*. On Behalf of the Office of the Consumer Advocate of Iowa. October 3, 2023.

16. Expert Testimony. Docket No. 2023.06.057. (2023). Before the Public Service Commission of the State of Montana. *In the Matter of Energy West Montana's Application for Approval of Gas Cost Hedging Plan for West Yellowstone.* On Behalf of the Montana Consumer Counsel. Issues: gas hedging program.

17. Legislative Testimony. (2023). Ratepayer harms from alternative regulation in Oklahoma. Appearing on the Behalf of the Petroleum Alliance of Oklahoma. October 23, 2023.

18. Expert Testimony. Cause No. 45911. (2023). Before the State of Indiana Utility Regulatory Commission. *Petition of Indianapolis Power & Light Company D/B/A AES Indiana ("AES Indiana") for authority to increase rates and charges for electric utility service, and for approval of related relief, including (1) revised depreciation rates, (2) accounting relief, including deferrals and amortizations, (3) inclusion of capital investments, (4) rate adjustment mechanism proposals, including new economic development rider, (5) remote disconnect/reconnect process and (6) new schedules of rates, rules and regulations for service*. On Behalf of Indiana Office of Utility Consumer Counselor. Direct and Cross-Answering. Issues: allocated cost of service, revenue distribution, rate design, trackers.

19. Expert Testimony. Docket No. 23-06007. (2023). Before the Public Utilities Commission of Nevada. *In the Matter of the Application by Nevada Power Company D/B/A NV Energy, filed pursuant to NRS 704.110(3) and NRS 704.110(4), addressing its annual revenue requirement for general rates charged to all classes of electric customers.* On Behalf of the Nevada Bureau of Consumer Protection. Issues: marginal cost of service study, embedded cost of service study, revenue distribution, rate design.

20. Expert Testimony. Docket No. UE-230172. (2023). Before the Washington Utilities and Transportation Commission. *Washington Utilities and Transportation Commission, Complainant v. Pacificorp dba Pacific Power & Light Company, Respondent.* On Behalf of the Washington State Office of the Attorney General Public Counsel Unit. Issues: rate design, revenue distribution, cost of service.

21. Expert Testimony. Case No. U-21389. (2023). Before the Michigan Public Service Commission. *In the Matter of the Application of Consumers Energy Company for Authority to Increase its Rates for the Generation and Distribution of Electricity and for other Relief*. On Behalf of the Michigan Department of the Attorney General. Issues: capital expenditure adjustments, overview of proposal.

22. Expert Report. Case No. 22-1094-WW-AIR. (2023). *Audit of the Application to Increase Rates of Aqua Ohio, Inc. For the Period July 1, 2022 through June 30, 2023.* Prepared for

the Public Utilities Commission of Ohio. Issues: cost of service, billing determinants, revenue distribution, rate design.

23. Expert Report. Case No. 22-1096-ST-AIR. (2023). *Audit of the Application to Increase Rates of Aqua Ohio Wastewater, Inc. For the period July 1, 2022 through June 30, 2023.* Prepared for the Public Utilities Commission of Ohio. Issues: cost of service, billing determinants, revenue distribution, rate design.

24. Expert Report. *Analysis of the effectiveness and ratepayer impacts regarding the Natural Gas Rate Stabilization Act of 2005. (S.C. Code Ann. Section 58-5-410).* On Behalf of the South Carolina Department of Consumer Affairs. July 27, 2023.

25. Expert Testimony. Docket No. 2023-70-G. (2023). Before the Public Service Commission of South Carolina. *In the Matter of: Dominion Energy South Carolina, Inc's application for adjustments in its natural gas rate schedules and tariffs.* On Behalf of the South Carolina Department of Consumer Affairs. Issues: revenue credit, revenue distribution, rate design. Direct and Surrebuttal.

26. Expert Testimony. Docket No. E-01345A-22-0144. (2023). Before the Arizona Corporation Commission. *In the Matter of the Application of Arizona Public Service Company for a hearing to determine the fair value of the utility property of the company for ratemaking purposes, to fix a just and reasonable rate of return thereon, and to approve rate schedules designed to develop such return. On Behalf of the Utilities Division Arizona Corporation Commission.* Issues: cost of service, revenue distribution, rate design. Direct and Surrebuttal.

27. Expert Testimony. Docket No. 23-0068 (consol.) 23-0069. (2023). Before the Illinois Commerce Commission. *North Shore Gas Company, The Peoples Gas Light and Coke Company Proposed general increase in rates and revisions to service classifications, riders and terms and conditions of service.* On Behalf of the People of the State of Illinois. Issues: integrity management, infrastructure metrics, natural gas policy, state gas policy.

28. Expert Testimony. Docket No. 23-067. (2023). Before the Illinois Commerce Commission. *Ameren Illinois Company Proposed general increase in gas delivery service rates.* On Behalf of the Illinois Attorney General. Issues: integrity management, infrastructure metrics, natural gas policy, state gas policy.

29. Expert Testimony. Docket No. 23-066. (2023). Before the Illinois Commerce Commission. *Northern Illinois Gas Company d/b/a Nicor Gas Company Proposed general increase in gas rates.* On Behalf of the People of the State of Illinois. Issues: integrity management, infrastructure metrics, natural gas policy, state gas policy.

30. Expert Testimony. Docket No. U-22-081. (2023). Before the Regulatory Commission of Alaska. *In the Matter of the Revenue Requirement Study Designated as TA334-4 Filed by Enstar Natural Gas Company, A Division of SEMCO Energy, Inc.* On Behalf of the Attorney General, Regulatory Affairs & Public Advocacy Section. Issues: cost of service, rate design, revenue distribution.

31. Expert Testimony. Docket No. U-22-078. (2023). Before the Regulatory Commission of Alaska. *In the Matter of the Revenue Requirement Study and Tariff Filing Designated as TA510-1 Filed by Alaska Electric Light & Power Company.* On Behalf of the Office of the Attorney General, Regulatory Affairs & Public Advocacy Section. Issues: cost of service, rate design, seasonal rates, revenue allocation, customer charge.

C23-1837

32. Expert Testimony. Docket No. 2022.11.099. (2023). Before the Department of Public Service Regulation. *In the Matter of Montana-Dakota Utilities Co. for Authority to Establish Increased Rates for Electric Service.* On Behalf of the Montana Consumer Counsel. Direct and Cross-Answering. Issues: rate increase, cost of service study, marginal cost of service, revenue allocation, rate design.

33. Expert Testimony. Docket No. U-22-078. (2023). Before the Regulatory Commission of Alaska. *In the Matter of the Revenue Requirement Study and Tariff Filing Designated as TA510-1 Filed by Alaska Electric Light & Power Company.* On Behalf of the Office of the Attorney General, Regulatory Affairs & Public Advocacy Section. Issues: rate design, cost of service, revenue allocation, seasonal rates.

34. Expert Testimony. Docket No. U-21193. (2023). Before the Michigan Public Service Commission. *In the matter of the Application of DTE Electric Company for Approval of its Integrated Resource Plan pursuant to MCL 460.6t, and for other relief.* On Behalf of the Michigan Department of the Attorney General. Issues: Resource planning, coal retirements, asset amortization, financial compensation mechanism.

35. Expert Testimony. Docket No. RP22-1033. (2023). Before the Federal Energy Regulatory Commission. *Northern Natural Gas Company.* On Behalf of the Northern Municipal Distributors Group and the Midwest Region Gas Task Force Association. Issues: tariff provisions, rate analysis, discount adjustment.

36. Expert Testimony. Docket No. 22-061-U. (2023). Before the Arkansas Public Service Commission. *In the Matter of an Investigation into Potential Cost Shifting Associated with Net Metering.* On Behalf of the Office of Tim Griffin, Attorney General of Arkansas. Issues: policy, net metering background.

37. Expert Testimony. Docket No. 22F-0263EG. (2023). Before the Public Utility Commission of the State of Colorado. *Olson's Greenhouses of Colorado, LLC. Complainant, v. Public Service Company of Colorado Respondent*. On Behalf of Olson's Greenhouses of Colorado, LLC. Issues: reliability, system upgrades, weather normalization.

38. Expert Testimony. Docket No. 2022.07.078. (2022). Before the Public Service Commission of the State of Montana. *In the Matter of NorthWestern Energy's Application for Authority to Increase Retail Electric and Natural Gas Utility Rates and for Approval of Electric and Natural Gas Service Schedules and Rules and Allocated Cost of Service and Rate Design.* On Behalf of the Montana Consumer Counsel. Direct and Cross-Intervenor. Issues: riders, fixed cost recovery mechanism, power cost adjustment, cost of service, revenue distribution.

39. Expert Testimony. Docket No 2022-254-E. (2022). Before the Public Service Commission of South Carolina. *In the Matter of: Application of Duke Energy Progress, LLC for Authority to Adjust and Increase its Electric Rates and Charges.* On Behalf of South Carolina Department of Consumer Affairs. Direct and Surrebuttal. Issues: Cost of service, revenue allocation, rate design.

40. Expert Testimony Docket No. 22-06014. (2022). *Before the Public Utilities Commission of Nevada. In the Matter of the Application by Sierra Pacific Power Company D/B/A NV Energy, filed pursuant to NRS 704.110(3) and NRS 704.110(4), addressing its annual revenue requirement for general rates charged to all classes of electric customers*. On Behalf of the Nevada Bureau of Consumer Protection. Issues: rate design, cost of services, marginal cost of service, revenue distribution.

41. Expert Testimony Docket No. 2022.06.067. (2022). *Before the Public Service Commission of the State of Montana. In RE NorthWestern Energy's Application for an Advanced Metering Opt-Out Tariff.* On Behalf of the Montana Consumer Counsel. Direct and Rebuttal. Issues: meter issues, opt-out fees, tariffs options.

42. Expert Testimony Docket No. 16-036-FR. (2022). *Before the Arkansas Public Service Commission. In the Matter of the Formula Rate Plan Filings of Entergy Arkansas, INC., Pursuant to APSC Docket NO. 15-015-U. On Behalf of the Arkansas Attorney General Leslie Rutledge.* Issues: Rate design, netting adjustment, performance standards, projected year adjustments.

43. Expert Testimony Formal Case No. 1169. (2022). *Before the Public Service Commission of the District of Columbia. In the Matter of the application of Washington Gas Light Company for authority to increase existing rates and charges for gas service.* On Behalf of the People's Counsel for the District of Columbia. Direct and Rebuttal. Issues: Revenue allocation, weather normalization, rate design.

44. Expert Testimony Case No. U-21224. (2022). *Before the Michigan Public Service Commission. In the Matter of the Application of Consumers Energy Company for authority to increase its rates for the generation and distribution of electricity and for other relief*. On Behalf of the Michigan Department of the Attorney General. Issues: cost of service, revenue distribution, policy overview.

45. Expert Report. Case No. 695287. (2022). Before the Nineteenth Judicial District Court, The Parish of East Baton Rouge, State of Louisiana. *Washington-St. Tammany Electric Cooperative, Inc. and Claiborne Electric Cooperative, Inc., Plaintiff v. Louisiana Generating, L.L.C., Defendant.* On Behalf of Louisiana Generating, L.L.C. Issues: environmental regulations, re-fueling, regulatory rules, collateral benefits.

46. Expert Report. Case No. 0:20-cv-60981-AMC. (2022). *Café, Gelato & Panini LLC, d/b/a Café Gelato Panini, on behalf of itself and all others similarly situated, Plaintiff v. Simon Property Group, Inc., Simon Property Group, L.P., M. S. Management Associates, Inc. And The Town Center at Boca Raton Trust, Defendant.* On Behalf of Simon Property Group, Inc.

47. Expert Testimony Case No. U-20836. (2022). *Before the Michigan Public Service Commission. In the Matter of the Application of DTE Electric Company for authority to increase its rates, amend its rate schedules and rules governing the distribution and supply of electric energy, and for miscellaneous accounting authority.* On Behalf of the Michigan Department of the Attorney General. Issues: cost of service, revenue distribution, peer comparison.

48. Expert Testimony. D.P.U. 22-22. (2022*). Before the Department of Public Utilities of the Commonwealth of Massachusetts. Petition of NSTAR Electric Company d/b/a Eversource Energy for Approval of a Performance-Based Ratemaking Plan and Increase in Base Distribution Rates for Electric Service Pursuant to G.L. c. 164, §94 and 220 C.M.R. §5.00.* On Behalf of Massachusetts Office of the Attorney General Office of Ratepayer Advocacy. Issues: rate design, TFP analysis, rate increases, benchmark analysis, revenue distribution. Direct and Surrebuttal.

49. Expert Testimony. Docket No. 21-097-U. (2022). In the Matter of the Application of Black Hills Energy Arkansas, Inc. for Approval of a General Change in Rates and Tariffs. On Behalf of the Office of Arkansas Attorney General. Issues: cost of service, rate design,

reliability, billing determinant adjustment.

50. Expert Testimony. Docket No. 2021-361-G. (2022). Before the Public Service Commission of South Carolina. *In the Matter of: Dominion Energy South Carolina, Inc.'s Request for Approval of New Natural Gas Energy Efficiency Programs*. On Behalf of South Carolina Department of Consumer Affairs. Issues: DSM Rider, energy efficiency, shared savings. Direct and Surrebuttal.

51. Expert Report. Case No. 21-596-ST-AIR. (2022). *Audit of the Application to Increase Rates of Aqua Ohio Wastewater, Inc. For the Period January 1, 2021 through December 31, 2021*. Prepared for Public Utilities Commission of Ohio. Issues: rate design, cost of service, revenue distribution.

52. Expert Report. Case No. 21-595-WW-AIR. (2022). *Audit of the Application to Increase Rates of Aqua Ohio, Inc. For the Period January 1, 2021 through December 31, 2021.* Prepared for Public Utilities Commission of Ohio. Issues: rate design, cost of service, revenue distribution.

53. Expert Testimony. Docket No. 2021.09.112. (2022). *Before the Public Service Commission of the State of Montana. In the Matter of NorthWestern Energy's Annual PCCAM Filing and Application for Approval of Tariff Changes.* On Behalf of the Montana Consumer Counsel. Issues: wholesale energy hedging, market exposure, overview of PCCAM filing, demand side management costs.

54. Expert Affidavit. Docket No. 2:21-cv-1074. (2021). In the United States District Court for the Western District of Louisiana. *The State of Louisiana by and through its Attorney General, Jeff Landry et al. Plantiffs, v. Joseph R. Biden, Jr., in his official capacity as President of the United States; et al., Defendants.* On Behalf of the Attorney General of Louisiana. Issues: social cost of carbon, carbon tax, environmental policy.

55. Expert Testimony. Case No. U21090. (2021). *Before the Michigan Public Service Commission. In the matter of the application of Consumers Energy Company for approval of its Integrated Resource Plan pursuant to MCL 460.6t, certain accounting approvals, and for other relief*. On Behalf of the Michigan Department of the Attorney General. Issues: IRP, coal plant retirements, acquisition premiums, financial compensation mechanism.

56. Expert Testimony. Docket No 16-036-FR. (2021). Before the Arkansas Public Service Commission. *In the Matter of the Formula Rate Plan Filings of Entergy Arkansas, Inc., Pursuant to APSC Docket No. 15-015-U*. On Behalf of the Office of Arkansas Attorney General Leslie Rutledge. Issues: netting adjustments, rate increases, projected year adjustments, reliability.

57. Expert Report. Docket JCCP No. 4861. (2021). Before the Superior Court of the State of California County of Los Angeles, Central Civil West. *Coordination Proceeding Special Title [Rule 3.550] Southern California Gas Leak Cases.* On Behalf of Toll Brothers. Issues: gas leak, public service obligation, integrity management.

58. Expert Testimony. Docket No. U-35927. (2021). Before the Louisiana Public Service Commission. *In Re: Application of 1803 Electric Cooperative, Inc. for Approval of Power Purchase Agreements and for Cost Recovery.* Direct and Cross-Answering. On Behalf of Cleco Cajun LLC. Issues: tolling agreements, generation acquisition, risk factors.

59. Expert Testimony. Docket No. 21-060-U. (2021). Before the Arkansas Public Service Commission. *In the Matter of Joint Application of Centerpoint Energy Resources Corp.*

and Summit Utilities Arkansas, Inc. For all Necessary Authorizations and Approvals for Summit Utilities Arkansas, Inc. To Acquire the Arkansas Assets of Centerpoint Energy Resources Corp. and for Approval of a Certificate of Public Convenience and necessity for Summit Utilities Arkansas, Inc. Direct and Surrebuttal. On Behalf of the Office of Arkansas Attorney General Leslie Rutledge. Issues: asset acquisition, ratepayer benefits, acquisition synergies, Rider FRP.

60. Expert Affidavit. Civil Action No. 2:21-cv-00778 (2021). Before the United States District Court for the Western District of Louisiana. *The State of Louisiana v. Joseph R. Biden, Jr.* Issues: leasing and drilling moratorium, state revenue, coastal restoration, economic activity.

61. Expert Testimony. Docket No. 21-044-U (2021). Before the Arkansas Public Service Commission. *In the Matter of Centerpoint Energy Resources Corp. D/B/A Centerpoint Energy Arkansas Gas' Request to Extend Rider FRP.* On Behalf of the Office of Arkansas Attorney General Leslie Rutledge. Issues: ratepayer benefits, service quality, cost of service, FRP extension.

62. Expert Testimony. Docket No. 17-010-FR (2021). Before the Arkansas Public Service Commission. *In the Matter of the Formula Rate Plan Filings of Centerpoint Energy Resources Corp. D/B/A Centerpoint Energy Arkansas Gas Pursuant to APSC Docket No. 15-098-U.* On Behalf of the Office of Arkansas Attorney General Leslie Rutledge. Issues: rate increase, investment and expense trends, revenue deficiency, leak performance.

63. Expert Testimony. Case No. U-20963 (2021). Before the Michigan Public Service Commission. *In the Matter of the Application of Consumers Energy Company for authority to increase its rates for the generation and distribution of electricity and for other relief.* On Behalf of the Michigan Department of the Attorney General. Issues: cost of service, peak allocation, revenue distribution.

64. Expert Testimony. U-20-072, U-20-073, U-20-074. (2021). Before the Regulatory Commission of Alaska. *In the Matter of the Revenue Requirement study and Tariff Filing designated as TA886-2 filed by Alaska Power Company, In the Matter of the Revenue Requirement study and Tariff filing designated as TA6-521 filed by Goat Lake Hydro, Inc., In the Matter of the Revenue Requirement study and Tariff filing designated as TA4-573 filed by BBL Hydro, Inc.* On Behalf of the Alaska Office of Attorney General. Issues: rate groups, cost of service.

65. Expert Testimony. Docket No. P20-001. (2021). Before the Louisiana Pilotage Fee Commission. *In Re: Request for Increase in Approved Pilot Complement; Increased Funding for necessary Additional Manpower; Upward Adjustment of Estimated Average Annual Pilot Compensation; and Related Relief Pursuant to LA R.S. 34:112.* On Behalf of the Louisiana Chemical Association (LCA) and Louisiana Mid-Continent Oil & Gas Association (LMOGA). Issues: unreasonable requests, fee structure, economic impact, over earnings.

66. Expert Testimony. D.P.U. 20-120. (2021). Before the Commonwealth of Massachusetts Before the Department of Public Utilities. *Petition of Boston Gas Company d/b/a National Grid Pursuant to G.L. c. 164, 94 and 220 C.M.R. 5.00 for Approval of an Increase in Base Distribution Rates and Approval of a Performance-Based Ratemaking Plan.* On Behalf of the Massachusetts Office of the Attorney General Office of Ratepayer Advocacy. Issues: rate increase, accelerated depreciation, benchmarking analysis, performance incentive

mechanism.

67. Expert Testimony. RPU-2020-0001. (2020). Before the Iowa Utilities Board. *In Re: Iowa-American Water Company.* On Behalf of the Office of Consumer Advocate. Issues: rate increase, test trackers, RSM accounting ratemaking construct.

68. Expert Testimony. BPU Docket Nos. QO19010040 and GO20090622. (2020). Before the New Jersey Board of Public Utilities. *In the Matter of the Petition of New Jersey Natural Gas Company for Approval of Energy Efficiency Programs and the Associated Cost Recovery Mechanisms Pursuant to the Clean Energy Act, N.J.S.A. 48:3-87.8 et seq. and 48:3-98.1 et seq.* On behalf of the Division of Rate Counsel. Issues: CBA requirements, capacity benefits, volatility benefits.

69. Expert Testimony. Docket No. 2020-125-E. (2020). Before the Public Service Commission of South Carolina. *In the Matter of: Application of Dominion Energy South Carolina, Incorporated for Adjustments of Rates and Charges (See Commission Order No. 2020-313).* On Behalf of the South Carolina department of Consumer Affairs. Issues: cost of service, revenue allocation, rate design.

70. Answering Testimony. Before the United States of America Federal Energy Regulatory Commission. Docket No. RP20-614-000 and RP20-618-000. (2020). *Transcontinental Gas Pile Line Company, LLC.* On Behalf of the North Carolina Utilities Commission. Issues: Tariff revisions, assessment of Transco claims.

71. Expert Testimony. Docket No. 16-036-FR. (2020). *Before the Arkansas Public Service Commission. In the Matter of the Formula Rate Plan Filings of Entergy Arkansas, Inc., Pursuant to APSC Docket No. 15-015-U. Direct and Surrebuttal*. On Behalf of the Arkansas Attorney General Leslie Rutledge. Issues: rate increases, investment and expenses trends, load forecast, historic year netting adjustment, reliability issues.

72. Expert Testimony. Docket No. 2019.12.101. (2020). Before the Public Service Commission of the State of Montana. *In the Matter of NorthWestern Energy's Application for Approval of Capacity Resource Acquisition.* On the Behalf of the Montana Consumer Counsel. Issues: sale of capital asset, evaluation benefits, ratepayer cost exposure, reserve fund.

73. Expert Testimony. Formal Case No. 1162. (2020). Before the Public Service Commission of the District of Columbia. *In the Matter of the Application of Washington Gas Light Company for Authority to Increase Existing Rates and Charges for Gas Service*. On Behalf of the Office of the People's Counsel. Issues: rate increase, revenue adjustment, weather normalization, rate design, revenue distribution.

74. Expert Testimony. Docket No. E-01345A-19-0236. (2020). Before the Arizona Corporation Commission. *In the Matter of the Application of Arizona Public Service Company for Ratemaking Purposes to Fix a Just and Reasonable Rate of Return Thereon, to Approve Rate Schedules Designed to Develop such Return*. Direct and Surrebuttal. On Behalf of the Utilities Division of the Arizona Corporation Commission. Issues: Cost of Service, Revenue Distribution, Rate Design.

75. Expert Testimony. Docket No. 17-010-FR. (2020). Before the Arkansas Public Service Commission. *In the Matter of the Formula Rate Plan Filings of Centerpoint Energy Resources Corp. D/B/A Centerpoint Energy Arkansas Gas Pursuant to APSC Docket No. 15-098-U.* On Behalf of the Arkansas Attorney General Leslie Rutledge. Issues: rate

increase, leak replacement and reduction, netting adjustment, revenue deficiency, accounting policy changes.

76. Expert Testimony. Case No. U-20697. (2020). Before the Michigan Public Service Commission. *In the Matter of the Application of Consumers Energy Company for authority to increase its rates for the generation and distribution of electricity and for other relief*. On Behalf of the Michigan Department of Attorney General. Issues: cost of service, revenue distribution, rate design.

77. Expert Testimony. Docket No. 2019.09.058. (2020). Before the Public Service Commission of the State of Montana. *In the Matter of NorthWestern Energy's Annual PCCAM Filing and Application for Approval of Tariff Changes*. On the Behalf of the Montana Consumer Counsel. Issues: purchase power expenses, cost sharing, PCAAM power cost.

78. Expert Testimony. Formal Case No. 1156. (2020). Before the Public Service Commission of the District of Columbia. *In the matter of Potomac Electric Power Company for authority to implement a multiyear rate plan for electric distribution service in the district of Columbia.* Direct, Rebuttal, Surrebuttal, Supplemental, and Second Supplemental. On Behalf of the Office of the People's Counsel. Issues: revenue distribution, rate design, customer charge, performance metric policies, performance metric incentives.

79. Expert Testimony. Case No. U-20561. (2019). Before the Michigan Public Service Commission. *In the matter of the Application of DTE Electric Company for authority to increase its rates, amend its rate schedules and rules governing the distribution and supply of electric energy, and for miscellaneous accounting authority*. On Behalf of the Michigan Department of Attorney General. Issues: Cost of service, allocation of production plant, allocation of sub-transmission plant, revenue distribution.

80. Expert Testimony. Cause No. 45253. (2019). Before the Indiana Utility Regulatory Commission. *Petition of Duke Energy Indiana, LLC Pursuant to Ind. Code 8-1-2-42.7 and 8-1-2-61, for (1) Authority to Modify its Rates and Charges for Electric Utility Service through a Step-In of New Rates and Charges using a Forecasted Test Period; (2) Approval of New Schedules of Rates and Charges, General Rules and Regulations, and Riders; (3) Approval of a Federal Mandate Certificate Under Ind. Code 8-1-8.4-1; (4) Approval of Revised Electric Depreciation Rates Applicable to its Electric Plant in Service; (5) Approval of Necessary and Appropriate Accounting Deferral Relief; and (6) Approval of a Revenue Decoupling Mechanism for Certain Customers Classes*. On Behalf of the Indiana Office of Utility Consumer Counsel. Issues: Decoupling, revenue decoupling mechanism and design, commission policy, benchmarking analysis.

81. Expert Testimony. Docket 19-019-U. (2019). Before the Arkansas Public Service Commission. *In the Matter of the Petition of Entergy Arkansas, LLC for Approval of a Build-Own-Transfer Arrangement for a Renewable Resource and for all other Related Approvals.* On Behalf of the Arkansas Attorney General Leslie Rutledge. Issues*:* Solar investment, risk assessment, proposed rider.

82. Expert Testimony. Docket No. 16-036-FR. (2019). Before the Arkansas Public Service Commission. *In the Matter of the Formula Rate Plan Filings of Entergy Arkansas, Inc., Pursuant to APSC Docket No. 15-015-U.* On Behalf of the Arkansas Attorney General Leslie Rutledge. Issues: rate design, reliability, and formula rate plan.

83. Expert Testimony. Docket No. 19-019-U. (2019). Before the Arkansas Public Service Commission. *In the Matter of the Petition of Entergy Arkansas, LLC for Approval of a Build-Own-Transfer Arrangement for a Renewable Resource and for all other Related Approvals*. On Behalf of the Arkansas Attorney General Leslie Rutledge. Issues: Solar project approval, ratepayer risk, cost allocation.

84. Expert Testimony. Docket No. 17-010-FR. (2019). Before the Arkansas Public Service Commission. *In the Matter of the Formula Rate Plan Filings of Centerpoint Energy Resources Corp. D/B/A Centerpoint Energy Arkansas Gas Pursuant to APSC Docket No. 15-098-U.* On Behalf of the Arkansas Attorney General Leslie Rutledge. Issues: retail rates, leak analysis, revenue deficiency, investments.

85. Expert Testimony. Case No. U-20471. (2019). Before the Michigan Public Service Commission. *In the matter of the Application of DTE Electric Company for approval of its Integrated Resource Plan pursuant to MCL 460.6t, and for other relief.* On Behalf of the Michigan Department of Attorney General. Issues: load forecasting, least-cost system planning.

86. Expert Report. Docket No. 18-004422. (2019). Before the State of Florida Division of Administrative Hearings. *Peoples Gas System vs. South Sumter Gas Company, LLC and the City of Leesburg.* On Behalf of the City of Leesburg. Issues: retail rates, customer growth, sales trends and forecasts, policy, cost of service, socio-economic trends and forecasts.

87. Expert Testimony. Docket Nos. GO18101112 and EO18101113. (2019). Before the New Jersey Board of Public Utilities. *In the Matter of the Public Service Electric and Gas Company for Approval of its Clean Energy Future-Energy Efficiency ("CEF-EE") Program on a Regulated Basis.* On behalf of the Division of Rate Counsel. Issues: economic impact, cost benefit analysis, decoupling mechanisms.

88. Expert Testimony. Docket Nos. EO18060629 and GO18060630. (2019). Before the New Jersey Board of Public Utilities. *In the Matter of the Public Service Electric and Gas Company for Approval of the Second Energy Strong Program (Energy Strong II)*. On behalf of the Division of Rate Counsel. Issues: economic impact, cost benefit analysis, infrastructure replacement, cost recovery tracker mechanisms.

89. Expert Report. Docket No. 2011-AD-2. (2019). On Behalf of the Mississippi Public Service Commission. *Order Establishing Docket to Investigate the Development and Implementation of Net Metering Programs and Standards.* On Behalf of the Mississippi Public Utilities Staff. Issues: Net-metering, distributed generation.

90. Expert Testimony. Docket No. D2018.2.12. (2018). Before the Public Service Commission of the State of Montana. *In the Matter of NorthWestern Energy's Application for Authority to Increase Retail Electric Utility Service Rates and for Approval of Electric Service Schedules and Rules and Allocated Cost of Service and Rate Design.* On Behalf of the Montana Consumer Counsel. Issues: Net-metering, cost of service, revenue distribution, rate design.

91. Expert Testimony. Docket No. 19-SEPE-054-MER. (2018). Before the Kansas Corporation Commission. *In the Matter of the Joint Application of Sunflower Electric Power Corporation and Mid-Kansas Electric Company, Inc. for an Order Approving the Merger of Mid-Kansas Electric Company, Inc. into Sunflower Electric Power Corporation*. On the Behalf of the Kansas Electric Power Cooperative, Inc. Issues: merger impacts, rates,

C23-1844

tariffs.

92. Expert Testimony. Docket No. 18-046-FR. (2018). Before the Arkansas Public Service Commission. *In the Matter of the Formula Rate Plan Filings of Oklahoma Gas and Electric Company Pursuant to APSC Docket No. 16-052-U.* On Behalf of the Arkansas Attorney General Leslie Rutledge. Issues: formula rate plan, plant investment and expenses benchmarking analysis, reliability.

93. Expert Testimony. Docket No. 16-036-FR. (2018). Before the Arkansas Public Service Commission. *In the Matter of the Formula Rate Plan Filings of Entergy Arkansas, Inc., Pursuant to APSC Docket No. 15-015-U.* On Behalf of the Arkansas Attorney General Leslie Rutledge. Issues: rate design, reliability, and formula rate plan.

94. Expert Testimony. Docket No. 2017-AD-0112. (2018). Before the Mississippi Public Service Commission. *In Re: Encouraging Stipulation of Matters in Connection with the Kemper County IGCC Project.* On Behalf of the Mississippi Public Utilities Staff. Issues: cost of service and rate design.

95. Expert Affidavit. Docket No. 87011-E. (2018). Before the 16th Judicial District Court Parish of St. Martin State of Louisiana. *Bayou Bridge Pipeline, LLC versus 38.00 Acres, More or Less, Located in St. Martin Parish; Barry Scott Carline, et al.* Issues: economic impacts.

96. Expert Testimony. Docket No. QO18080843. (2018). Before the New Jersey Board of Public Utilities. *In the Matter of the Petition of Nautilus Offshore Wind, LLC for the Approval of the State Waters Wind Project and Authorizing Offshore Wind Renewable Energy Certificates.* On behalf of the Division of Rate Counsel. Issues: regulatory policy and cost-benefit analyses.

97. Expert Testimony. Docket No. ER18010029 and GR18010030. (2018). Before the New Jersey Board of Public Utilities. *In the Matter of the Petition of Public Service Electric and Gas Company for Approval of an Increase in Electric and Gas Rates and for Changes in the Tariffs for Electric and Gas Service, B.P.U.N.J. No. 16 Electric and B.P.U.N.J No. 16 Gas, and for Changes in Depreciation Rates, Pursuant to N.J.S.A. 48:2-18, N.J.S.A. 48:2-21 and N.J.S.A. 48:2-21.1, and for Other Appropriate Relief.* On behalf of the Division of Rate Counsel. Issues: rate proposal, revenue decoupling, regulatory policy, cost benchmarking.

98. Expert Testimony. Docket No. T-34695. (2018). Before the Louisiana Public Service Commission. *In re: Application for a rate increase on service originating at Grand isle and termination at St. James for Crude Petroleum as currently outlined in LPSC Tariff No. 75.2*. On Behalf of Energy XXI GOM, LLC. Issues: cost of service, rate design, and alternative regulation.

99. Expert Testimony. Docket No. 17-071-U. (2018). Before the Arkansas Public Service Commission*. In the Matter of the Application of Black Hills Energy Arkansas, Inc. for Approval of a General Change in Rates and Tariffs*. On Behalf of the Arkansas Attorney General Leslie Rutledge. Issues: cost of service, rate design, billing determinates.

100. Expert Testimony. Docket No. 17-010-FR. (2018). Before the Arkansas Public Service Commission. *In the Matter of the Formula Rate Plan Filing of CenterPoint Energy Resources Corp. D/B/A CenterPoint Energy Arkansas Gas Pursuant to APSC Docket No. 15-098-U.* On Behalf of the Arkansas Attorney General Leslie Rutledge. Issues: cost of service, rate design, alternative regulation, formula rate plan.

101. Expert Testimony. Case No. PU-17-398. (2018). Before the North Dakota Public Service Commission. *In the Matter of the Application of Otter Tail Power Company for Authority to Increase Rates for Electric Utility Service in North Dakota*. On Behalf of the North Dakota Service Commission Advocacy Staff. Issues: cost of service, marginal cost of service, and rate design.

102. Expert Testimony. Docket No. 20170179-GU. (2018). Before the Florida Public Service Commission. *In re: Petition for rate increase and approval of depreciation study by Florida City Gas.* On Behalf of the Citizens of the State of Florida. Issues: policy issues concerning long-term gas capacity procurement.

103. Expert Testimony. Docket No. 18-KCPE-095-MER. (2018). Before the Kansas Corporation Commission. *In the Matter of the Joint Application of Great Plains Energy Incorporated, Kansas City Power & Light Company, and Westar Energy, Inc. for Approval of the Merger of Westar, Inc. and Great Plains Energy Incorporated.* On the Behalf of the Kansas Electric Power Cooperative, Inc. Issues: merger/acquisition policy, financial risk, and ring-fencing.

104. Expert Testimony. Docket No. GR17070776. (2018). Before the New Jersey Board of Public Utilities. In the Matter of the Petition of Public Service Electric and Gas Company for Approval of the Next Phase of the Gas System Modernization Program and Associated Cost Recovery Mechanism ("GSMP II"). On behalf of the Division of Rate Counsel. Issues: economic impact, infrastructure replacement program rider, pipeline replacement, leak rate comparisons and cost benefit analysis.

105. Expert Affidavit. Case No. 18-489. (2018). Before the Civil District Court for the Parish of Orleans, State of Louisiana. *Bayou Bridge Pipeline, LLC versus The White Castle Lumber and Shingle Company Limited and Jeanerette Lumber & Shingle CO. L.L.C.* Issues: economic impact of crude oil pipeline development.

106. Expert Testimony. Docket No. 16-036-FR. (2017). Before the Arkansas Public Service Commission. *In the Matter of the Formula Rate Plan Filings of Entergy Arkansas, Inc., Pursuant to APSC Docket No. 15-015-U*. On behalf of the Office of the Arkansas Attorney General Leslie Rutledge. Issue: cost of service, rate design, alternative regulation, formula rate plan.

107. Expert Testimony. Docket No. 2017-AD-0112. (2017). Before the Mississippi Public Service Commission. *In re: Encouraging Stipulation of Matters in Connection with the Kemper County IGCC Project*. On Behalf of the Mississippi Public Utilities Staff. Issues: financial analysis, rates and cost trends, economic impacts of proposal.

108. Expert Testimony. Case No. 2017-00179. (2017). Before the Public Service Commission, Commonwealth of Kentucky. *Electronic Application of Kentucky power Company For (1) A General Adjustment of Its Rates for Electric Service; (2) An Order Approving Its 2017 Environmental Compliance Plan; (3) An Order Approving Its Tariffs and Riders; (4) An Order Approving Accounting Practices to Establish a Regulatory Asset or Liability Related to the Big Sandy 1 Operation Rider; and (5) An Order Granting All Other Required Approvals and Relief.* On Behalf of the Office of the Kentucky Attorney General. Issues: rate design, revenue allocation, economic development.

109. Expert Testimony. Docket No. 17-010-FR. (2017). Before the Arkansas Public Service Commission. *In the Matter of the Formula Rate Plan Filing of CenterPoint Energy Resources Corp. D/B/A CenterPoint Energy Arkansas Gas Pursuant to APSC Docket No.*

15-098-U. On Behalf of the Arkansas Attorney General Leslie Rutledge. Issues: cost of service, rate design, alternative regulation, formula rate plan.

110. Expert Testimony. Formal Case No. 1142. (2017). Before the Public Service Commission of the District of Columbia. *In the Matter of the Merger of AltaGas Ltd. and WGL Holdings, Inc.* On Behalf of the Office of the People's Counsel. Issues: merger/acquisition policy, financial risk, ring-fencing, and reliability.

111. Expert Testimony. D.P.U. 17-05. (2017). Before the Massachusetts Department of Public Utilities. *Petition of NSTAR Electric Company and Western Massachusetts Electric Company each d/b/a Eversource Energy for Approval of an Increase in Base Distribution Rates for Electric Service Pursuant to G.L. c. 164, § 94 and 220 C.M.R. § 5.00*. On Behalf of the Massachusetts Office of the Attorney General Office of Ratepayer Advocacy. Issues: performance-based ratemaking, multi-factor productivity estimation.

112. Deposition and Testimony. (2017) Before the Nebraska Section 70, Article 13 Arbitration Panel. *Northeast Nebraska Public Power District, City of South Sioux City Nebraska; City of Wayne, Nebraska; City of Valentine, Nebraska; City of Beatrice, Nebraska; City of Scribner, Nebraska; Village of Walthill, Nebraska, vs. Nebraska Public Power District.* On the Behalf of Baird Holm LLP for the Plaintiffs. Issues: rate discounts; cost of service; utility regulation, economic harm.

113. Expert Testimony. Docket No. 16-052-U. (2017). Before the Arkansas Public Service Commission. *In the Matter of the Application of the Oklahoma Gas and Electric Company for Approval of a General Change in Rates, Charges and Tariffs.* On the Behalf of the Office of Arkansas Attorney General Leslie Rutledge. Issues: cost of service, rate design, alternative regulation, formula rate plan.

114. Expert Testimony. Docket No. 16-KCPE-593-ACQ. (2016). Before the Kansas Corporation Commission. *In the Matter of the Joint Application of Great Plains Energy Incorporated, Kansas City Power & Light Company, and Westar Energy, Inc. for Approval of the Acquisition of Westar, Inc. by Great Plains Energy Incorporated.* On the Behalf of the Kansas Electric Power Cooperative, Inc. Issues: merger/acquisition policy, financial risk, and ring-fencing.

115. Expert Testimony. Formal Case No. 1139. (2016). Before the Public Service Commission of the District of Columbia. *In the Matter of the Application of Potomac Electric Power Company for Authority to Increase Existing Retail Rates and Charges for Electric Distribution Service.* On the Behalf of the Office of the People's Counsel for the District of Columbia. Issues: cost of service, rate design, alternative regulation.

116. Expert Affidavit. Docket No. CP15-558-000 (2016). Before the United States of America Federal Energy Regulatory Commission. *PennEast Pipeline Company, LLC*. Affidavit and Reply Affidavit. On the Behalf of the New Jersey Division of Rate Counsel. Issues: pipeline capacity, peak day requirements.

117. Expert Testimony. Docket No. RPU-2016-0002. (2016). Before the Iowa Utilities Board. *In re: Iowa American Water Company application for revision of rates.* On behalf of the Office of Consumer Advocate. Issue: revenue stabilization mechanism, revenue decoupling.

118. Expert Testimony. Docket No. 15-015-U. (2016). Before the Arkansas Public Service Commission. *In the Matter of the Formula Rate Plan Filings of Entergy Arkansas, Inc.,*

Pursuant to APSC Docket No. 15-015-U. On behalf of the Office of the Arkansas Attorney General Leslie Rutledge. Issue: formula rate plan evaluation.

119. Expert Testimony. Docket Nos. 160021-EI, 160061-EI, 160062-EI, and 160088-EI. (2016). Before the Florida Public Service Commission. *In re: Petition for rate increase by Florida Power & Light Company (consolidated).* On behalf of the Citizens of the State of Florida. Issue: load forecasting.

120. Expert Testimony. Docket Nos. 160021-EI, 160061-EI, 160062-EI, and 160088-EI. (2016). Before the Florida Public Service Commission. *In re: Petition for rate increase by Florida Power & Light Company (consolidated).* On behalf of the Citizens of the State of Florida. Issue: off-system sales incentives.

121. Expert Testimony. Project No. 5-103. (2016). United States of America Federal Energy Regulatory Commission. *Confederated Salish and Kootenai Tribes Energy Keepers, Incorporated*. On behalf of the Flathead, Mission, and Jocko Valley Irrigation Districts and the Flathead Joint Board of Control of the Flathead, Mission, and Jocko Valley Irrigation Districts.

122. Expert Testimony. Docket No. 15-098-U. (2016). Before the Arkansas Public Service Commission. *In the Matter of the Application of CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Arkansas Gas for a General Change or Modification in its Rates, Charges and Tariffs.* On behalf of the Office of the Arkansas Attorney General. Issues: formula rate plan, cost of service and rate design.

123. Expert Testimony. BPU Docket No. GM15101196. (2016). *In the Matter of the Merger of Southern Company and AGL Resources, Inc*. On behalf of the New Jersey Division of Rate Counsel. Issues: merger standards of review, customer dividend contributions, synergy savings and costs to achieve, ratemaking treatment of merger-related costs.

124. Expert Testimony. Docket No. 15-078-U. (2015). Before the Arkansas Public Service Commission. *In the Matter of the Joint Application of SourceGas Inc., SourceGas LLC, SourceGas Holdings LLC and Black Hills Utility Holdings, Inc. for all Necessary Authorizations and Approvals for Black Hills Utility Holdings, Inc. to Acquire SourceGas Holdings LLC.* On behalf of the Office of the Arkansas Attorney General. Issues: public policy and regulatory policy associated with the acquisition.

125. Expert Testimony. Docket No. 15-031-U. (2015). Before the Arkansas Public Service Commission. *In the Matter of the Application of SourceGas Arkansas Inc. for an Order Approving the Acquisition of Certain Storage Facilities and the Recovery of Investments and Expenses Associated Therewith.* On behalf of the Office of the Arkansas Attorney General. Issues: cost-benefit analysis, transmission cost analysis, and a due diligence analysis.

126. Expert Testimony. Docket No. 15-015-U. (2015). Before the Arkansas Public Service Commission. *In the Matter of the Application of Entergy Arkansas, Inc. for Approval of Changes in Rates for Retail Electric Service.* On behalf of the Office of the Arkansas Attorney General. Issues: economic development riders and production plant cost allocation.

127. Expert Testimony. Docket No. 7970. (2015). Before the Vermont Public Service Board. *Petition of Vermont Gas Systems, Inc., for a certificate of public good pursuant to 30 V.S.A.§ 248, authorizing the construction of the "Addison Natural Gas Project" consisting*

of approximately 43 miles of new natural gas transmission pipeline in Chittenden and Addison Counties, approximately 5 miles of new distribution mainlines in Addison County, together with three new gate stations in Williston, New Haven, and Middlebury, Vermont. On behalf of AARP-Vermont. Issues: net economic benefits of proposed natural gas transmission project.

128. Expert Testimony. File No. ER-2014-0370 (2015). Before the Public Service Commission of the State of Missouri. *In the Matter of Kansas City Power & Light Company for Authority Implement A General Rate Increase for Electric Service*. On behalf of the Missouri Office of the People's Counsel. Issues: customer charges, rate design, revenue distribution, class cost of service, and policy and ratemaking considerations in connection with electric vehicle charging stations.

129. Expert Testimony. File No. ER-2014-0351 (2015). Before the Public Service Commission of the State of Missouri. *In the Matter of The Empire District Electric Company for Authority To File Tariffs Increasing Rates for Electric Service Provided to Customers In the Company's Missouri Service Area*. On behalf of the Missouri Office of the People's Counsel. Issues: customer charges, rate design, revenue distribution, and class cost of service.

130. Expert Testimony. D.P.U. 14-130 (2015). Before the Massachusetts Department of Public Utilities. *Petition of Fitchburg Gas and Electric Light Company d/b/a Unitil for approval by the Department of Public Utilities of the Company's 2015 Gas System Enhancement Program Plan, pursuant to G.L. c. 164, § 145, and for rates effective May 1, 2015.* On behalf of the Attorney General's Office. Issues: ratepayer protections, cost allocations, rate design, performance metrics.

131. Expert Testimony. D.P.U. 14-131 (2015). Before the Massachusetts Department of Public Utilities. *Petition of The Berkshire Gas Company for approval by the Department of Public Utilities of the Company's Gas System Enhancement Program Plan for 2015, pursuant to G.L. c. 164, § 145, and for rates effective May 1, 2015*. On behalf of the Attorney General's Office. Issues: ratepayer protections, cost allocations, rate design, performance metrics.

132. Expert Testimony. D.P.U. 14-132 (2015). Before the Massachusetts Department of Public Utilities. *Petition of Boston Gas Company and Colonial Gas Company d/b/a National Grid for approval by the Department of Public Utilities of the Companies' Gas System Enhancement Program for 2015, pursuant to G.L. c. 164, § 145, and for rates effective May 1, 2015*. On behalf of the Attorney General's Office. Issues: ratepayer protections, cost allocations, rate design, performance metrics.

133. Expert Testimony. D.P.U. 14-133 (2015). Before the Massachusetts Department of Public Utilities. *Petition of Liberty Utilities for approval by the Department of Public Utilities of the Company's Gas System Enhancement Program Plan for 2015, pursuant to G.L. c. 164, § 145, and for rates effective May 1, 2015*. On behalf of the Attorney General's Office. Issues: ratepayer protections, cost allocations, rate design, performance metrics.

134. Expert Testimony. D.P.U. 14-134 (2015). Before the Massachusetts Department of Public Utilities. *Petition of Bay State Gas Company d/b/a Columbia Gas of Massachusetts for approval by the Department of Public Utilities of the Company's Gas System Enhancement Program Plan for 2015, pursuant to G.L. c. 164, § 145, and for rates to be effective May 1, 2015*. On behalf of the Attorney General's Office. Issues: ratepayer protections, cost allocations, rate design, performance metrics.

135. Expert Testimony. D.P.U. 14-135 (2015). Before the Massachusetts Department of Public Utilities. *Petition of NSTAR Gas Company for approval by the Department of Public Utilities of the Company's Gas System Enhancement Program Plan for 2015, pursuant to G.L. c. 164, § 145, and for rates to be effective May 1, 2015*. On behalf of the Attorney General's Office. Issues: ratepayer protections, cost allocations, rate design, performance metrics.

136. Expert Report. Docket No. X-33192 (2015). Before the Louisiana Public Service Commission. *Examination of the Comprehensive Costs and Benefits of Net Metering in Louisiana.* On behalf of the Louisiana Public Service Commission. Issues: cost-benefit, cost of service, rate impact.

137. Expert Testimony. F.C. 1119 (2014). Before the District of Columbia Public Service Commission. *In the Matter of the Merger of Exelon Corporation, Pepco Holdings, Inc., Potomac Electric Power Company, Exelon Energy Delivery Company, LLC, and new Special Purpose Entity, LLC*. On behalf of the Office of the People's Counsel. Issues: economic impact analysis, reliability, consumer investment fund, regulatory oversight, impacts to competitive electricity markets.

138. Expert Report. Civil Action 1:08-cv-0046 (2014). Before the U.S. District Court for the Southern District of Ohio. *Anthony Williams, et al., v. Duke Energy International, Inc., et al.* On behalf of Markovits, Stock & DeMarco, Attorneys & Counselors at Law. Issues: public utility regulation, electric power markets, economic harm.

139. Expert Testimony. D.P.U. 14-64 (2014). Before the Massachusetts Department of Public Utilities. *NSTAR Gas Company/HOPCO Gas Services Agreement. On behalf of the Office of the Public Advocate*. Issues: certain ratemaking features associated with the proposed Gas Service Agreement.

140. Expert Testimony. Docket Nos. 14-0224 and 14-0225 (2014). Before the Illinois Commerce Commission. *In the Matter of the Peoples Gas Light and Coke Company and North Shore Gas Company Proposed General Increase in Rates for Gas Service (consolidated)*. On behalf of the People of the State of Illinois. Issues: test year expenses, cost benchmarking analysis, pipeline replacement, and leak rate comparisons.

141. Expert Testimony. Docket 8191 (2014). Before the Vermont Public Service Board. *In Re: Petition of Green Mountain Power Corporation for Approval of a Successor Alternative Regulation Plan.* On the behalf of AARP-Vermont. Issues: Alternative Regulation.

142. Expert Testimony. Docket No. 2013-00168 (2014). Before the Maine Public Utilities Commission. *In the Matter of the Request for Approval of an Alternative Rate Plan (ARP 2014) Pertaining to Central Maine Power Company*. On behalf of the Office of the Public Advocate. Issues: class cost of service study, marginal cost of service study, revenue distribution and rate design.

143. Expert Testimony. D.P.U. 13-90 (2013). Before the Massachusetts Department of Public Utilities. *Petition of Fitchburg Gas and Electric Light Company (Electric Division) d/b/a Unitil to the Department of Public Utilities for approval of the rates and charges and increase in base distribution rates for electric service.* On behalf of the Office of the Ratepayer Advocate. Issues: capital cost adjustment mechanism and performance-based regulation.

144. Expert Testimony. BPU Docket Nos. EO13020155 and GO13020156. (2013). Before the

State of New Jersey Board of Public Utilities. *I/M/O The Petition of Public Service Electric & Gas Company for the Approval of the Energy Strong Program.* On behalf of the Division of Rate Counsel. Issues: economic impact, infrastructure replacement program rider, pipeline replacement, leak rate comparisons and cost benefit analysis.

145. Expert Testimony. D.P.U. 13-75 (2013). Before the Massachusetts Department of Public Utilities. *Investigation by the Department of Public Utilities on its Own Motion as to the Propriety of the Rates and Charges by Bay State Gas Company d/b/a Columbia Gas of Massachusetts set forth in Tariffs M.D.P.U. Nos. 140 through 173, and Approval of an Increase in Base Distribution Rates for Gas Service Pursuant to G.L. c. 164, § 94 and 220 C.M.R. § 5.00 et seq., filed with the Department on April 16, 2013, to be effective May 1, 2013*. On the Behalf of the Office of the Attorney General, Office of Ratepayer Advocacy. Issues: Target infrastructure replacement program rider, pipeline replacement, and leak rate comparisons; environmental benefits analysis; O&M offset; and cost benchmarking analysis.

146. Expert Testimony. Docket No. 13-115 (2013). Before the Delaware Public Service Commission. *In the Matter of the Application of Delmarva Power & Light Company FOR an Increase in Electric Base Rates and Miscellaneous Tariff Changes* (Filed March 22, 2013). On the Behalf of Division of the Public Advocate. Issues: pro forma infrastructure proposal, class cost of service study, revenue distribution, and rate design.

147. Expert Testimony. Formal Case No. 1103 (2013). Before the Public Service Commission of the District of Columbia. *In the Matter of the Application of the Potomac Electric Power Company for Authority to Increase Existing Retail Rates and Charges for Electric Distribution Service*. On the Behalf of the Office of the People's Counsel of the District of Columbia. Issues: Pro forma adjustment for reliability investments.

148. Expert Testimony. Case No. 9326 (2013). Before the Public Service Commission of Maryland. *In the Matter of the Application of Baltimore Gas and Electric Company for Adjustments to its Electric and Gas Base Rates*. On the Behalf of the Maryland Office of the People's Counsel. Issues: Electric Reliability Investment ("ERI") initiatives, pro forma gas infrastructure proposal, tracker mechanisms, class cost of service study, revenue distribution, and rate design

149. Rulemaking Testimony. (2013). Before the Louisiana Tax Commission. Examination of Louisiana Assessors' Association Well Diameter Analysis, economic development policies regarding midstream assets and industrial development.

150. Expert Testimony. Case No. 9317 (2013). Before the Public Service Commission of Maryland. *In the Matter of the Application of Delmarva Power & Light Company for Adjustments to its Retail Rates for the Distribution of Electric Energy*. Direct, and Surrebuttal. On the Behalf of the Maryland Office of the People's Counsel. Issues: Grid Resiliency Charge, tracker mechanisms, pipeline replacement, class cost of service study, revenue distribution, and rate design.

151. Expert Testimony. Case No. 9311 (2013). Before the Public Service Commission of Maryland. *In the Matter of the Application of Potomac Electric Power Company for an Increase in its Retail Rates for the Distribution of Electric Energy*. Direct, and Surrebuttal. On the Behalf of the Maryland Office of the People's Counsel. Issues: Grid Resiliency Charge, tracker mechanisms, pipeline replacement, class cost of service study, revenue distribution, and rate design.

C23-1851

152. Expert Testimony. Docket No. 12AL-1268G (2013). Before the Public Utilities Commission of the State of Colorado. *In the Matter of the Tariff Sheets Filed by Public Service Company of Colorado with Advice No. 830 – Gas. Answer*. On the Behalf of the Colorado Office of Consumer Counsel. Issues: Pipeline System Integrity Adjustment, tracker mechanisms, pipeline replacement and leak rate comparisons.

153. Expert Testimony. BPU Docket No. EO12080721 (2013). Before the New Jersey Board of Public Utilities. *In the Matter of the Public Service Electric & Gas Company for Approval of an Extension of Solar Generation Program*. On the Behalf of the New Jersey Division of Rate Counsel. Direct, Rebuttal, Surrebuttal. Issues: solar energy market design, solar energy market conditions, solar energy program design and net economic benefits.

154. Expert Testimony. BPU Docket No. EO12080726 (2013). Before the New Jersey Board of Public Utilities. *In the Matter of the Petition of Public Service Electric & Gas Company for Approval of a Solar Loan III Program.* On the Behalf of the New Jersey Division of Rate Counsel. Direct, Rebuttal and Surrebuttal. Issues: solar energy market design, solar energy market conditions, solar energy program design.

155. Expert Testimony. BPU Docket No. EO11050314V. (2012). Before the New Jersey Board of Public Utilities. *In the Matter of the Petition of Fishermen's Atlantic City Windfarm, LLC for the Approval of the State Waters Project and Authorizing Offshore Wind Renewable Energy Certificates*. On the Behalf of the New Jersey Division of Rate Counsel. December 17, 2012. Issues: approval of offshore wind project and ratepayer financial support for the proposed project.

156. Expert Testimony. D.P.U. 12-25. (2012). Before the Massachusetts Department of Public Utilities. *In the Matter of Bay State Gas Company d/b/a/ Columbia Gas Company of Massachusetts Request for Increase in Rates*. On the Behalf of the Office of the Attorney General, Office of Ratepayer Advocacy. Issues: Target infrastructure replacement program rider, pipeline replacement and leak rate comparisons.

157. Expert Testimony. Docket Nos. UE-120436, et.al. (consolidated). (2012). Before the Washington Utilities and Transportation Commission. *Washington Utilities and Transportation Commission v. Avista Corporation D/B/A Avista Utilities*. On the Behalf of the Washington Attorney General, Office of the Public Counsel. Issues: Revenue Decoupling, lost revenues, tracker mechanisms, attrition adjustments.

158. Expert Testimony. Case No. 9286. (2012) Before the Public Service Commission of Maryland. *In Re: Potomac Electric Power Company ("Pepco") General Rate Case*. On the Behalf of the Maryland Office of the People's Counsel. Issues: Capital tracker mechanisms/reliability investment mechanisms, reliability issues, regulatory lag, class cost of service, revenue distribution, rate design.

159. Expert Testimony. Case No 9285. (2012) Before the Public Service Commission of Maryland. *In Re: the Delmarva Power and Light Company General Rate Case*. On the Behalf of the Maryland Office of the People's Counsel. Issues: Capital tracker mechanisms/reliability investment mechanisms, reliability issues, regulatory lag, class cost of service, revenue distribution, rate design.

160. Expert Testimony. Docket Nos. UE-110876 and UG-110877 (consolidated). (2012). Before the Washington Utilities and Transportation Commission. *Washington Utilities and Transportation Commission v. Avista Corporation D/B/A Avista Utilities*. On the Behalf of the Washington Attorney General, Office of the Public Counsel. Issues: Revenue

Decoupling, lost revenues, tracker mechanisms.

161. Expert Testimony. BPU Docket No. EO11050314V. (2012). Before the New Jersey Board of Public Utilities. *In the Matter of the Petition of Fishermen's Atlantic City Windfarm, LLC for the Approval of the State Waters Project and Authorizing Offshore Wind Renewable Energy Certificates*. On the Behalf of the New Jersey Division of Rate Counsel. February 3, 2012. Issues: approval of offshore wind project and ratepayer financial support for the proposed project.

162. Expert Testimony. Docket No. NG 0067. (2012). Before the Public Service Commission of Nebraska. *In the Matter of the Application of SourceGas Distribution, LLC Approval of a General Rate Increase*. On the Behalf of the Public Advocate. January 31, 2012. Issues: Revenue Decoupling, Customer Adjustments, Weather Normalization Adjustments, Class Cost of Service Study, Rate Design.

163. Expert Testimony. Docket No. G-04204A-11-0158. (2011). Before the Arizona Corporation Commission. On the Behalf of the Arizona Corporation Commission Staff. *In the Matter of the Application of UNS Gas, Inc. for the Establishment of Just and Reasonable Rates and Charges Designed to Realize a Reasonable Rate of Return on the Fair Value of Its Arizona Properties*. Issues: Revenue Decoupling; Class Cost of Service Modeling; Revenue Distribution; Rate Design.

164. Expert Testimony. Formal Case Number 1087. (2011). Before the Public Service Commission of the District of Columbia. On the Behalf of the Office of the People's Counsel of the District of Columbia. *In the Matter of the Application of Potomac Electric Power Company for Authority to Increase Existing Retail Rates and Charges for Electric Distribution Service*. Issues: Regulatory lag, ratemaking principles, reliability-related capital expenditure tracker proposals.

165. Expert Affidavit. Case No. 11-1364. (2011). *The State of Louisiana, the Louisiana Department of Environmental Quality, and the Louisiana Public Service Commission v. United States Environmental Protection Agency and Lisa P. Jackson.* Before the United States Court of Appeals for the District of Columbia Circuit. On the behalf of the State of Louisiana, the Louisiana Department of Environmental Quality, and the Louisiana Public Service Commission. Issues: Impacts of environmental costs on electric utilities, compliance requirements, investment cost of mitigation equipment, multi-area dispatch modeling and plant retirements.

166. Expert Affidavit. Docket No. EPA-HQ-OAR-2009-0491. (2011). Before the U.S. Environmental Protection Agency. *Federal Implementation Plans: Interstate Transport of Fine Particulate Matter and Ozone and Correction of SIP Approvals*. On the Behalf of the Louisiana Public Service Commission. Issues: Impacts of environmental costs on electric utilities, compliance requirements, investment cost of mitigation equipment, multi-area dispatch modeling and plant retirements.

167. Expert Testimony. Case No. 9296. (2011). Before the Maryland Public Service Commission. *On the Behalf of the Maryland Office of People's Counsel. In the Matter of the Application of Washington Gas Light Company for Authority to Increase Existing Rates and Charges and Revise its Terms and Conditions for Gas Service*. Issues: Infrastructure Cost Recovery Rider; Class Cost of Service Modeling; Revenue Distribution; Rate Design.

168. Expert Testimony. Docket No. G-01551A-10-0458. (2011). Before the Arizona Corporation Commission. On the Behalf of the Arizona Corporation Commission Staff. *In*

the Matter of the Application of Southwest Gas Corporation for the Establishment of Just and Reasonable Rates and Charges Designed to Realize A Reasonable Rate of Return on the Fair Value of its Properties throughout Arizona. Issues: Revenue Decoupling; Class Cost of Service Modeling; Revenue Distribution; Rate Design.

169. Expert Testimony. Docket No. 11-0280 and 11-0281. (2011). Before the Illinois Commerce Commission. On the Behalf of the Illinois Attorney General, the Citizens Utility Board, and the City of Chicago, Illinois. *In re: Peoples Gas Light and Coke Company and North Shore Natural Gas Company*. Issues: Revenue Decoupling and Rate Design. (Direct and Rebuttal)

170. Expert Testimony. D.P.U. 11-01. (2011). Before the Massachusetts Department of Public Utilities. On the Behalf of the Office of the Attorney General, Office of Ratepayer Advocacy. *Petition of the Fitchburg Electric and Gas Company (Electric Division) for Approval of A General Increase in Electric Distribution Rates and Approval of a Revenue Decoupling Mechanism*. Issues: Capital Cost Rider, Revenue Decoupling.

171. Expert Testimony. D.P.U. 11-02. (2011). Before the Massachusetts Department of Public Utilities. On the Behalf of the Office of the Attorney General, Office of Ratepayer Advocacy. *Petition of the Fitchburg Electric and Gas Company (Gas Division) for Approval of A General Increase in Electric Distribution Rates and Approval of a Revenue Decoupling Mechanism*. Issues: Pipeline Replacement Rider, Revenue Decoupling.

172. Expert Affidavit. Docket No. EL-11-13 (2011). Before the Federal Energy Regulatory Commission. Petition for Preliminary Ruling, Atlantic Grid Operations. On the Behalf of the New Jersey Division of Rate Counsel. Issues: Offshore wind generation development, offshore wind transmission development, ratemaking treatment of development costs, transmission development incentives.

173. Expert Opinion. Case No. CI06-195. (2011). Before the District Court of Jefferson County, Nebraska. On the Behalf of the City of Fairbury, Nebraska and Michael Beachler. In re: Endicott Clay Products Co. vs. City of Fairbury, Nebraska and Michael Beachler. Issues: rate design and ratemaking, time of use and time differentiated rate structures, empirical analysis of demand and usage trends for tariff eligibility requirements.

174. Expert Testimony. D.P.U. 10-114. (2010). Before the Massachusetts Department of Public Utilities. On the Behalf of the Office of the Attorney General, Office of Ratepayer Advocacy. Petition of the New England Gas Company for Approval of A General Increase in Electric Distribution Rates and Approval of a Revenue Decoupling Mechanism. Issues: infrastructure replacement rider.

175. Expert Testimony. D.P.U. 10-70. (2010). Before the Massachusetts Department of Public Utilities. Petition of the Western Massachusetts Electric Company for Approval of A General Increase in Electric Distribution Rates and Approval of a Revenue Decoupling Mechanism. On the Behalf of the Office of the Attorney General, Office of Ratepayer Advocacy. Issues: Revenue decoupling; infrastructure replacement rider; performance-based regulation; inflation adjustment mechanisms; and rate design.

176. Expert Testimony. G.U.D. Nos. 998 & 9992. (2010). Before the Texas Railroad Commission. In the Matter of the Rate Case Petition of Texas Gas Services, Inc. On the Behalf of the City of El Paso, Texas. Issues: Cost of service, revenue distribution, rate design, and weather normalization.

C23-1854

177. Expert Testimony. B.P.U Docket No. GR10030225. (2010). Before the New Jersey Board of Public Utilities. In the Matter of the Petition of New Jersey Natural Gas Company for Approval of Regional Greenhouse Gas Initiative Programs and Associated Cost Recovery Mechanisms Pursuant to N.J.S.A. 48:3-98.1. On the Behalf of the Department of the Public Advocate, Division of Rate Counsel. Issues: solar energy proposals, solar securitization issues, solar energy policy issues.

178. Expert Testimony. D.P.U. 10-55. (2010). Before the Massachusetts Department of Public Utilities. Investigation Into the Propriety of Proposed Tariff Changes for Boston Gas Company, Essex Gas Company, and Colonial Gas Company. (d./b./a. National Grid). On the Behalf of the Office of the Attorney General, Office of Ratepayer Advocacy. Issues: Revenue decoupling; pipeline-replacement rider; performance-based regulation; partial productivity factor estimates, inflation adjustment mechanisms; and rate design.

179. Expert Testimony. Cause No.43839. (2010). Before the Indiana Utility Regulatory Commission. In the Matter of Southern Indiana Gas and Electric Company d/b/a/ Vectren Energy Delivery of Indiana, Inc. (Vectren South-Electric). On the behalf of the Indiana Office of Utility Consumer Counselor (OUCC). Issues: revenue decoupling, variable production cost riders, gains on off-system sales, transmission cost riders.

180. Congressional Testimony. Before the United States Congress. (2010). U.S. House of Representatives, Committee on Natural Resources. Hearing on the Consolidated Land, Energy, and Aquatic Resources Act. June 30, 2010.

181. Expert Testimony. Before the City Counsel of El Paso, Texas; Public Utility Regulatory Board. (2010). On the Behalf of the City of El Paso. In Re: Rate Application of Texas Gas Services, Inc. Issues: class cost of service study (minimum system and zero intercept analysis), rate design proposals, weather normalization adjustment, and its cost of service adjustment clause, conservation adjustment clause proposals, and other cost tracker policy issues.

182. Expert Testimony. Docket 09-00183. (2010). Before the Tennessee Regulatory Authority. In the Matter of the Petition of Chattanooga Gas Company for a General Rate Increase, Implementation of the EnergySMART Conservation Programs, and Implementation of a Revenue Decoupling Mechanism. On the Behalf of Tennessee Attorney General, Consumer Advocate & Protection Division. Issues: revenue decoupling and energy efficiency program review and cost effectiveness analysis.

183. Expert Testimony and Exhibits. Docket No. 10-240. (2010). Before the Louisiana Office of Conservation. In Re: Cadeville Gas Storage, LLC. On the Behalf of Cardinal Gas Storage, LLC. Issues: alternative uses and relative economic benefits of conversion of depleted hydrocarbon reservoir for natural gas storage purposes.

184. Expert Testimony. Docket No. 09505-EI. (2010). Before the Florida Public Service Commission. In Re: Review of Replacement Fuel Costs Associated with the February 26, 2008 outage on Florida Power & Light's Electrical System. On the Behalf of the Florida Office of Public Counsel for the Citizens of the State of Florida. Issues: Replacement costs for power outage, regulatory policy/generation development incentives, renewable and energy efficiency incentives.

185. Expert Report, Recommendation, and Proposed Rule: Docket Number R-29380-A, ex parte, (2009). Before the Louisiana Public Service Commission. In re: Environmental Adjustment Clause and Environmental Certification for Electric Power Generation

Resources. On the behalf of the Louisiana Public Service Commission Staff. Report and Recommendation. Issues: environmental regulation and cost recovery; allowance allocations and air credit markets cost recovery treatment; other generation planning issues.

186. Expert Testimony. Docket 09-00104. (2009). Before the Tennessee Regulatory Authority. In the Matter of the Petition of Piedmont Natural Gas Company, Inc. to Implement a Margin Decoupling Tracker Rider and Related Energy Efficiency and Conservation Programs. On the Behalf of the Tennessee Attorney General, Consumer Advocate & Protection Division. Issues: revenue decoupling, energy efficiency program review, weather normalization.

187. Expert Testimony. Docket Number NG-0060. (2009). Before the Nebraska Public Service Commission. In the Matter of SourceGas Distribution, LLC Approval for a General Rate Increase. On the Behalf of the Nebraska Public Advocate. October 29, 2009. Issues: revenue decoupling, inflation trackers, infrastructure replacement riders, customer adjustment rider, weather normalization rider, weather normalization adjustments, estimation of normal weather for ratemaking purposes.

188. Expert Report and Deposition. Before the 23rd Judicial District Court, Parish of Assumption, State of Louisiana. On the Behalf of Dow Hydrocarbons and Resources, Inc. September 1, 2009. (Deposition, November 23-24, 2009). Issues: replacement and repair costs for underground salt cavern hydrocarbon storage.

189. Expert Testimony. D.P.U. 09-39. Before the Massachusetts Department of Public Utilities. (2009). Investigation Into the Propriety of Proposed Tariff Changes for Massachusetts Electric Company and Nantucket Electric Company (d./b./a. National Grid). On the Behalf of the Office of the Attorney General, Office of Ratepayer Advocacy. Issues: Revenue decoupling; infrastructure rider; performance-based regulation; inflation adjustment mechanisms; revenue distribution; and rate design.

190. Expert Testimony. D.P.U. 09-30. Before the Massachusetts Department of Public Utilities. (2009). In the Matter of Bay State Gas Company Request for Increase in Rates. On the Behalf of the Office of the Attorney General, Office of Ratepayer Advocacy. Issues: Revenue decoupling; target infrastructure replacement program rider; revenue distribution; and rate design.

191. Expert Testimony. Docket EO09030249. (2009). Before the New Jersey Board of Public Utilities. In the Matter of the Petition of Public Service Electric and Gas Company for Approval of a Solar Loan II Program and An Associated Cost Recovery Mechanism. On the Behalf of the Department of the Public Advocate, Division of Rate Counsel. Issues: solar energy market design, renewable portfolio standards, solar energy, and renewable financing/loan program design.

192. Expert Testimony. Docket EO0920097. (2009). Before the New Jersey Board of Public Utilities. In the Matter of the Verified Petition of Rockland Electric Company for Approval of an SREC-Based Financing Program and An Associated Cost Recovery Mechanism. On the Behalf of the Department of the Public Advocate, Division of Rate Counsel. Issues: solar energy market design; renewable energy portfolio standards; solar energy.

193. Expert Rebuttal Report. Civil Action No.: 2:07-CV-2165. (2009). Before the U.S. District Court, Western Division of Louisiana, Lake Charles Division. Prepared on the Behalf of the Transcontinental Pipeline Corporation. Issues: expropriation and industrial use of property.

C23-1856

194. Expert Testimony. Docket EO06100744. (2008). Before the New Jersey Board of Public Utilities. In the Matter of the Renewable Portfolio Standard – Amendments to the Minimum filing Requirements for Energy Efficiency, Renewable Energy, and Conservation Programs and For Electric Distribution Company Submittals of Filings in connection with Solar Financing (Atlantic City Electric Company). On the Behalf of the Department of the Public Advocate, Division of Rate Counsel. Issues: Solar energy market design; renewable energy portfolio standards; solar energy. (Rebuttal and Surrebuttal)

195. Expert Testimony. Docket EO08090840. (2008). Before the New Jersey Board of Public Utilities. In the Matter of the Renewable Portfolio Standard – Amendments to the Minimum filing Requirements for Energy Efficiency, Renewable Energy, and Conservation Programs and For Electric Distribution Company Submittals of Filings in connection with Solar Financing (Jersey Central Power & Light Company). On the Behalf of the Department of the Public Advocate, Division of Rate Counsel. Issues: Solar energy market design; renewable energy portfolio standards; solar energy. (Rebuttal and Surrebuttal)

196. Expert Testimony. Docket UG-080546. (2008). Before the Washington Utilities and Transportation Commission. On the Behalf of the Washington Attorney General (Public Counsel Section). Issues: Rate Design, Cost of Service, Revenue Decoupling, Weather Normalization.

197. Congressional Testimony. (2008). Senate Republican Conference: Panel on Offshore Drilling in the Restricted Areas of the Outer Continental Shelf. September 18, 2008.

198. Expert Testimony. Appeal Number 2007-125 and 2007-299. (2008). Before the Louisiana Tax Commission. On the Behalf of Jefferson Island Storage and Hub, LLC (AGL Resources). Issues: Valuation Methodologies, Underground Storage Valuation, LTC Guidelines and Policies, Public Purpose of Natural Gas Storage. July 15, 2008 and August 20, 2008.

199. Expert Testimony. Docket Number 07-057-13. (2008). Before the Utah Public Service Commission. In the Matter of the Application of Questar Gas Company to File a General Rate Case. On the Behalf of the Utah Committee of Consumer Services. Issues: Cost of Service, Rate Design. August 18, 2008 (Direct, Rebuttal, Surrebuttal).

200. Rulemaking Testimony. (2008). Before the Louisiana Tax Commission. Examination of Replacement Cost Tables, Depreciation and Useful Lives for Oil and Gas Properties. Chapter 9 (Oil and Gas Properties) Section. August 5, 2008.

201. Legislative Testimony. (2008). Examination of Proposal to Change Offshore Natural Gas Severance Taxes (HB 326 and Amendments). Joint Finance and Appropriations Committee of the Alabama Legislature. March 13, 2008.

202. Public Testimony. (2007). Issues in Environmental Regulation. Testimony before Gubernatorial Transition Committee on Environmental Regulation (Governor-Elect Bobby Jindal). December 17, 2007.

203. Public Testimony. (2007). Trends and Issues in Alternative Energy: Opportunities for Louisiana. Testimony before Gubernatorial Transition Committee on Natural Resources (Governor-Elect Bobby Jindal). December 13, 2007.

204. Expert Report and Recommendation: Docket Number S-30336 (2007). Before the Louisiana Public Service Commission. In re: Entergy Gulf States, Inc. Application for

Approval of Advanced Metering Pilot Program. Issues: pilot program for demand response programs and advanced metering systems.

205. Expert Testimony. Docket EO07040278 (2007). Before the New Jersey Board of Public Utilities. In the Matter of the Petition of Public Service Electric & Gas Company for Approval of a Solar Energy Program and An Associated Cost Recovery Mechanism. On the Behalf of the Department of the Public Advocate, Division of Rate Counsel. Issues: renewable energy market development, solar energy development, SREC markets, rate impact analysis, cost recovery issues.

206. Expert Testimony: Docket Number 05-057-T01 (2007). Before the Utah Public Service Commission. In the Matter of: Joint Application of Questar Gas Company, the Division of Public Utilities, and Utah Clean Energy for Approval of the Conservation Enabling Tariff Adjustment Options and Accounting Orders. On the behalf of the Utah Committee of Consumer Services. Issues: Revenue Decoupling, Demand-side Management; Energy Efficiency policies. (Direct, Rebuttal, and Surrebuttal Testimony)

207. Expert Testimony (Non-sworn rulemaking testimony) Docket Number RR-2008, (2007). Before the Louisiana Tax Commission. In re: Commission Consideration of Amendment and/or Adoption of Tax Commission Real/Personal Property Rules and Regulations. Issues: Louisiana oil and natural gas production trends, appropriate cost measures for wells and subsurface property, economic lives and production decline curve trends.

208. Expert Report, Recommendation, and Proposed Rule: Docket Number R-29213 & 29213-A, ex parte, (2007). Before the Louisiana Public Service Commission. In re: In re: Investigation to determine if it is appropriate for LPSC jurisdictional electric utilities to provide and install time-based meters and communication devices for each of their customers which enable such customers to participate in time-based pricing rate schedules and other demand response programs. On the behalf of the Louisiana Public Service Commission Staff. Report and Recommendation. Issues: demand response programs, advanced meter systems, cost recovery issues, energy efficiency issues, regulatory issues.

209. Expert Report, Recommendation, and Proposed Rule: Docket Number R-29712, ex parte, (2007) Before the Louisiana Public Service Commission. In re: Investigation into the ratemaking and generation planning implications of nuclear construction in Louisiana. On the behalf of the Louisiana Public Service Commission Staff. Report and Recommendation. Issues: nuclear cost power plant development, generation planning issues, and cost recovery issues.

210. Expert Testimony, Case Number U-14893, (2006). Before the Michigan Public Service Commission. In the Matter of SEMCO Energy Gas Company for Authority to Redesign and Increase Its Rates for the Sale and Transportation of Natural Gas In its MPSC Division and for Other Relief. On the behalf of the Michigan Attorney General. Issues: Rate Design, revenue decoupling, financial analysis, demand-side management program and energy efficiency policy. (Direct and Rebuttal Testimony).

211. Expert Report, Recommendation, and Proposed Rule: Docket Number R-29380, ex parte, (2006). Before the Louisiana Public Service Commission. In re: An Investigation Into the Ratemaking and Generation Planning Implications of the U.S. EPA Clean Air Interstate Rule. On the behalf of the Louisiana Public Service Commission Staff. Report and Recommendation. Issues: environmental regulation and cost recovery; allowance

allocations and air credit markets; ratepayer impacts of new environmental regulations.

212. Expert Affidavit Before the Louisiana Tax Commission (2006). On behalf of ANR Pipeline, Tennessee Gas Transmission and Southern Natural Gas Company. Issues: Competitive nature of interstate and intrastate transportation services.

213. Expert Affidavit Before the 19th Judicial District Court (2006). Suit Number 491, 453 Section 26. On behalf of Transcontinental Pipeline Corporation, et.al. Issues: Competitive nature of interstate and intrastate transportation services.

214. Expert Testimony: Docket Number 05-057-T01 (2006). Before the Utah Public Service Commission. In the Matter of: Joint Application of Questar Gas Company, the Division of Public Utilities, and Utah Clean Energy for Approval of the Conservation Enabling Tariff Adjustment Options and Accounting Orders. On the behalf of the Utah Committee of Consumer Services. Issues: Revenue Decoupling, Demand-side Management; Energy Efficiency policies. (Rebuttal and Supplemental Rebuttal Testimony)

215. Legislative Testimony (2006). Senate Committee on Natural Resources. Senate Bill 655 Regarding Remediation of Oil and Gas Sites, Legacy Lawsuits, and the Deterioration of State Drilling.

216. Expert Report: Rulemaking Docket (2005). Before the New Jersey Bureau of Public Utilities. In re: Proposed Rulemaking Changes Associated with New Jersey's Renewable Portfolio Standard. Expert Report. The Economic Impacts of New Jersey's Proposed Renewable Portfolio Standard. On behalf of the New Jersey Office of Ratepayer Advocate. Issues: Renewable Portfolio Standards, rate impacts, economic impacts, technology cost forecasts.

217. Expert Testimony: Docket Number 2005-191-E. (2005). Before the South Carolina Public Service Commission. On behalf of NewSouth Energy LLC. In re: General Investigation Examining the Development of RFP Rules for Electric Utilities. Issues: Competitive bidding; merchant development. (Direct and Rebuttal Testimony).

218. Expert Testimony: Docket No. 05-UA-323. (2005). Before the Mississippi Public Service Commission. On the behalf of Calpine Corporation. In re: Entergy Mississippi's Proposed Acquisition of the Attala Generation Facility. Issues: Asset acquisition; merchant power development; competitive bidding.

219. Expert Testimony: Docket Number 050045-EI and 050188-EI. (2005). Before the Florida Public Service Commission. On the behalf of the Citizens of the State of Florida. In re: Petition for Rate Increase by Florida Power & Light Company. Issues: Load forecasting; O&M forecasting and benchmarking; incentive returns/regulation.

220. Expert Testimony (non-sworn, rulemaking): Comments on Decreased Drilling Activities in Louisiana and the Role of Incentives. (2005). Louisiana Mineral Board Monthly Docket and Lease Sale. July 13, 2005

221. Legislative Testimony (2005). Background and Impact of LNG Facilities on Louisiana. Joint Meeting of Senate and House Natural Resources Committee. Louisiana Legislature. May 19, 2005.

222. Public Testimony. Docket No. U-21453. (2005). Technical Conference before the Louisiana Public Service Commission on an Investigation for a Limited Industrial Retail Choice Plan.

223. Expert Testimony: Docket No. 2003-K-1876. (2005). On Behalf of Columbia Gas Transmission. Expert Testimony on the Competitive Market Structure for Gas Transportation Service in Ohio. Before the Ohio Board of Tax Appeals.

224. Expert Report and Testimony: Docket No. 99-4490-J, *Lafayette City-Parish Consolidated Government, et. al. v. Entergy Gulf States Utilities, Inc. et. al*. (2005, 2006). On behalf of the City of Lafayette, Louisiana and the Lafayette Utilities Services. Expert Rebuttal Report of the Harborfront Consulting Group Valuation Analysis of the LUS Expropriation. Filed before 15th Judicial District Court, Lafayette, Louisiana.

225. Expert Testimony: ANR Pipeline Company v. Louisiana Tax Commission (2005), Number 468,417 Section 22, 19th Judicial District Court, Parish of East Baton Rouge, State of Louisiana Consolidated with Docket Numbers: 480,159; 489,776;480,160; 480,161; 480,162; 480,163; 480,373; 489,776; 489,777; 489,778;489,779; 489,780; 489,803; 491,530; 491,744; 491,745; 491,746; 491,912;503,466; 503,468; 503,469; 503,470; 515,414; 515,415; and 515,416. In re: Market structure issues and competitive implications of tax differentials and valuation methods in natural gas transportation markets for interstate and intrastate pipelines.

226. Expert Report and Recommendation: Docket No. U-27159. (2004). On Behalf of the Louisiana Public Service Commission Staff. Expert Report on Overcharges Assessed by Network Operator Services, Inc. Before the Louisiana Public Service Commission.

227. Expert Testimony: Docket Number 2004-178-E. (2004). Before the South Carolina Public Service Commission. On behalf of Columbia Energy LLC. In re: Rate Increase Request of South Carolina Electric and Gas. (Direct and Surrebuttal Testimony)

228. Expert Testimony: Docket Number 040001-EI. (2004). Before the Florida Public Service Commission. On behalf of Power Manufacturing Systems LLC, Thomas K. Churbuck, and the Florida Industrial Power Users Group. In re: Fuel Adjustment Proceedings; Request for Approval of New Purchase Power Agreements. Company examined: Florida Power & Light Company.

229. Expert Affidavit: Docket Number 27363. (2004). Before the Public Utilities Commission of Texas. Joint Affidavit on Behalf of the Cities of Texas and the Staff of the Public Utilities Commission of Texas Regarding Certified Issues. In Re: Application of Valor Telecommunications, L.P. For Authority to Establish Extended Local Calling Service (ELCS) Surcharges For Recovery of ELCS Surcharge.

230. Expert Report and Testimony. Docket 1997-4665-PV, 1998-4206-PV, 1999-7380-PV, 2000-5958-PV, 2001-6039-PV, 2002-64680-PV, 2003-6231-PV. (2003) Before the Kansas Board of Tax Appeals. (2003). In the Matter of the Appeals of CIG Field Services Company from orders of the Division of Property Valuation. On the Behalf of CIG Field Services. Issues: the competitive nature of natural gas gathering in Kansas.

231. Expert Report and Testimony: Docket Number U-22407. Before the Louisiana Public Service Commission (2002). On the Behalf of the Louisiana Public Service Commission Staff. Company examined: Louisiana Gas Services, Inc. Issues: Purchased Gas Acquisition audit, fuel procurement and planning practices.

232. Expert Testimony: Docket Number 000824-EI. Before the Florida Public Service Commission. (2002). On the Behalf of the Citizens of the State of Florida. Company examined: Florida Power Corporation. Issues: Load Forecasts and Billing Determinants

C23-1860

for the Projected Test Year.

233. Public Testimony: Louisiana Board of Commerce and Industry (2001). Testimony on the Economic Impacts of Merchant Power Generation.

234. Expert Testimony: Docket Number 24468. (2001). On the Behalf of the Texas Office of Public Utility Counsel. Public Utility Commission of Texas Staff's Petition to Determine Readiness for Retail Competition in the Portion of Texas Within the Southwest Power Pool. Company examined: AEP-SWEPCO.

235. Expert Report. (2001) On Behalf of David Liou and Pacific Richland Products, Inc. to Review Cogeneration Issues Associated with Dupont Dow Elastomers, L.L.C. (DDE) and the Dow Chemical Company (Dow).

236. Expert Testimony: Docket Number 01-1049, Docket Number 01-3001. (2001) On behalf the Nevada Office of Attorney General, Bureau of Consumer Protection. Petition of Central Telephone Company-Nevada D/b/a Sprint of Nevada and Sprint Communications L.P. for Review and Approval of Proposed Revised Performance Measures and Review and Approval of Performance Measurement Incentive Plans. Before the Public Utilities Commission of Nevada.

237. Expert Affidavit: Multiple Dockets (2001). Before the Louisiana Tax Commission. On the Behalf of Louisiana Interstate Pipeline Companies. Testimony on the Competitive Nature of Natural Gas Transportation Services in Louisiana.

238. Expert Affidavit before the Federal District Court, Middle District of Louisiana (2001). Issues: Competitive Nature of the Natural Gas Transportation Market in Louisiana. On behalf of a Consortium of Interstate Natural Gas Transportation Companies.

239. Public Testimony: Louisiana Board of Commerce and Industry (2001). Testimony on the Economic and Ratepayer Benefits of Merchant Power Generation and Issues Associated with Tax Incentives on Merchant Power Generation and Transmission.

240. Expert Testimony: Docket Number 01-1048 (2001). Before the Public Utilities Commission of Nevada. On the Behalf of the Nevada Office of the Attorney General, Bureau of Consumer Protection. Company analyzed: Nevada Bell Telephone Company. Issues: Statistical Issues Associated with Performance Incentive Plans.

241. Expert Testimony: Docket 22351 (2001). Before the Public Utility Commission of Texas. On the Behalf of the City of Amarillo. Company analyzed: Southwestern Public Service Company. Issues: Unbundled cost of service, affiliate transactions, load forecasting.

242. Expert Testimony: Docket 991779-EI (2000). Before the Florida Public Service Commission. On the Behalf of the Citizens of the State of Florida. Companies analyzed: Florida Power & Light Company; Florida Power Corporation; Tampa Electric Company; and Gulf Power Company. Issues: Competitive Nature of Wholesale Markets, Regional Power Markets, and Regulatory Treatment of Incentive Returns on Gains from Economic Energy Sales.

243. Expert Testimony: Docket 990001-EI (1999). Before the Florida Public Service Commission. On the Behalf of the Citizens of the State of Florida. Companies analyzed: Florida Power & Light Company; Florida Power Corporation; Tampa Electric Company; and Gulf Power Company. Issues: Regulatory Treatment of Incentive Returns on Gains from Economic Energy Sales.

244. Expert Testimony: Docket 950495-WS (1996). Before the Florida Public Service Commission. On the Behalf of the Citizens of the State of Florida. Company analyzed: Southern States Utilities, Inc. Issues: Revenue Repression Adjustment, Residential and Commercial Demand for Water Service.

245. Legislative Testimony. Louisiana House of Representatives, Special Subcommittee on Utility Deregulation. (1997). On Behalf of the Louisiana Public Service Commission Staff. Issue: Electric Restructuring.

246. Expert Testimony: Docket 940448-EG -- 940551-EG (1994). Before the Florida Public Service Commission. On the Behalf of the Legal Environmental Assistance Foundation. Companies analyzed: Florida Power & Light Company; Florida Power Corporation; Tampa Electric Company; and Gulf Power Company. Issues: Comparison of Forecasted Cost-Effective Conservation Potentials for Florida.

247. Expert Testimony: Docket 920260-TL, (1993). Before the Florida Public Service Commission. On the Behalf of the Florida Public Service Commission Staff. Company analyzed: BellSouth Communications, Inc. Issues: Telephone Demand Forecasts and Empirical Estimates of the Price Elasticity of Demand for Telecommunication Services.

248. Expert Testimony: Docket 920188-TL, (1992). Before the Florida Public Service Commission. On the Behalf of the Florida Public Service Commission Staff. Company analyzed: GTE-Florida. Issues: Telephone Demand Forecasts and Empirical Estimates of the Price Elasticity of Demand for Telecommunication Services.

REFEREE AND EDITORIAL APPOINTMENTS

Contributor, 2014-2018, *Wall Street Journal*, *Journal Reports*, Energy

Editorial Board Member, 2015-2017, *Utilities Policy*

Referee, 2014-Current, *Utilities Policy*

Referee, 2010-Current, *Economics of Energy & Environmental Policy*

Referee, 1995-Current*, Energy Journal*

Contributing Editor, 2000-2005, *Oil, Gas and Energy Quarterly*

Referee, 2005, *Energy Policy*

Referee, 2004, *Southern Economic Journal*

Referee, 2002, *Resource & Energy Economics*

Committee Member, IAEE/USAEE Student Paper Scholarship Award Committee, 2003

PROPOSAL TECHNICAL REVIEWER

California Energy Commission, Public Interest Energy Research (PIER) Program (1999).

PROFESSIONAL ASSOCIATIONS

American Economic Association, American Statistical Association, Southern Economic Association, Western Economic Association, International Association of Energy Economists

("IAEE"), United States Association of Energy Economics ("USAEE"), the National Association for Business Economics ("NABE"), and the Energy Bar Association (National and Louisiana Chapter; current Board member of LA chapter).

HONORS AND AWARDS

Baton Rouge Business Report, Selected as one of the "Capital Region 500" (2023).

National Association of Regulatory Utility Commissioners (NARUC). Best Paper Award for papers published in the *Journal of Applied Regulation* (2004).

Baton Rouge Business Report, Selected as "Top 40 Under 40" (2003).

Omicron Delta Epsilon (1992-Current).

Interstate Oil and Gas Compact Commission (IOGCC) "Best Practice" Award for Research on the Economic Impact of Oil and Gas Activities on State Leases for the Louisiana Department of Natural Resources (2003).

Distinguished Research Award, Academy of Legal, Ethical and Regulatory Issues, Allied Academics (2002).

Florida Public Service Commission, Staff Excellence Award for Assistance in the Analysis of Local Exchange Competition Legislation (1995).

TEACHING EXPERIENCE

Energy and the Environment (Survey Course)

Principles of Microeconomic Theory

Principles of Macroeconomic Theory

Lecturer, Environmental Management and Permitting. Lecture in Natural Gas Industry, LNG and Markets.

Lecturer, Electric Power Industry Environmental Issues, Field Course on Energy and the Environment. (Dept. of Environmental Studies).

Lecturer, Electric Power Industry Trends, Principles Course in Power Engineering (Dept. of Electric Engineering).

Lecturer, LSU Honors College, Senior Course on "Society and the Coast."

Continuing Education. Electric Power Industry Restructuring for Energy Professionals.

"The Gulf Coast Energy Situation: Outlook for Production and Consumption." Educational Course and Lecture Prepared for the Foundation for American Communications and the Society for Professional Journalists, New Orleans, LA, December 2, 2004

"The Impact of Hurricane Katrina on Louisiana's Energy Infrastructure and National Energy Markets." Educational Course and Lecture Prepared for the Foundation for American Communications and the Society for Professional Journalists, Houston, TX, September 13, 2005.

"Forecasting for Regulators: Current Issues and Trends in the Use of Forecasts, Statistical, and Empirical Analyses in Energy Regulation." Instructional Course for State Regulatory Commission Staff. Institute of Public Utilities, Kellogg Center, Michigan State University. July 8-9, 2010.

"Regulatory and Ratemaking Issues with Cost and Revenue Trackers." Michigan State University, Institute of Public Utilities. Advanced Regulatory Studies Program. September 29, 2010.

"Demand Modeling and Forecasting for Regulators." Michigan State University, Institute of Public Utilities. Advanced Regulatory Studies Program. September 30, 2010.

"Demand Modeling and Forecasting for Regulators." Michigan State University, Institute of Public Utilities, Forecasting Workshop, Charleston, SC. March 7-9, 2011.

"Regulatory and Cost Recovery Approaches for Smart Grid Applications." Michigan State University, Institute of Public Utilities, Smart Grid Workshop for Regulators. Charleston, SC. March 7-11, 2011.

"Regulatory and Ratemaking Issues Associated with Cost and Expense Adjustment Mechanisms." Michigan State University, Institute of Public Utilities, Advanced Regulatory Studies Program. Lansing, Michigan. September 28, 2011.

"Utility Incentives, Decoupling, and Renewable Energy Programs." Michigan State University, Institute of Public Utilities, Advanced Regulatory Studies Program. Lansing, Michigan. September 29, 2011.

"Regulatory and Cost Recovery Approaches for Smart Grid Applications." Michigan State University, Institute of Public Utilities, Smart Grid Workshop for Regulators. Charleston, SC. March 6-8, 2012.

"Traditional and Incentive Ratemaking Workshop." New Mexico Public Utilities Commission Staff. Santa Fe, NM October 18, 2012.

"Traditional and Incentive Ratemaking Workshop." New Jersey Board of Public Utilities Staff. Newark, NJ. March 1, 2013.

"Natural Gas Issues and Recent Market Trends." Michigan State University Institute of Public Utilities, GridSchool Regulatory Studies Program, East Lansing, Mich., March 29, 2017.

"Gas Supply Planning and Procurement: Regulatory Overview and issues." Michigan State University Institute of Public Utilities, Basic Regulatory Studies Program, East Lansing, Mich., Aug 17, 2017.

"Natural Gas Supply Issues and Challenges." Michigan State University Institute of Public Utilities, Basic Regulatory Studies Program, East Lansing, Mich., Aug 17, 2017.

"Incentives, Risk and Changes in the Nature of Regulation." Michigan State University Institute of Public Utilities, Basic Regulatory Studies Program, East Lansing, Mich., Aug 18, 2017.

"Traditional and Alternative Forms of Regulation: Background and Overview." Michigan State University Institute of Public Utilities, Advanced Regulatory Studies Program, East Lansing, Mich., October 2, 2017.

"Traditional and Alternative Forms of Regulation: Utility and policy motivations for risk and change." Michigan State University Institute of Public Utilities, Advanced Regulatory Studies Program, East Lansing, Mich., October 2, 2017.

"Traditional and Alternative Forms of Regulation: Incentives and Formula Based Methods." Michigan State University Institute of Public Utilities, Advanced Regulatory Studies Program, East Lansing, Mich., October 2, 2017.

THESIS/DISSERTATIONS COMMITTEES

Active:
1 Thesis Committee Memberships (Environmental Studies)
2 Ph.D. Dissertation Committee (Economics)
Completed:
8 Thesis Committee Memberships (Environmental Studies, Geography)
4 Doctoral Committee Memberships (Information Systems & Decision Sciences, Agricultural and Resource Economics, Economics, Education and Workforce Development).
2 Doctoral Examination Committee Membership (Information Systems & Decision Sciences, Education and Workforce Development)
1 Senior Honors Thesis (Journalism, Loyola University)

LSU SERVICE AND COMMITTEE MEMBERSHIPS

Committee Member, Energy Education Curriculum Committee. E.J. Ourso College of Business. LSU (2016-Current).

Chairman, LSU Energy Initiative/LSU Energy Council (2014-Current).

Co-Director & Steering Committee Member, LSU Coastal Marine Institute (2009-2014).

CES Promotion Committee, Division of Radiation Safety (2006).

Search Committee Chair (2006), Research Associate 4 Position.

Search Committee Member (2005), Research Associate 4 Position.

Search Committee Member (2005), CES Communications Manager.

LSU Graduate Research Faculty, Associate Member (1997-2004); Full Member (2004-2010); Affiliate Member with Full Directional Rights (2011-2014); Full Member (2014-current).

LSU Faculty Senate (2003-2006).

Conference Coordinator. (2005-Current) Center for Energy Studies Conference on Alternative Energy.

LSU CES/SCE Public Art Selection Committee (2003-2005).

Conference Coordinator. Center for Energy Studies Annual Energy Conference/Summit. (2003-Current).

Conference Coordinator. Center for Energy Studies Seminar Series on Electric Utility Restructuring and Wholesale Competition. (1996-2003).

Co-Chairman, Review Committee, Louisiana Port Construction and Development Priority Program Rules and Regulations, On Behalf of the LSU Ports and Waterways Institute. (1997).

LSU Main Campus Cogeneration/Turbine Project, (1999-2000).

LSU InterCollege Environmental Cooperative. (1999-2001).

LSU Faculty Senate Committee on Public Relations (1997-1999).

LSU Faculty Senate Committee on Student Retention and Recruitment (1999-2003).

PROFESSIONAL SERVICE

Board Member (2018). Energy Bar Association, Louisiana Chapter.

Program Committee Member (2017). Gulf Coast Power Association Conference. New Orleans.

Program Committee Member (2016). Gulf Coast Power Association Conference. New Orleans.

Program Committee Member (2015). Gulf Coast Power Association Workshop/Special Briefing. "Gulf Coast Disaster Readiness: A Past, Present and Future Look at Power and Industry Readiness in MISO South."

Advisor (2008). National Association of Regulatory Utility Commissioners. Study Committee on the Impact of Executive Drilling Moratoria on Federal Lands.

Steering Committee Member, Louisiana Representative (2008-Current). Southeast Agriculture & Forestry Energy Resources Alliance. Southern Policies Growth Board.

Advisor (2007-Current). National Association of State Utility Consumer Advocates ("NASUCA"), Natural Gas Committee.

Program Committee Chairman (2007-2008). U.S. Association of Energy Economics ("USAEE") Annual Conference, New Orleans, LA

Finance Committee Chairman (2007-2008). USAEE Annual Conference, New Orleans, LA

Committee Member (2006), International Association for Energy Economics Nominating Committee.

Founding President (2005-2007) Louisiana Chapter, USAEE.

Secretary (2001) Houston Chapter, USAEE.

Advisor, Louisiana LNG Buyers/Developers Summit, Office of the Governor/Louisiana Department of Economic Development/Louisiana Department of Natural Resources, and Greater New Orleans, Inc. (2004).

(Whereupon, prefiled direct testimony of William W. Dunkel was inserted.)

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In Re: Petition for rate increase by Duke Energy Florida, Inc. /	Docket No. 20240025-EI FILED: June 11, 2024

CONFIDENTIAL PER DESIGNATION OF THE COMPANY

DIRECT TESTIMONY

OF

WILLIAM W. DUNKEL

ON BEHALF

OF

THE CITIZENS OF THE STATE OF FLORIDA

Walt Trierweiler
Public Counsel

Charles J. Rehwinkel
Deputy Public Counsel

Mary A. Wessling
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Attorneys for the Citizens of the State of Florida

Table of Contents

C24-1967

I. Introduction

Q. Please state your name and business address.

A. My name is William W. Dunkel. My business address is 8625 Farmington Cemetery Road, Pleasant Plains, Illinois 62677.

Q. Have you prepared a summary of your qualifications and experience, including a list of prior regulatory proceedings in which you have participated?

A. Yes. Exhibit WWD-1 is a summary of my qualifications, experience, and a list of prior testimonies before state utility regulatory agencies. As shown in Exhibit WWD-1, for several decades I have participated in numerous state regulatory proceedings nationwide. I have participated in proceedings before approximately half of the state utility regulatory commissions in the nation.

I graduated from the University of Illinois with a Bachelor of Science Degree in Engineering. For several years, I was a design engineer designing electric watt-hour meters used in the electric utility industry. I was granted patent No. 3822400 for a solid-state meter pulse initiator which was used in electric utility metering.

Q. Are you a member of a depreciation professional organization?

A. Yes. I am a member in good standing of the Society of Depreciation Professionals. My firm was invited to make a presentation to the Society of Depreciation Professionals annual

C24-1968

convention in Indianapolis, Indiana, pertaining to depreciation issues in state proceedings, which I co-presented on September 17, 2018.

Q. On whose behalf are you providing testimony?

A. I am testifying on behalf of the Office of the Public Counsel of the State of Florida ("OPC").

Q. What is the purpose of your testimony?

A. One purpose of this testimony is to address depreciation rates and to recommend appropriate depreciation rates for Duke Energy Florida ("DEF"). This testimony responds to the Direct Testimony of Ned W. Allis ("Allis direct"), the DEF Depreciation Study (Exhibit No. NWA-1), and related workpapers, discovery responses, and other related information. I also recommend specific, appropriate depreciation rates for DEF.

I also address the DEF 2023 Dismantlement Cost Study (Exhibit JTK-2) ("dismantlement study"), and the associated Direct Testimony of Jeffery T. Kopp ("Kopp direct"), and related workpapers, discovery responses, and other related information. I also recommend specific, appropriate dismantlement costs for the DEF production facilities.

C24-1969

Q. Could you please provide the definition of depreciation?

A. Yes. The definition contained in the FERC Uniform System of Accounts states the following:

> 12. Depreciation, as applied to depreciable electric plant, means the loss in service value not restored by current maintenance, incurred in connection with the consumption or prospective retirement of electric plant in the course of service from causes which are known to be in current operation and against which the utility is not protected by insurance. Among the causes to be given consideration are wear and tear, decay, action of the elements, inadequacy, obsolescence, changes in the art, changes in demand and requirements of public authorities.[1]

Q. Are the procedures and techniques you utilized consistent with prior Florida Public Service Commission ("Commission") orders?

A. Yes. My recommended depreciation rates are determined based on the straight-line method, average service life (also known as "broad group") procedure, and the remaining life technique.[2] This is consistent with prior depreciation rates adopted by the Commission. I follow the requirements of the FERC Uniform System of Accounts.[3] My proposed depreciation rates are consistent with recommendations contained in "Public Utility Depreciation Practices," published by the National Association of Regulatory Utility Commissioners (NARUC).[4]

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[1] Uniform System of Accounts Prescribed for Public Utilities and Licensees Subject to the Provisions of the Federal Power Act, 18 C.F.R. pt. 101(12).

[2] These are the same method, procedure, and technique used by Mr. Allis, as stated on page 8, lines 15-16 of his direct testimony.

[3] Uniform System of Accounts Prescribed for Public Utilities and Licensees Subject to the Provisions of the Federal Power Act, 18 C.F.R. pt. 101.

[4] "Public Utility Depreciation Practices," published by the National Association of Regulatory Utility Commissioners. (1996).

C24-1970

Q. Are your proposed depreciation rates just and reasonable?

A. Yes. I am familiar with preparing just and reasonable rates. In the past ten years, my firm has participated nationwide on behalf of the commission or commission staff in approximately half of our proceedings. The U.S. Supreme Court stated:

> [T]he fixing of 'just and reasonable' rates, involves a balancing of the investor and the consumer interests.[5]

I prepare depreciation rates which are proper, and which reasonably balance investor and consumer interests.

II. Mr. Allis Assumed the Anclote Plant Would Retire Years Before DEF Expected It to Retire

Q. What did Mr. Allis do which greatly overstated his claimed depreciation rates for the Anclote steam production plant?[6]

A. Mr. Allis calculated his claimed depreciation rates using an assumed retirement year which is several years prior to when DEF expects this Anclote plant to retire. Using an earlier retirement date in the depreciation rate calculations increases the calculated depreciation rates.

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[5] *Federal Power Commission v. Hope Natural Gas Co*., 320 U.S. 591, 603 (1944).
[6] The Anclote steam production plant consists of two gas-fired steam production units, Unit 1 and Unit 2.

Q. What probable retirement year for Anclote did Mr. Allis use to calculate the depreciation rates he filed?

A. Mr. Allis used 2029 as the Anclote Probable Retirement Year for purposes of calculating his proposed depreciation rates. That fact he used 2029 as the Probable Retirement Year can be seen on page 37 of Mr. Allis' depreciation study, Exhibit NWA-1.[7]

Q. When Mr. Allis was preparing his depreciation study, was it already publicly known that DEF did <u>not</u> expect the Anclote plant to retire in 2029?

A. Yes. Mr. Allis' cover letter transmitting his depreciation study to DEF is dated August 23, 2023.[8] More than three years prior to that, in April 2020, the Duke Energy Florida Ten-Year Site Plan, which covered the DEF plans for the years 2020 through 2029, showed that DEF did **<u>not</u>** expect Anclote to retire any time during that period, which is through 2029.[9] More than three years prior to Mr. Allis completing his depreciation study, it was public knowledge that DEF did **<u>not</u>** expect Anclote to retire in 2029.

[7] You can also see Mr. Allis actually used 2029 in the Anclote calculations on page 53 of his Exhibit NWA-1.
[8] Page 3 of Exhibit NWA-1.
[9] Duke Energy Florida, LLC, Ten-Year Site Plan, dated April, 2020, page 1-3, shows both Anclote Unit 1 and Anclote Unit 2 remaining in service throughout the planning period, which is through 2029.

C24-1972

Q. Did subsequent DEF Ten-Year Site Plans continue to show that DEF expected the Anclote plant to be in service after 2029?

A. Yes. The subsequent DEF Ten-Year Site Plans all continued to show that DEF expected the Anclote plant to be in service after 2029. For example, the DEF Ten-Year Site Plan covering the years 2023-2032, shows that DEF did **not** expect Anclote to retire any time during that period, which is through 2032.[10] In other words, DEF expected Anclote to at least still be in service on January 1, 2033. This Ten-Year Site Plan covering the years 2023-2032 was transmitted to the Commission by DEF on April 3, 2023, which is several months prior to Mr. Allis submitting his depreciation study to DEF on August 23, 2023.[11]

Q. What is Exhibit WWD-2?

A. This exhibit contains pages from the DEF Ten-Year Site Plan dated April, 2022 covering the years 2022-2031, which shows that DEF did not expect Anclote to retire any time during that period, which is through 2031.

DEF provided this DEF Ten-Year Site Plan, on April 1, 2022. This was a public document a year and several months **prior** to Mr. Allis sending his depreciation study to DEF on August 23, 2023.

[10] Duke Energy Florida, LLC, Ten-Year Site Plan, dated April, 2023, page 1-3, shows both Anclote Unit 1 and Anclote Unit 2 remaining in service throughout the planning period, which is through 2032.
[11] The prior DEF Ten-Year Site Plan, dated April, 2022, page 1-3, shows both Anclote Unit 1 and Anclote Unit 2 remaining in service throughout the planning period, which is through 2031.

C24-1973

Page 1-3 shows DEF expected both Anclote Unit 1 and Anclote Unit 2 to remain in service throughout the planning period, which was through 2031.

This is just one of the several DEF Ten-Year Site Plans from years prior to Mr. Allis' depreciation study that showed that DEF did not expect to retire Anclote in 2029. More than three years prior to Mr. Allis completing his depreciation study, it was public knowledge, from several different DEF Ten-Year Site Plans, that DEF did **not** expect Anclote to retire in 2029 and expected it to still be in service after 2029.

Q. What happened when you, through the OPC, pointed out the Anclote retirement date discrepancy between Mr. Allis' depreciation study and the DEF Ten-Year Site Plans?

A. After we demonstrated this discrepancy, DEF answered:

> c. The 2029 probable retirement date is the same estimate as used for the current depreciation rates. The Company's current planning horizon is for a 2042 retirement date, which is the most reasonable expectation based on information currently available, and **the retirement date for this facility should be updated to 2042**.[12] (Emphasis added)

Q. How much did Mr. Allis using a 2029 probable retirement date in his Anclote calculations increase the claimed depreciation expense?

A. The documents DEF provided with its response to OPC's Sixth Set of Interrogatories, No. 139 show that the steam production depreciation expense is **$29 million higher** when 2029

[12] DEF response to OPC's Sixth Set of Interrogatories, No. 139. Attached as Exhibit WWD-3.

is used as the Anclote probable retirement year, compared to using 2042 as the probable retirement year.

<u>III. Mr. Allis Knew the DEF Expectations When He Used the Earlier Retirement Date.</u>

Q. Had DEF provided Mr. Allis DEF's estimated retirement dates while he was preparing his depreciation study?

A. Yes. When asked about the probable retirement dates of the production units used in the depreciation study, the DEF response was:

> a. The Company provided estimated retirement dates for production units, which were then discussed with Mr. Allis. The proposed retirement dates are based on both the Company's and Mr. Allis's expertise.[13]

Mr. Allis was provided the Company "estimated retirement dates for production units," but instead he chose to use in his calculations a probable retirement date of 2029, using "Mr. Allis' expertise." By using that improper earlier retirement date in his depreciation calculations, Mr. Allis improperly overstated the depreciation expense by $29 million per year for Anclote.

*** BEGIN CONFIDENTIAL PER DEF DESIGNATION***

[redacted]

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[13] DEF response to OPC's Sixth Set of Interrogatories, No. 138. Included in Exhibit WWD-3.

[redacted]

*** END CONFIDENTIAL PER DEF DESIGNATION***

Q. In your calculations, what probable retirement date did you use for the Anclote production plant?

A. Consistent with the DEF expectations, I used 2042 as the probable retirement date in my calculations. I removed the $29 million annual overstatement of Anclote depreciation expense which is included in Mr. Allis' proposed depreciation rates.

IV. Mr. Allis Ignored $12 Million Annual Positive Net Salvage-Prime Movers-General

Q. Is there another issue in which Mr. Allis' recommendation is clearly inconsistent with the actual data?

A. Yes. Data provided by DEF in response to discovery shows that in Account 343.00, Prime Movers-General, DEF benefits from positive net salvage which has averaged $12,450,761 per year.[14] This is a positive number, which means it is to DEF's benefit; it is not an amount DEF is to pay out.

[14] This $12,450,761 per year is the average for the most recent five years, as shown on page 6 of Exhibit WWD-4, which is from the DEF response to OPC Sixth Set of Interrogatories, No. 126.

C24-1976

Q. What is Exhibit WWD-4?

A. Exhibit WWD-4 is the DEF discovery response which shows the positive net salvage that has averaged $12,450,761 per year in Account 343.00, Prime Movers- General.[15]

Q. What did Mr. Allis do when calculating his proposed depreciation rates [that would be recovered from ratepayers through depreciation expense]?

A. Mr. Allis pretended this $12 million per year positive net salvage did not exist. In his proposed calculations he uses the net salvage for Account 343.00, Prime Movers-General as zero.[16]

Q. Please provide an analogy to what Mr. Allis is doing.

A. Assume a medical provider received a payment from an insurance company for services provided to a certain patient. However, when billing that patient, the medical provider pretended that the payment from the insurance company was $0. That would be a clear overcharge and is analogous to what Mr. Allis is attempting in this case in Account 343.00, Prime Movers-General.

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[15] This $12,450,761 per year is the average for the most recent five years, as shown on page 6 of Exhibit WWD-4, which is from the DEF response to OPC Sixth Set of Interrogatories, No. 126.

[16] His use of 0 occurs in the Net Salvage column of Account 343.00, Prime Movers-General on several lines on pages 53-57 of Exhibit NWA-1.

Q. What analysis of the actual DEF data did Mr. Allis prepare in the Prime Mover accounts?

A. In his depreciation study Mr. Allis stated that he had done a separate net salvage analysis for the Rotable Prime Mover (Account 343.10-Prime Mover-Rotable Parts), and a separate net salvage analysis for the remainder of the Prime Mover account (Account 343.00-Prime Mover – General).[17] However, he did not show these two analyses in his depreciation study. We have obtained those two analyses through discovery.[18]

The figure below compares Mr. Allis recommendations to the key results shown on his own analyses.

Figure 1- Account 343 Net Salvage

			Mr. Allis' Analysis[19]	
		Mr. Allis' Recommendation	Last 5 Years	All Years
343.00	**Prime Movers – General**	**0%**	**36%**	**35%**
343.10	Prime Movers - Rotable	40%	36%	57%

Even his own analysis, for what that is worth, comes nowhere near supporting Mr. Allis' zero net salvage recommendation for Account 343.00, Prime Movers-General.[20]

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[17] Pages 544-546 of Exhibit NWA-1.
[18] Exhibit WWD-4, which is from the DEF response to OPC's Sixth Set of Interrogatories, No. 126.
[19] Exhibit WWD-4, which is from the DEF response to OPC's Sixth Set of Interrogatories, No. 126.
[20] This does not imply I support his net salvage analysis method, but this shows the net salvage analysis even prepared by Mr. Allis using his preferred method does not support his zero net salvage recommendation in Account 343.00, Prime Movers-General.

C24-1978

Q. What is the result of Mr. Allis calculating his proposed Prime Mover-General depreciation rates using a zero net salvage?

A. Mr. Allis is ignoring the over $12 million per year average positive net salvage that occurs in the real-world Account 343.00-Prime Mover – General. By pretending the net salvage is zero for purposes of his calculations, he overstates the depreciation expense in this account by several million dollars per year.

I recommend **not** pretending the net salvage is zero, when in the real world the positive net salvage averages over $12 million per year in Account 343.00-Prime Mover – General.

V. Mr. Allis Says the Life Range for Battery Storage Is 10 To 20 Years. He Used 10 Years.

Q. What does Mr. Allis' depreciation study say about the life of utility battery storage?

A. Page 538 of his depreciation study states:

> ***Battery Storage***
>
> The Company has added battery storage assets to its system since the prior depreciation study. A typical service life for these types of assets is in the 10 to 20 year range. The 10-S3 survivor curve is recommended with 0 net salvage.

The "10-S3 survivor curve" means Mr. Allis used a 10-year average service life in his depreciation rate calculations.

The U.S. Supreme Court stated:

> [T]he fixing of 'just and reasonable' rates, involves a balancing of the investor and the consumer interests.[21]

[21] *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591, 603 (1944).

Mr. Allis states the "typical service life for these types of assets is in the 10 to 20 year range." Selecting the 10-year extreme is not a reasonable "balancing of the investor and the consumer interests."

Q. What does the DEF filing show is the current approved life for the DEF battery storage?

A. Mr. Allis' depreciation study shows 15-S3 is the current survivor curve for Account 348-Battery Storage.[22] "15-S3" includes a 15-year average service life.

Q. What life do you recommend for the depreciation rate calculations?

A. I recommend the continued use of the 15-S3 survivor curve.

VI. Life of Solar Farms

Q. What life does Mr. Allis use for all DEF solar farms?

A., Mr. Allis uses a 30-year life for all DEF solar farms, even for the newest solar production facilities, including those DEF plans to build in 2024.[23]

[22] Page 65 of Exhibit NWA-1.
[23] Page 38-39, Exhibit NWA-1.

Q. Has the technology of solar production been improving over time?

A. Yes. The technology for solar production has been improving over time, resulting in a longer expected life span for the newer solar facilities.

As an example of longer lives, Maxeon solar panels are have a warranty that they will still be producing at an 88.25% power level at age 40 years.[24]

Q. What does research funded by the U.S. Department of Energy say about the increase in the life of solar production facilities?

A. For several years the U.S. Department of Energy has funded the Lawrence Berkeley National Laboratory (LBNL) research of the Utility-Scale Solar production facilities. The recent LBNL release, "Utility-Scale Solar, 2022 Edition" states the:

> **[P]roject life increases** from 21.5 years in 2007 **to 35 years in 2021** (both based on prior LBNL research).[25]

Q. What life have you used in your recommendations?

A. For DEF solar production facilities installed **prior** to the year 2021, I use a 30-year average service life, which is the same life Mr. Allis uses.

For the DEF solar production facilities installed in the year 2021 or later, I use a 35-year average service life. My treatment is consistent with the U.S. Department of Energy

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[24] To be clear, the end of a warranty period is not necessarily the end of the useful life.
[25] Page 27, Utility-Scale Solar, 2022 Edition, LBNL. (Emphasis added). Attached Exhibit WWD-5 is from this LBNL 2022 Edition.

funded research which shows that the service life of the newer solar production facilities is longer than the service life of the earlier solar production facilities. Specifically the expected life is "35 years in 2021."

VII. Life of Base Load Production Units

Q. In the past what type of units were many of the base load units?

A. In the past, many base load units were steam production units.[26]

Q. How long did the steam production units live, based on DEF actual experience?

A. The lives of the DEF steam production units averaged over 50 years. Two steam production units in this case are Anclote units 1 and 2 (natural gas fired). These units have expected life spans of 64 and 68 years.[27]

The other two steam production units in this case are Crystal River units 4 &5 (coal fired) and they are expected to have a life span of 52 years.[28]

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[26] DEF also had a nuclear unit in the past, but it is retired.
[27] Anclote Unit 1 went in service in 1974 and is expected to retire in 2042 (per the DEF response to OPC Sixth Set of Interrogatories, No. 139, which is Exhibit WWD-3), a life of 68 years. Anclote unit 2 went in service in 1978 and is expected to retire in 2042, a life of 64 years. DEF now classifies the Anclote units as intermediate units per page 16 of MFR Schedule B-7.
[28] Exhibit NWA-1, page 37. DEF classifies the Crystal River units as base load units per page 16 of MFR Schedule B-7 ("CR" = Crytal River).

Q. What type of units are most of the DEF base load units now?

A. Other than the Crystal River steam plant, and a small University of Florida unit, all of the DEF base load units are now combined cycle units.[29]

Q. What is one characteristic of base load units?

A. Base load units general do not have to "load follow." Starts, and large, rapid changes in power output, can create stress in a production unit.

Q. Please demonstrate from discovery in this case that the number of starts are significant for a production unit.

A. In response to discovery, DEF stated:

> For Intercession City Unit P11 as with all DEF's simple cycle CTs, the Company determines maintenance cycles and inspections based on industry defined intervals. These are different for each of the various OEM providers of the hardware. For Intercession City Unit P11 and other Siemens units, the Company uses **starts-based inspection cycles**, run time, and results from minor inspections.[30] (Emphasis added).

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[29] Page 15-16 of MFR Schedule B-7. The Unit Type is shown on page 1-3 of the DEF April 2024 Ten Year Site Plan.
[30] DEF response to OPC's Sixth Set of Interrogatories 128 (d).

Q. What is one thing that is done which allows base load production units to have average lifespans of over 50 years in real world operations?

A. From time-to-time production units are taken offline, with components being inspected, repaired and /or replaced as appropriate.[31] The turbines maybe opened to allow access to the interior. The "interim retirements" that occurred during this process are included in the depreciation calculations, in addition to the portion of the calculations which is based upon the lifespan.

Q. In the DEF depreciation study, what life span is used to calculate the depreciation rates for the combined cycle production units?

A. In the DEF depreciation study, Mr. Allis used a 40-year life span to calculate the depreciation rates for all combined cycle production units.[32]

In the 2021 case, Mr. Allis was using a 35-year life span to calculate the depreciation rates for each combined cycle production unit. The settlement of that case took a step in the right direction and moved the life span of combined cycle production units to 40 years for purposes of calculating the depreciation rates.[33]

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[31] A similar process also occurs for peaker and intermediate production units.
[32] Page 38 of Exhibit in NWA-1.
[33] Page 20, Order No. PSC-2021-0202A-AS-EI, Docket Nos. 20190110-EI, 20190222-EI, and 20210016-EI.

C24-1984

Q. In his testimony Mr. Allis refers to Florida Power and Light's combined cycle plants. He says Lauderdale Units 4 and 5 both had life spans of 25 years.[34] Did Lauderdale Units 4 and 5 have life spans of only 25 years?

A. No. These Florida Power and Light Lauderdale units were constructed in the 1950s.[35] They retired in 2018. They had life spans somewhere near 60 years.

These units were repowered in 1993, but they had already been in service for several decades prior to 1993.[36]

Q. What life span do you recommend for the DEF combined cycle production units?

A. Almost all of the DEF combined cycle production units are base load units.[37] I recommend that a life span of 45 years be used in the depreciation rate calculations for the combined cycle production units.

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[34] Page 23, direct testimony of Mr. Allis.
[35] DEF response to OPC's Fifth Set of Interrogatories, No. 86.
[36] DEF response to OPC's Fifth Set of Interrogatories, No. 86.
[37] Except for Tiger Bay, all DEF combined cycle production units are base load units. Tiger Bay contains only 4% of the DEF combined cycle MWs. (199 Tiger Bay MW/5,247 Combined Cycle MW=3.8%). Data from page 1-3 of DEF's April 2024 Ten-Year Site Plan.

VIII. Efficient Use of The Simple Cycle Depreciation Reserve

Q. Did DEF move some depreciation reserve amounts among accounts which were in the same plant category?

A. Yes. I am not objecting to that. This is sometimes referred to as "redistributing" the depreciation reserve. DEF "considered the theoretical reserve for adjustments between accounts" when redistributing the depreciation reserve amounts.[38] One example is that the Book Depreciation Reserve amounts for the General Plant accounts used on page 59 of Mr. Allis' depreciation study[39] are the amounts after the depreciation reserve has been redistributed by DEF.[40] I am not objecting to that.

Q. Did you redistribute the depreciation reserve within the Simple Cycle Production Plant category?

A. Yes. After replacing the zero net salvage that Mr. Allis had used for Account 343.00 Prime Movers-General with the corrected net salvage, I then redistributed the Simple Cycle Production Plant book reserve amount among the accounts in the Simple Cycle Production Plant category. I redistributed based on the relative Theoretical Reserve Amount of each account. This redistribution of the Simple Cycle Production Plant depreciation reserve is shown on Exhibit WWD-6.

[38] DEF response to OPC's Sixth Set of Interrogatories, No. 131.
[39] Page 59, Exhibit NWA-1.
[40] The redistribution of the depreciation reserve by DEF is shown in the DEF workpaper "DEF-2022-2024 Balance Rollforward."

Q. Does this redistribution of the Simple Cycle Production Plant depreciation reserve change the total amount of Simple Cycle Production Plant depreciation reserve?

A. No. In the DEF depreciation study the total Simple Cycle Production Plant depreciation reserve used in calculating the depreciation rates is $457,228,937.[41] The total Simple Cycle Production Plant depreciation reserve used in my calculation of the depreciation rates is the same amount: $457,228,937.

I recommend the redistribution of the Simple Cycle Production Plant depreciation reserve as shown on Exhibit WWD-6 be adopted.

IX. Conclusion on Depreciation Rates

Q. What depreciation rates do you recommend?

A. For the reasons discussed above, I recommend the OPC Depreciation Rates shown on Exhibit WWD-7. The following Figure compares the annual depreciation expense at the current depreciation rates, the DEF proposed depreciation rates, and the OPC proposed depreciation rates. Please note that these depreciation expense figures are based on the investment level as of December 31, 2024. The dollar impact in the rate case may differ because of a different investment level being used. The actual calculation of the depreciation expense using the OPC's proposed rates is included in the testimony of other witnesses.

[41] Exhibit NWA-1, page 57.

Figure #2. Comparison

		DEF Proposed		OPC Proposed		
	Current Rates Annual Accrual	Annual Accrual	Different from Current	Annual Accrual	Different from Current	Different from DEF
Steam Production	174,860,964	180,512,441	5,651,477	151,256,545	(23,604,419)	(29,255,896)
Combined Cycle Prod.	190,475,733	180,552,327	(9,923,406)	154,968,136	(35,507,597)	(25,584,191)
Simple Cycle Prod.	28,693,842	29,268,649	574,807	15,273,900	(13,419,942)	(13,994,749)
Solar Production	71,875,738	73,156,757	1,281,019	63,851,314	(8,024,424)	(9,305,443)
Transmission Plant	154,685,725	170,566,999	15,881,274	170,566,999	15,881,274	0
Distribution Plant	301,517,713	344,247,111	42,729,398	341,373,023	39,855,310	(2,874,088)
General Plant	20,847,967	16,623,426	(4,224,541)	16,623,426	(4,224,541)	0
Total Depreciable	942,957,682	994,927,710	51,970,028	913,913,343	(29,044,339)	(81,014,367)

X. Dismantlement Cost Study Double Recovery of Dismantlement Costs of Solar Farms On Leased Property

Q. Does DEF have Asset Retirement Obligations (ARO) for some Solar production farms?

A. Yes. DEF has AROs for certain DEF Solar production farms which are located on leased property.[42] Twin Rivers Solar is one example of a DEF Solar production facility which is located on leased property and for which DEF has an ARO for the asset retirement obligation.[43]

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[42] As listed by DEF in response to OPC's Tenth Set of Interrogatories, No. 261. (A public response). Also see DEF Schedule B-24, which shows "leasing arrangement" for "land" of these solar production facilities.
[43] DEF in response to OPC's Tenth Set of Interrogatories, No. 261. (A public response). Also see DEF Schedule B-24.

C24-1988

Q. What are the ARO obligations for these DEF Solar production facilities which are located on leased property?

A. DEF stated:

> Costs are recorded as ARO because it qualifies as a legal obligation associated with **<u>the retirement of</u>** a tangible long lived asset[44] (Emphasis added).

In addition, DEF's public response states the lease agreement for Twin Rivers solar includes a section "Lessee's Obligation to Restore the Property."[45]

These ARO's are for DEF's "Obligation to Restore the Property" upon "the retirement of" these solar farms.

Q. How will DEF recover from ratepayers the ARO cost "associated with the retirement of a tangible long lived asset" of these Solar production farms?

A. When asked how these solar ARO costs are recovered in the revenue requirement, DEF responded:

> Accretion and depreciation are deferred for recovery in a future rate case.[46]

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[44] DEF response to OPC's Tenth Set of Interrogatories, No. 262, part (d) under "Other Production Plant." (A public response).
[45] DEF response to OPC's Tenth Set of Interrogatories, No. 263, part (d).
[46] DEF response to OPC's Tenth Set of Interrogatories, No. 261 parts (e) and (b) under "Other" [production facilities]. (A public response). The ARO costs are referred to as "Accretion and Depreciation."

C24-1989

Q. Are the dismantlement costs of the same DEF solar farms on leased land also included for recovery from ratepayers in Mr. Kopp's Dismantlement Cost Study in this proceeding?

A. Yes. On page 155 of Exhibit JTK-2, Mr. Kopp shows the Solar Decommissioning Cost Summary for Twin River Solar. These Twin River Solar decommissioning cost are flowed through his calculations and are included in the dismantlement costs DEF would recover from the ratepayers in this proceeding.

Q. What is the problem?

A. Recovering the Twin River Solar dismantlement costs from ratepayers through Mr. Kopp's dismantlement study and also recovering the "Lessee's Obligation to Restore the Property" of Twin River Solar through the ARO process, is a proposed double recovery of the same future activity. This is also true for the many other DEF solar farms which are on leased property.

Q. Have you corrected this proposed double recovery?

A. Yes. For the solar production farms which have ARO's, I excluded their future dismantlement costs from my corrected Dismantlement Cost study. I am not objecting to

C24-1990

these ARO dismantlement/retirement cost obligation being recovered from ratepayers through the ARO process.[47]

Q. Are actual land leases for some of the DEF solar farms available in the confidential files?

A. Yes. Although I have had no need to refer to them in the prior discussion, DEF states the actual leases are available in the Confidential files for three of the DEF solar plants that are on leased land. Regarding three of these solar farms, DEF was asked:

> Cite to each page and specific provision of the Lease Agreement which contains the lease term which stipulates what removal of facilities is required at the end of the lease.

DEF's (public) response is:

> Charlie Creek: See page 7 of the contract file, paragraph 9 (b) "Surrender of Land."
>
> Twin Rivers: See page 9 of the contract file, paragraph 6.4 "Lessee's Obligation to Restore the Property."
>
> Sandy Creek: See page 9 of the contract file, paragraph 8.10 "Removal of Improvements."[48]

*** BEGIN CONFIDENTIAL PER DEF DESIGNATION***

[redacted]

[redacted]

*** END CONFIDENTIAL PER DEF DESIGNATION***

<u>XI. Neither Mr. Kopp Nor 1898 & Co Have Ever Participated In an Actual Dismantlement</u>

Q. What did DEF provide pertaining to the future dismantlement of production facilities?

A. DEF filed the 2023 Dismantlement Cost Study, prepared by Mr. Kopp of a firm named "1898 & Co." DEF recommends that significant charges to the ratepayers be based on the Dismantlement Cost estimates prepared by Mr. Kopp of "1898 & Co."

[redacted]

C24-1992

Q. Has Mr. Kopp ever participated in the actual dismantlement of a utility production facility?

A. No. In response to discovery, DEF answered:

> Jeffrey Kopp has not participated in projects during the physical dismantlement of a utility owned production unit.[50]

Q. Has 1898 & Co. ever participated in the actual dismantlement of a utility production facility?

A. No. In response to discovery, DEF answered:

> 1898 & Co. has not participated in projects during the actual physical dismantlement of a utility-owned production unit.[51]

Q. In the future, when DEF actually physically has these production units dismantled, will the actual demolition contractor have to follow the assumptions Mr. Kopp created in his Dismantlement Cost Study?

A. No. Mr. Kopp's exhibit states:

> A summary of several of the means and methods **that could be employed** is summarized in the following paragraphs; **however, means and methods will not be dictated to the contractor by 1898 & Co. It will be the contractor's responsibility to determine means and methods** that result in safely dismantling the Plants at the lowest possible cost.[52] (Emphasis added).

[50] DEF response to OPC's Tenth Set of Interrogatories, No. 245. This response is included in Exhibit WWD-8.
[51] DEF response to OPC's Tenth Set of Interrogatories, No. 246. This response is included in Exhibit WWD-8.
[52] Page 100 of Exhibit No. JTK-2.

The purpose of Mr. Kopp's Dismantlement Cost Study is **not** to create a plan that the later actual physical dismantlement would follow. In the future it "will be the contractor's responsibility" to do that.

The purpose of the Dismantlement Cost Study is to prepare numbers to be used to collect money from ratepayers.

XII. Experience Shows That DEF Has Been Consistently Over Recovering For Dismantlement

Q. Is there a good way to evaluate the reasonableness of Mr. Kopp's dismantlement cost estimates?

A. Yes. Mr. Kopp has been preparing and testifying on Dismantlement Cost estimates for DEF for many years, starting with Docket No 20090079-EI.[53] Some of the DEF production units for which in the past he prepared Dismantlement Cost estimates, have since **actually** been physically completely dismantled. The DEF books show the actual costs of the later actual physical dismantlement. These facts show that Mr. Kopp's Dismantlement Cost estimates overestimated what the actual physical dismantlement later cost. As a result DEF over collected from ratepayers for dismantlement costs.

[53] Page 4, lines 14-15, direct testimony of Mr. Kopp.

Q. Can you demonstrate that DEF over collected from ratepayers for dismantlement costs on the production units which have been actually physically dismantled?

A. Yes. Page 74 of Mr. Kopps's Exhibit No. JTK-2 shows that DEF over collected from ratepayers for dismantlement costs on the production units which have been actually physically dismantled. For convenient reference, I have attached a copy of that page to this testimony as Exhibit WWD-9.

Q. What does this show?

A. This shows five DEF production facilities which have now been actually physically dismantled. For each of these facilities their dismantlement is complete, as is shown by the fact that the column which is entitled "Future To Dismantle" has zero ("-") in it.

This document reveals that after the actual physical dismantlement, the DEF dismantlement depreciation reserve for these facilities contained a total "**Surplus**" of over seven million dollars. Of course, the money in the DEF dismantlement depreciation reserve is the money that had been collected from ratepayers for the purpose of dismantling these five DEF production facilities. The fact there is a **Surplus** means that DEF over collected from ratepayer for the dismantlement of these facilities.

Q. Does the similar page from the <u>prior</u> DEF Dismantlement Study also show DEF over collected for dismantlement?

A. Yes. The similar page from the prior DEF Dismantlement Study shows that there was a total "**<u>Surplus</u>**" in excess of $25 million for the DEF production facilities which had been actually physically dismantled, as shown in that DEF Dismantlement Study. DEF is continually over collecting from ratepayers for future dismantlement.

Q. What is Exhibit WWD-10?

A. Exhibit WWD-10 contains pages from the prior 2020 DEF Dismantlement Study, which is Exhibit 6 in the Commission Order No. PSC-2021-0202A-AS-EI in the prior DEF case.[54] The last page of this Exhibit shows there was a total "**<u>Surplus</u>**" in excess of $25 million in the dismantlement depreciation reserve of the production facilities which had been actually physically dismantled. DEF is continually over collecting from ratepayers for future production plant dismantlement.

Mr. Kopp has been testifying for DEF on the DEF dismantlement studies since Docket No 20090079-EI.[55]

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[54] In Docket Nos. 20190110-EI, Docket Nos. 20190110-EI, and 20210016-EI.
[55] Page 4, lines 14-15, direct testimony of Jeffery T. Kopp.

Q. What do these facts mean?

A. Obviously, we can no longer just accept Mr. Kopp's estimates as a valid cost to be recovered from ratepayers. Known facts prove DEF is continually over collecting from ratepayers for future production plant dismantlement. There is a saying which is "fool me once, shame on you. Fool me twice, shame on me."

Q. What do you recommend in response to the fact that Mr. Kopp's Dismantlement Cost Estimates are clearly excessive?

A. It is clear that substantial adjustments need to be made. There is no valid way to evaluate many parts of his estimates. For example, it would be impractical to go through each item in a project and discuss the number of person-hours Mr. Kopp says it will take to dismantle that item. For purposes of this case, I have made this obviously needed adjustment by including no contingency and no claimed stranded inventory. Both of these areas are highly speculative, as will be discussed.

These two adjustments are steps in the correct direction of reducing his provably excessive dismantlement cost estimates.

XIII. Claimed Contingency Cost

Q. Mr. Kopp adds a 20% "Contingency Cost" to the costs he has otherwise estimated. What does he say this Contingency Cost is for?

A. Mr. Kopp states:

> "A 20 percent contingency is included on the direct costs in the estimates prepared as part of this Study to cover unknowns."[56]

Q. Under the DEF proposal, would these unknown costs be recovered from the ratepayers?

A. Yes. Under the DEF proposal, these "unknowns" are to be recovered from the ratepayers.

Q. What is one obvious problem with this DEF proposal?

A. Ratepayers' rates are expected to be cost-based. Charging ratepayers for "unknowns" is not setting valid cost-based rates. Imagine what DEF would say if an intervenor proposed **reducing** rates based on "unknowns."[57] Likewise DEF should not be allowed to increase rates charged to ratepayers based on "unknowns."

Q. Do the charges to ratepayers treat these contingency costs as if they might or might not occur?

A. No. Ratepayers are charged these contingency costs in a way that effectively assumes they are 100% certain to occur. That is speculation and is unsupported.

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[56] Page 104, Exhibit No. JTK-2.
[57] I am **not** proposing reducing rates based on "unknowns."

Q. Does DEF's Power Generation organization include contingency costs in its projects?

A. No. In response to discovery, DEF said:

> Generation: DEF's Power Generation Organization **does not include contingency costs** when developing cost estimates for capital projects. If the actual costs exceed the budgeted amount, the project manager will initiate an Extra Work Authorization ("EWA") in order to update the expected cost of the capital project.[58] (Emphasis added).

This response pertains to generation facilities, which is the same category of facilities the dismantlement studies are addressing.

Q. Please summarize this issue.

A. 1. We have demonstrated that DEF is continuously over collecting from ratepayers for dismantlement costs. Adjustments are needed.

2. Proper cost-based rates cannot be based on "unknowns."

3. Regarding production facilities, DEF's Power Generation Organization does not include contingency costs when developing cost estimates for capital projects.

For these reasons, I have not included claimed contingency costs in the dismantlement cost estimates.

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[58] DEF response to OPC's Tenth Set of Interrogatories, No. 267.

C24-1999

XIV. Inventory Costs

Q. What is another amount Mr. Kopp adds into the claimed dismantlement cost estimates?

A. Mr. Kopp includes claimed Plant Inventory costs.

Q. What are the Plant Inventory costs he includes?

A. Mr. Kopp states:

> Site inventory values have been provided by DEF and are included in the study as a plant cost. 1898 & Co. assumes 25 percent of the plant inventory value for combustion turbine facilities will be recovered as a scrap credit and 10 percent of the inventory for the other facilities.[59]

Q. What is a major reason you are excluding plant inventory from the dismantlement costs?

A. We have demonstrated that DEF is continuously over collecting from ratepayers for dismantlement costs. Adjustments are needed.

Q. Is including the Plant Inventory in the claimed DEF Dismantlement cost relatively new?

A. Yes. A DEF discovery response says:

> "DEF first included inventories in the current Dismantlement Study."[60]

[59] Page 103, Exhibit No. JTK-2.
[60] DEF response to OPC's Tenth Set of Interrogatories, No. 252.

The prior DEF Dismantlement Study (in the 2021 case) included something they called "Plant End of Life Inventory Cost."[61] What Mr. Kopp includes in the current study is the current inventory, which later in the calculations gets increased for future inflation.

Q. Is it certain that a utility will maintain the normal level of inventory for a production plant as the planned final retirement date for that plant approaches?

A. No. That is not certain. In fact, Mr. Kopp's exhibit says it is assumed:

> DEF will remove or consume all burnable coal, fuel oil and chemicals to the reasonable extent possible prior to commencement of demolition activities.[62]

Q. What else does the plant inventory treatment Mr. Kopp includes in the current case assume?

A. It assumes that the inventory will have little value. For all units in his study with listed inventory, the overall average salvage value is only 14% of the inventory cost.[63] The amount of stranded inventory cost is highly speculative.

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[61] Order No. PSC-2021-0202A-AS-EI, page 150 (Docket No. 201990110-EI, Docket Nos. 20190110-EI, and 20210016-EI).
[62] Page 101, Exhibit No. JTK-2.
[63] Sum of the "Inventory Credit" amounts on pages 89-91 of Exhibit JTK-2, which is $12,173,000, divided by the sum of the Inventory Costs, which is $86,915,000 = 14%.

Q. Please summarize this issue.

A. 1. We have demonstrated that DEF is continuously over collecting from ratepayers for dismantlement costs. Adjustments are needed.

2. Proper cost-based rates cannot be based on speculative assumptions that DEF will maintain a normal inventory even as the plant approaches final retirement and that the inventory will have almost no value.

For these reasons, I have not included in my dismantlement cost estimates the speculative assumption that there will be large stranded inventory costs.

XV. The Assumed Hines Cooling Pond Dismantlement.

Q. What production unit has the highest claimed net dismantlement cost in Mr. Kopp's dismantlement estimates?

A. Hines Unit 4 has by far the highest claimed dismantlement cost. It has a claimed retail annual cost of $6,564,409. This is almost twice the claimed dismantlement cost for the second highest unit.[64] This one unit is approximately 20% of the total $33,977,969 annual retail cost shown for all units.[65]

[64] The second highest unit shows a cost of $3,674,259. Exhibit No. JTK-2, page 7, Retail column.
[65] Exhibit No. JTK-2, page 7, Retail column.

Q. In this case, is the claimed dismantlement cost for Hines Unit 4 drastically higher than it was in the prior case?

A. Yes. Page 78 of Mr. Kopp's Exhibit JTK-2 shows that in 2022 dollars the dismantlement cost of Hines Unit 4, including common, was $18,511,599. But in this case in 2025 dollars it is $109,863,967, which is six times as much as it was in the prior case.

Q. What is the major reason the claimed dismantlement cost has increased so much between the last case and this case?

A. The major reason is, unlike the prior study, in this case Mr. Kopp has added the assumption that the Hines Cooling Pond will be dismantled in 2047,[66] and there will be over $76,000,000 in dismantlement costs (in today's dollars) for dismantling the cooling pond.[67]

Q. Is it certain that DEF will have no need for a cooling facility at the Hines generating station after Unit 4 retires in 2047?

A. No. A cooling facility is required for any new production unit that uses steam. Any combined cycle production unit, including a hydrogen fired unit, will require a cooling facility. Small, next-generation nuclear units are in development, and such a unit requires

[66] Exhibit No. JTK-2, page 22.

[67] Page 136 of Exhibit No. JTK-2, Pond Closure $60,952,000 + 20% Contingency [$12,190,400] + 5% Indirect [$3,047,600] = $76,190,000.

a cooling facility. The assumption that no cooling facility will be needed any time after 2047 is just an assumption, and a very costly assumption.

Q. How much are the annual costs to maintain and repair the Hines Cooling Pond?

A. The DEF response to discovery shows that the annual costs to maintain and repair the Hines Cooling Pond.[68]

*** BEGIN CONFIDENTIAL PER DEF DESIGNATION***

[redacted]

*** END CONFIDENTIAL PER DEF DESIGNATION***

The assumption used in the prior (2020) DEF dismantlement study, which is that DEF will **__not__** dismantle the cooling pond when Hines Unit 4 retires,[69] should continue to be used.

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[68] DEF response to OPC's Tenth Set of Interrogatories, No. 257.
[69] See page 162 (also called Exhibit 6, page 117 of 142) of Order No. PSC-2021-0202A-AS-EI, (Docket Nos. 201990110-EI, 20190110-EI, and 20210016-EI).

XVI. Anclote Retirement Date in Dismantlement

Q. As discussed elsewhere in this testimony, DEF has agreed that 2042 is an appropriate expected retirement date for the Anclote production units.[70] Have you adjusted the dismantlement costs for that revised estimated retirement date?

A. Yes. I used 2042 as the expected retirement date in my dismantlement calculations.

XVII. Conclusion on Dismantlement Cost Estimates.

Q. What dismantlement cost estimates do you recommend?

A. For the reasons discussed above, I recommend the dismantlement cost estimates shown on Exhibit WWD-11. The total Retail Annual Accrual for Dismantlement is $9,792,545.[71]

XVIII. Approximately Half of Families Have A Cost Of Money Over 20% A Year

Q. Is setting depreciation rates or dismantlement costs higher than appropriate, a valid low-cost way to collect money, which DEF can use for other purposes, such as funding construction projects?

A. No. Collecting extra money from the ratepayers is not low-cost for the ratepayers. We can prove that the incremental cost of money is over 20% for almost half of all families.

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[70] DEF response to OPC's Sixth Set of Interrogatories, No. 139.

[71] It should be noted these numbers are the "net" dismantlement cost that is in excess of the many millions of dollars of salvage.

The Federal Reserve Bulletin shows that 45.4 percent of families carry a credit card balance.[72] According to the Federal Reserve, the average interest charged on credit card balances is 20.40 percent.[73] Every extra dollar that is taken from these families because of depreciation rates being higher than they should be, is one less dollar they could have used to pay down their credit card balance, which is costing them over 20 percent per year in interest.

Stated another way, for almost one-half of all families, their marginal cost of money is over 20 percent per year.

XIX. Recommendation

Q. What depreciation rates do you recommend?

A. For the reasons stated in this testimony, I recommend the depreciation rates in the OPC columns of Exhibit WWD-7.

Q. What dismantlement cost estimates do you recommend?

A. For the reasons discussed above, I recommend the dismantlement cost estimates shown on Exhibit WWD-11. The total Retail Annual Accrual for Dismantlement is $9,792,545.[74]

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[72] *Changes in U.S. Family Finances from 2016 to 2019: Evidence from the Survey of Consumer Finances*, Federal Reserve Bulletin Vol. 3, No. 3 (Sept. 2017) at page 23. This is attached as Exhibit WWD-12.
[73] January 2023 *Federal Reserve Statistical Release* (showing data from November 2022). Credit Cards, Accounts Assessed Interest. This attached as Exhibit WWD-13.
[74] It should be noted these numbers are the "net" dismantlement cost that is in excess of the many millions of dollars of salvage.

Q. Does this complete your prefiled direct testimony?

A. Yes, at this time. However, the compressed procedural schedule in this proceeding for filing Intervenor testimony has limited the time to complete OPC's investigation into the issues and effects of those issues on the Company's petition. Consequently, it is my understanding that OPC reserves the right to file supplemental testimony to fully address these issues and effects of those issues, if necessary.

C24-2007

(Transcript continues in sequence in Volume 5.)

CERTIFICATE OF REPORTER

STATE OF FLORIDA)
COUNTY OF LEON)

I, DEBRA KRICK, Court Reporter, do hereby certify that the foregoing proceeding was heard at the time and place herein stated.

IT IS FURTHER CERTIFIED that I stenographically reported the said proceedings; that the same has been transcribed under my direct supervision; and that this transcript constitutes a true transcription of my notes of said proceedings.

I FURTHER CERTIFY that I am not a relative, employee, attorney or counsel of any of the parties, nor am I a relative or employee of any of the parties' attorney or counsel connected with the action, nor am I financially interested in the action.

DATED this 4th day of September, 2024.

Debbie R. Krick

DEBRA R. KRICK
NOTARY PUBLIC
COMMISSION #HH575054
EXPIRES AUGUST 13, 2028