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April 12, 2019

BY ELECTRONIC FILING

Adam Teitzman, Director and Commission Clerk
Office of Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850

Re: In re: Commission Review of Numeric Conservation Goals (Orlando Utilities Commission, Docket No. 20190019-EG

Dear Mr. Teitzman:

Attached for filing on behalf of the Orlando Utilities Commission (OUC) are the following documents:

OUC's Petition for Approval of Numeric Conservation Goals;

Pre-filed Direct Testimony of Kevin M. Noonan, with attached Exhibits KMN-1 through KMN-3; and

Pre-filed Direct Testimony of Bradley E. Kushner, with attached Exhibits BEK-1 through BEK-3.

The foregoing documents have been furnished to the persons on the attached certificate of service by electronic mail.

Please acknowledge receipt and filing of the above documents. If you have any questions or need any further information regarding this filing, please call or email me any time. And as always, thank you and your professional staff for your excellent service.

Cordially yours,

Robert Scheffel Wright

Attachments

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the foregoing has been furnished by electronic mail this 12th day of April, 2019, to the following parties.

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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In Re: Commission Review of Numeric Conservation Goals (Orlando Utilities Commission)	DOCKET NO. 20190019-EG FILED: April 12, 2019

PETITION OF ORLANDO UTILITIES COMMISSION FOR APPROVAL OF ENERGY CONSERVATION GOALS PURSUANT TO THE FLORIDA ENERGY EFFICIENCY AND CONSERVATION ACT, SECTION 366.82, FLORIDA STATUTES

Petitioner, Orlando Utilities Commission ("OUC"), by and through its undersigned counsel and pursuant to Chapter 120, Florida Statutes,[1] Section 366.82, Florida Statutes, Rule 28-106.201, Florida Administrative Code ("F.A.C."), and Rule 25-17.0021, F.A.C., hereby petitions the Florida Public Service Commission ("PSC") to establish numeric conservation goals for OUC pursuant to the above-cited statutes and the Commission's Order Establishing Procedure ("OEP") for this docket, Order No. PS-2019-0062-PCO-EG. In summary, OUC is one of the seven Florida electric utilities specifically subject to the PSC's jurisdiction for setting conservation goals and is the named utility party to this docket. OUC has a longstanding, demonstrated track record of developing and implementing energy conservation and renewable energy measures and programs that are highly successful and that serve the State's energy efficiency and renewable energy policies set forth in the Florida Energy Efficiency and Conservation Act, Sections 366.80-.83 and 403.519, Florida Statutes ("FEECA"). Based on the evidence presented in the testimony and exhibits of witnesses testifying on behalf of OUC, filed contemporaneously

[1] All references herein to the Florida Statutes are to the 2018 edition.

herewith, OUC respectfully petitions the PSC to set goals for energy efficiency, peak demand reductions, and demand-side renewable energy measures of zero for OUC for the period 2020-2029, because the evidence presented will show that there are no meaningful energy conservation and peak demand reduction savings available from such measures that are of benefit to OUC's general body of ratepayers, and that the best interests of OUC's customers and the public interest generally will be best served by allowing OUC to develop and implement such measures, programs, initiatives, and projects based on the unique characteristics and needs of OUC's customer base.

In further support of this Petition, OUC states as follows:

PROCEDURAL BACKGROUND

1. The name, address, and contact information of the Petitioner are:

Orlando Utilities Commission
Reliable Plaza at 100 West Anderson Street
Post Office Box 3193
Orlando, Florida 32802.

2. All pleadings, order, notices, correspondence, and other materials should be directed to OUC's representatives as follows:

Robert Scheffel Wright
John T. LaVia, III
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Tallahassee, Florida 32308
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with a courtesy copy to:

W. Christopher Browder, Vice President & General Counsel
Office of General Counsel
Orlando Utilities Commission
Reliable Plaza at 100 West Anderson Street
Post Office Box 3193
Orlando, Florida 32802
Telephone (407) 434-2167
CBrowder@ouc.com.

3. The agency affected by this Petition is:

Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850.

4. This docket is one of seven dockets (the "FEECA Goals Dockets")[2] opened simultaneously by the PSC to fulfill its responsibilities pursuant to Section 366.82, Florida Statutes, to set goals ("FEECA Goals") for the utilities subject to FEECA (the "FEECA Utilities") at least every five years. These seven dockets have been consolidated for hearing purposes by the OEP. Since OUC has been a party to these quinquennial FEECA Goals Dockets and since OUC is a named party in this docket, OUC was fully aware of this docket and its purposes since before it was opened. This Petition does not seek to modify any PSC action, but rather respectfully asks the PSC to set goals that are consistent with FEECA, in the best interests of OUC's customers, and in the public interest.

LEGAL BACKGROUND

5. As noted above, this docket and the other FEECA Goals Dockets are convened by the PSC on a regular five-year cycle to consider and set goals, as appropriate, for the FEECA utilities "to increase the efficiency of energy consumption, increase the

[2] Docket No. 20190015-EG through Docket No. 20190021-EG, as set forth in the OEP.

development of demand-side renewable energy systems, reduce and control the growth rates of electric consumption and weather-sensitive peak demand, and encourage development of demand-side renewable energy resources." OEP at 1. The FEECA statute sets forth several factors that the PSC is to consider in establishing FEECA Goals, including utility load and usage data, the technical potential for achieving energy and demand reductions, the costs and benefits to customers who participate in each utility's programs, the costs and benefits to the utility's general body of ratepayers, the need for incentives, costs for compliance with state and federal regulations on the emissions of greenhouse gases. In addition, the PSC is authorized to consider other factors in establishing goals. Fla. Stat. § 366.82.

FACTUAL BACKGROUND

6. OUC is an electric utility within the meaning of Section 366.02(2), Florida Statutes, and is subject to FEECA.

7. OUC's retail electric service area covers approximately 248 square miles and includes the City of Orlando, portions of unincorporated Orange County, and portions of Osceola County. In addition, OUC and the City of St. Cloud ("St. Cloud") have an interlocal agreement under Chapter 163, Florida Statutes (the "Interlocal Agreement"), pursuant to which OUC serves the entire electric service requirements of St. Cloud and operates its electric generation, transmission and distribution systems. While St. Cloud is a legally separate municipal electric utility, consistent with OUC's obligations pursuant to the Interlocal Agreement, OUC treats the St. Cloud load and customers as part of OUC's retail obligations for planning and energy conservation purposes.

8. OUC currently serves approximately 242,000 electric customer accounts, including approximately 211,000 electric residential customers, 25,000 electric commercial customers, 5,700 electric industrial customers, a small number of customers to whom OUC provides street and highway lighting service, and a similarly small number of other public authorities to which OUC provides service. More than 50 percent of OUC's residential customers (including those in St. Cloud) live in multi-family residences, and many of these are rental units. Additionally, a significant number of single-family residences served by OUC are renter-occupied. Approximately 40 percent of OUC's residential customers have household incomes less than $35,000, which is approximately 1.4 times the Federal Poverty Level for a family of four.

9. OUC currently offers a number of programs that promote energy conservation and peak demand reduction. OUC also has in place several solar energy initiatives, including both demand-side and supply-side solar power projects, and OUC also obtains renewable electricity generated using landfill gas. Detailed information regarding OUC's conservation and renewable energy programs is included in the testimony of Kevin M. Noonan, filed contemporaneously with this Petition.

STATEMENT OF SUBSTANTIAL INTERESTS AFFECTED

10. In this docket, the PSC will establish FEECA Goals for OUC. The level of any mandatory goals will directly impact OUC's costs – both program costs incurred and potential avoided cost savings from such programs – and thus the rates paid by its customers. To the extent that mandatory goals would require OUC to implement measures and programs that are not cost-effective to the general body of OUC's ratepayers, i.e., if

such measures and programs do not pass the Rate Impact Measure ("RIM") test, the goals would result in greater costs being borne by OUC than the benefits realized from such measures and programs, and this would correspondingly result in OUC's general body of customers paying more for their electric service than in the absence of such goals. By this Petition, OUC seeks to protect its substantial interests in being able to provide reliable electric service at the lowest reasonable cost to its customers.

DISPUTED ISSUES OF MATERIAL FACT

11. The issues to be decided in this docket and the other FEECA Goals Dockets are set forth in the OEP and listed below.

ISSUE 1: Are OUC's proposed goals based on an adequate assessment of the full technical potential of all available demand-side and supply-side conservation and efficiency measures, including demand-side renewable energy systems, pursuant to Section 366.82(3), F.S.?

ISSUE 2: Do OUC's proposed goals adequately reflect the costs and benefits to customers participating in the measure, pursuant to Section 366.82(3)(a), F.S.?

ISSUE 3: Do OUC's proposed goals adequately reflect the costs and benefits to the general body of ratepayers as a whole, including utility incentives and participant contributions, pursuant to Section 366.82(3)(b), F.S.?

ISSUE 4: Do OUC's proposed goals adequately reflect the need for incentives to promote both customer-owned and utility-owned energy efficiency and demand-side renewable energy systems, pursuant to Section 366.82(3)(c), F.S.?

ISSUE 5: Do OUC's proposed goals adequately reflect the costs imposed by state and federal regulations on the emission of greenhouse gases, pursuant to Section 366.82(3)(d), F.S.?

ISSUE 6: What cost-effectiveness test or tests should the Commission use to set goals, pursuant to Section 366.82, F.S.?

ISSUE 7: Do OUC's proposed goals appropriately reflect consideration of free riders?

ISSUE 8: What residential summer and winter megawatt (MW) and annual Gigawatt-hour (GWh) goals should be established for OUC for the period 2020-2029?

ISSUE 9: What commercial/industrial summer and winter megawatt (MW) and annual Gigawatt hour (GWh) goals should be established for OUC for the period 2020-2029?

ISSUE 10: What goals, if any, should be established for OUC for increasing the development of demand-side renewable energy systems, pursuant to Section 366.82(2), F.S.?

12. From past experience, OUC anticipates that most or all of these issues will be disputed as between the FEECA Utilities and at least some intervenor parties. OUC reserves its rights to raise additional issues in compliance with the OEP.

STATEMENT OF ULTIMATE FACTS ALLEGED

13. OUC asserts that the following ultimate facts, fully supported by the competent and substantial testimony and exhibits of its witnesses, Bradley E. Kushner, Kevin M. Noonan, and Jim Herndon, support its request that the PSC establish zero goals for OUC for energy efficiency savings, peak demand reductions, and demand-side renewable energy measures.

A. The results of the Achievable Potential analyses performed by Nexant show that there are no measures for energy efficiency (EE), demand reduction (DR), or demand-side renewable energy for the Residential sector of OUC's customer base that pass the RIM test, which tests whether the utility's general body of ratepayers, i.e., those who do not participate in a DSM program, will see higher rates and bills if a given conservation measure is implemented.

B. The results of Nexant's Achievable Potential analyses conclude that there is one EE program for OUC's Non-Residential (commercial/industrial) sector (a commercial/industrial exterior lighting measures) that passes the RIM test, but that program would save only about 600 kilowatt-hours per year over the 2020-2029 period, which is less than a single residential customer uses in a month.

C. Nexant's Achievable Potential analyses conclude that there is no Achievable Potential for demand reduction savings for OUC.

D. Nexant's Achievable Potential analyses similarly conclude that there are no Achievable Potential savings available for OUC from demand-side renewable energy measures.

E. The foregoing facts, namely that there is no cost-effective Achievable Potential for demand reduction, energy efficiency savings, or demand-side renewable energy measures for OUC, demonstrate that OUC's goals should be set at zero for the period 2020 through 2029.

F. OUC has consistently exceeded its FEECA Goals with measures developed on OUC's initiative.

G. OUC will continue to develop and implement energy conservation, demand reduction, and demand-side renewable measures, as well as supply-side solar and other renewable energy initiatives, based on OUC's unique characteristics, OUC's knowledge of its system and customer base, and changing circumstances in the energy sector.

H. Allowing OUC to pursue this course, as it has successfully done for years, will serve the State's policies set forth in FEECA and meet the needs and circumstances of OUC's customers better and more effectively than if OUC were required to comply with mandatory goals

STATUTES AND RULES THAT ENTITLE OUC TO THE RELIEF REQUESTED

14. The statutes that entitle OUC to the relief requested include Sections 120.569 & 120.57, Florida Statutes, and FEECA, specifically Section 366.82, Florida Statutes.

CONCLUSION AND RELIEF REQUESTED

15. As explained above and in the testimony and exhibits of OUC's witnesses, there are no Achievable Potential savings available from energy conservation, demand reduction, or demand-side renewable energy measures for OUC, and accordingly, the PSC should set goals of zero for OUC. Nonetheless, based on OUC's longstanding track record

of developing and implementing conservation and renewable energy measures on its own initiative, the PSC can be assured – by the facts – that OUC will continue to pursue beneficial conservation and renewable energy measures in the best interests of its customers, consistent with the State's policies articulated in FEECA, and in the public interest of Florida as a whole.

WHEREFORE, Petitioner Orlando Utilities Commission respectfully asks the Florida Public Service Commission to establish goals of zero for OUC pursuant to FEECA, based on the evidence to be adduced in this proceedings.

Respectfully submitted this 12th day of April, 2019.

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IN RE: COMMISSION REVIEW OF NUMERIC CONSERVATION GOALS FOR ORLANDO UTILITIES COMMISSION, DOCKET NO. 20190019-EG

DIRECT TESTIMONY OF KEVIN M. NOONAN

ON BEHALF OF ORLANDO UTILITIES COMMISSION

I. INTRODUCTION AND QUALIFICATIONS

Q. Please state your name and business address.

A. My name is Kevin M. Noonan, and my business address is Orlando Utilities Commission, Reliable Plaza at 100 West Anderson, Orlando, Florida 32801.

Q. By whom are you employed, and in what position?

A. I am employed by the Orlando Utilities Commission ("OUC") as Director of Legislative Affairs.

Q. Please describe your duties and responsibilities in that position.

A. I am responsible for developing and implementing OUC's political engagement strategy with state and local elected officials, as well as other key government officials and policymakers. I work towards achieving passage of OUC sponsored legislation while also guiding and advising the organization on other proposed legislation and regulations that may impact OUC. I attend hearings, committee meetings, and council meetings and provide appropriate responses when necessary. I prepare proposed

legislative recommendations and advise on processes that may lead to policy development. I also prepare summary papers to advise OUC leadership and internal stakeholders on key legislative and regulatory matters for state and local activities.

Q. Please describe your educational background and professional experience.

A. I received a Bachelor of Science degree in Economics from Florida State University, a Master of Science in Urban and Regional Planning from Florida State University, and a Certificate in Management from Rollins College. I am a government relations, metering, sustainability and customer service professional with more than 24 years of experience in developing innovative government outreach and customer focused programs. In my career with OUC, my work on customer service and sustainability has included more than four years (2009-2013) of service as OUC's Director of Conservation & Renewables. In this role, I developed and implemented all of OUC's new customer conservation and education programs, including electric demand-side management and energy conservation efforts. My work included managing customer rebates and efficiency incentives for residential and commercial customers, including solar thermal and solar photovoltaic ("PV") rebate programs, as well as coordinating with other OUC departments on large-scale renewable energy projects.

Q. Are you testifying as an expert in this proceeding? If so, please state the area or areas of your expertise relevant to your testimony.

A. I am testifying both as to factual information regarding OUC and also as an expert on energy conservation policy issues, including OUC's proposals that the Florida Public Service Commission ("PSC") not establish any separate goals for OUC in these proceedings for energy conservation, peak demand reduction, or demand-side renewable energy development, because any such goals would not be cost-effective for OUC's general body of ratepayers. In addition, any such mandatory goals are unnecessary for OUC to continue its long-standing practices of implementing highly successful and beneficial energy conservation and renewable energy initiatives for the benefit of its customers and Florida as a whole.

Q. Are you sponsoring any exhibits to your testimony?

A. Yes. I am sponsoring the following exhibits:

Exhibit No. ___ [KMN-1] Resumé of Kevin M. Noonan;

Exhibit No. ___ [KMN-2] Description of OUC's Existing DSM Programs that Contribute Towards Meeting OUC's Current FEECA Goals; and

Exhibit No. ___ [KMN-3] Estimated Bill Impact for 1,000 kWh per Month Residential Customer.

II. PURPOSE AND SUMMARY OF TESTIMONY

Q. What is the purpose of your testimony in these proceedings?

A. I am testifying on behalf of OUC in Florida Public Service Commission ("PSC") Docket No. 20190019-EG, which is titled In re: Commission Review of Numeric Conservation Goals for Orlando Utilities Commission. This docket is one of seven essentially identical dockets, consolidated for hearing and administrative purposes, in which the PSC will establish goals for OUC and six other electric utilities that are subject to the Florida Energy Efficiency and Conservation Act ("FEECA") for the goal-setting period 2020 through 2029. These will include goals ("FEECA Goals") for improving energy efficiency, controlling and reducing the growth of electric energy consumption, reducing the growth of weather-sensitive peak electricity demands, and encouraging the development of demand-side renewable energy resources. The other utilities subject to FEECA are Duke Energy Florida ("DEF"), Florida Power & Light Company ("FPL"), Florida Public Utilities Company ("FPUC"), Gulf Power Company ("Gulf"), JEA (formerly named Jacksonville Electric Authority), and Tampa Electric Company ("Tampa Electric" or "TECO"), and I refer to this group, including OUC, as the "FEECA Utilities" in my testimony.

My testimony describes OUC, our service area and unique customer base, our existing generation, transmission, and distribution facilities, and our load

and usage characteristics. My testimony also summarizes the history and current status of OUC's highly successful energy conservation programs, including the processes that OUC follows in developing these measures and programs. My testimony provides an overview of the processes by which potential energy conservation, peak demand reduction, and demand-side renewable energy measures (collectively referred to as "DSM measures" or "DSM programs" herein) were evaluated by Nexant, Inc. ("Nexant"), for potential implementation and setting goals for OUC. Nexant is the consulting firm engaged by the FEECA Utilities to prepare studies of the Technical Potential, Economic Potential, and Achievable Potential energy conservation for these utilities; my testimony includes a summary of the information developed and furnished to Nexant by OUC and the respective roles of Nexant and OUC in the processes and analyses that support OUC's recommendations in this case.

Finally, my testimony presents OUC's specific recommendations regarding goals for energy conservation, demand reduction, and demand-side renewable energy development, including testimony addressing all of the specific issues identified by the PSC's Order Establishing Procedure for these proceedings.

Q. Please summarize the main conclusions of your testimony.

A. OUC continuously evaluates and implements DSM measures, including measures that reduce peak demands, reduce energy consumption, and encourage demand-side renewable energy measures. OUC's track record of DSM and renewable energy achievements is substantial and excellent. Even without specifically mandated goals, OUC will continue to develop and implement energy conservation programs and measures, and demand-side and supply-side renewable energy measures, based on the specific characteristics of OUC's system and customer base, in the best interests of OUC customers. These OUC efforts will, as they have for decades, result in significant energy conservation and renewable energy achievements for the benefit of our customers, the Greater Orlando community, and Florida as a whole.

For these FEECA Goals proceedings, OUC joined the other six FEECA Utilities in engaging Nexant to develop estimates of the Technical Potential, Economic Potential, and Achievable Potential for energy efficiency (conservation) savings, peak demand reductions, and demand-side renewable energy measures for OUC. The Technical Potential is a high-level estimate of the maximum possible amounts of demand reductions and energy savings that could be realized if every conceivable measure were implemented by every customer who could physically do so, without regard

to cost or any other real-world constraints. Economic Potential and Achievable Potential estimate what energy savings may be attained under more realistic economic assumptions. Nexant's analyses show that there is significant Technical Potential for summer and winter peak demand reduction (measured in megawatts, or "MW" and abbreviated as "DR") and energy reduction (measured in gigawatt-hours, or "GWH" and abbreviated as "EE," for Energy Efficiency) from DSM measures in OUC's service area.

Nexant analyzed Achievable Potential DSM savings for OUC using the Rate Impact Measure ("RIM") cost-effectiveness test, which tests whether the utility's general body of ratepayers, i.e., those who do not participate in a DSM program, will see higher rates and bills as a result of a given DSM measure or program, and the Total Resource Cost ("TRC") test. Because of OUC's focus on customer impacts, OUC strongly supports using the RIM test as the primary cost-effectiveness test for setting goals in these dockets.

Applying the RIM test, Nexant's analyses show that there are no DSM measures – no DR measures and no EE measures – for the Residential usage sector that are cost-effective to OUC"s general body of ratepayers. Nexant's Achievable Potential analyses also show that there are no DR measures for the Non-Residential usage sector (i.e., commercial and industrial customers) that offer Achievable Potential for energy or demand savings for OUC. The

sole Non-Residential sector EE measure that passes the RIM test would provide negligible EE savings: a ***total*** of ***6,000 kilowatt-hours*** over the ten-year goal-setting period, or about 600 ***kilowatt-hours*** per year from 2020 through 2029. This amount of savings is truly negligible: it is less than the amount of electricity used by a single residential customer in a month. Nexant's analyses of Achievable Potential savings from demand-side renewable energy measures, which included solar photovoltaic, battery storage, and combined heat and power ("CHP") measures, showed that none of those measures passed the RIM test.

Accordingly, I conclude that the PSC should set goals of zero for OUC through this proceeding. Even so, my testimony also demonstrates that the PSC can be fully assured that OUC will continue to offer various energy conservation and renewable energy initiatives for the benefit of our customers and for Florida as a whole.

III. OUC & OUR SYSTEM

Q. Please describe OUC and its governing structure.

A. OUC is governed by a five-member governing board, known as the OUC Commission. All members must be OUC customers, and at least one member must live outside the Orlando city limits. The Mayor of Orlando serves as an ex officio member of the OUC Commission; the other four

members may serve up to two four-year terms. All members of the OUC Commission serve without compensation.

The OUC Commission sets the rates and establishes the policies governing OUC's service and operations. OUC's board meetings are open to the general public and customers are permitted to participate in OUC Commission meetings in accordance with Chapter 286, Florida Statutes ("F.S.").

Q. Please describe OUC's service area and physical operations, including OUC's generation and other power supply resources, transmission system, and distribution facilities.

A. OUC's retail electric service area covers approximately 248 square miles and includes the City of Orlando, portions of unincorporated Orange County, and portions of Osceola County. In addition, OUC and the City of St. Cloud ("St. Cloud") have an interlocal agreement under Chapter 163, F. S. (the "Interlocal Agreement"), pursuant to which OUC serves the entire electric service requirements of St. Cloud and operates its electric generation, transmission and distribution systems. While St. Cloud is a legally separate municipal electric utility, consistent with our obligations pursuant to the Interlocal Agreement, OUC treats the St. Cloud load and customers as part of OUC's retail obligations for planning and energy conservation purposes.

OUC's generating facilities include owned interests totaling approximately 197 MW of simple cycle combustion turbine ("CT") and 476 MW of combined cycle ("CC") capacity fueled by natural gas, 775 MW of capacity fueled by coal, and 60 MW of nuclear generating capacity.

Additionally, OUC has a firm power purchase agreement ("PPA") for approximately 340 megawatts ("MW") of the Stanton A gas-fired combined cycle unit; this capacity is actually owned by Stanton Clean Energy, LLC. The contract runs through December 2031. OUC also has two contracts to purchase solar power from existing facilities at the Stanton Energy Center, one for 6 MW and one for 13 MW. In addition, OUC has contracts in place to purchase 18 MW of landfill gas capacity and utilizes additional landfill gas to offset coal generation from Stanton Energy Center Units 1 and 2.

OUC's transmission system includes 31 substations interconnected through approximately 335 miles of 230 kV, 115 kV, and 69 kV transmission lines. OUC has a total of 22 interconnections with FPL, DEF, KUA (Kissimmee Utility Authority), KUA/FMPA (Florida Municipal Power Agency), Lakeland Electric, Tampa Electric, and TECO/Reedy Creek Improvement District. Additionally, through the Interlocal Agreement, OUC is responsible for planning, operating and maintaining St. Cloud's four substations, 55 miles of transmission lines, and three interconnections.

OUC's distribution system includes approximately 2,055 circuit miles of distribution lines, excluding service laterals, and appurtenances including transformers, switchgear, capacitors, and protective devices to serve our customers.

Q. Please describe OUC's customer base and OUC's current load and usage characteristics.

A. OUC currently serves approximately 242,000 electric customer accounts, including approximately 211,000 electric residential customers, 25,000 electric commercial customers, 5,700 electric industrial customers, a small number of customers to whom OUC provides street and highway lighting service, and a similarly small number of other public authorities to which OUC provides service.

More than 50 percent of OUC's residential customers (including those in St. Cloud) live in multi-family residences, and most of these are rental units. Additionally, a significant number of single-family residences served by OUC are renter-occupied. Approximately 40 percent of OUC's residential customers have household incomes less than $35,000, which is approximately 1.4 times the Federal Poverty Level for a family of four. (For reference, households qualify for food stamps if their income are up to 2.0 times the Federal Poverty Level.) The fact that so many of OUC's residential

customers are low-income and renters presents special challenges to the effective implementation of DSM measures and programs for OUC, and particularly for this potential target population. Briefly, low-income customers simply do not have the discretionary income to pay the customer's cost to participate in a DSM program, and renters have little, if any, control over such expenditures and investments by their landlords. Even if renters have the discretionary income and the ability to make efficiency improvements, they have little incentive or opportunity to do so since they do not own the property. These factors significantly limit the potential for OUC to implement residential DSM measures and programs. Tenant-occupied commercial properties experience the same dilemma when it comes to investing in energy efficiency improvements to property they do not own.

The average usage per OUC residential customer is currently approximately 12,200 kilowatt-hours ("KWH") per year, or about 1,000 KWH per customer per month.

Q. Please describe OUC's current and projected retail and total peak demand and energy consumption.

A. OUC is a summer-peaking utility. OUC's 2018 system peak demand of 1,537 MW occurred in September 2018 and included St. Cloud as well as wholesale sales to Vero Beach, Winter Park, Lake Worth, Bartow, and FPL.

OUC's peak retail demand was approximately 1,330 MW. OUC's 2018 total retail sales (consisting of sales to residential, commercial, and industrial customers) were approximately 6,563 Gigawatt-hours ("GWH"), and our Net Energy for Load ("NEL") was approximately 7,998 GWH.

To provide a frame of reference for the goal-setting period through 2029, OUC's most current Ten-Year Site Plan ("TYSP") for 2019 shows that system peak demand, including wholesale supply obligations, is projected to increase from 1,537 MW in 2018 to approximately 1,596 MW in 2028. OUC currently projects that it will not have any long-term committed wholesale supply obligations in 2028. OUC's total system NEL is projected to increase from 7,998 GWH in 2018 to approximately 8,173 GWH in 2028. Our retail energy load over the same period is projected to increase from 6,563 GWH in 2018 to about 7,437 GWH in 2028. Our average usage per residential customer account is projected to decline over this period, from about 12,200 kWh per customer per year in 2018 to about 11,400 kWh per customer per year in 2028.

Q. Please provide a brief discussion of how the "Base Case" forecast of OUC's customers, winter and summer demands, and energy requirements (Net Energy for Load) was developed.

A. The basis for the projections of OUC's demand and energy requirements that Nexant used in its analyses were projections from OUC's 2017 Ten-Year Site Plan ("TYSP") and supporting information regarding number of customers and customer usage data. The 2017 TYSP data and information were used by the FEECA Utilities (except for FPUC, which does not file a TYSP) because these data were the best information, and the only comparable information, available when Nexant was engaged and began its analyses, which was in late 2017. OUC's demand and energy projections in its 2017 TYSP were (and still are) based on a set of sales, energy, and demand forecast models each year to support its budgeting and financial planning process as well as long-term planning requirements. In preparing the forecasts, OUC uses internal records, company knowledge of the service territory and customers, and economic projections. OUC draws on outside expertise and resources, including Itron (a nationally recognized utility load forecasting firm) and regularly meets with other utility load forecasting experts.

As explained in the testimony of Jim Herndon, Nexant used OUC's data in developing more detailed estimates of peak demands and energy usage for different segments of the Residential and Non-Residential customer sectors, and then aggregated those to develop projected system peak demands and energy loads, which were then used in analyzing Technical Potential. For

OUC, Nexant used data for the Residential, General Service, and General Service-Demand rate classes.

IV. OUC'S DSM PROGRAMS AND RENEWABLE ENERGY ACHIEVEMENTS

Q, Please describe and discuss OUC's current DSM programs, including information regarding current and historical customer participation rates and cumulative energy (GWH or MWH) and peak demand (kW or MW) savings.

A. OUC currently offers the following programs that contribute towards meeting OUC's current FEECA goals.

Residential Duct Repair/Replacement Rebate Program

Residential Ceiling Insulation Upgrade Rebate Program

Residential Window Film/Solar Screen Rebate Program

Residential ENERGY STAR® Windows Rebate Program

Residential Efficient Electric Heat Pump Rebate Program

Residential New Home Rebate Program

Residential Efficiency Delivered Program

Commercial Efficient Electric Heat Pump Rebate Program

Commercial Duct Repair/Replacement Rebate Program

Commercial Window Film/Solar Screen Rebate Program

Commercial Ceiling Insulation Upgrade Rebate Program

Commercial Cool/Reflective Roof Rebate Program

Custom Incentive Rebate Program

Indoor Lighting Billed Solution

LED Street Lighting Upgrade

Exhibit No. ___ [KMN-2] provides a description of each of these programs, as well as calendar year 2018 and cumulative participation rates and cumulative energy and peak demand savings for each program since the current FEECA goals were established (i.e. 2015 through 2018).

Q. Please discuss how OUC's current and potential future DSM programs are affected by building code requirements, e.g., the Florida Building Code, as it relates to energy efficiency requirements for residential and other buildings.

A. In general, more stringent building code requirements result in more efficient buildings, thereby reducing the potential for cost-effective DSM programs as there is less opportunity to incentivize or achieve demand and energy reductions.

Q. Please discuss how OUC's current and potential future DSM programs are affected by changes in appliance efficiency standards.

A. In general, increased appliance efficiency standards reduce the potential for cost-effective DSM programs because as federal appliance standards

increase and appliances become more efficient, there is less opportunity to incentivize or achieve demand and energy reductions. For example, if air conditioners were subjected to more stringent efficiency standards, e.g., a seasonal energy efficiency ratio ("SEER") of 15.0, then no utility would be able to justify a DSM program that provided a rebate for any unit with a SEER below 15.0, even though the utility might previously have been offering rebates for units with a SEER of 14.0.

Q. Please describe OUC's existing demand-side renewable energy programs.

A. OUC is actively working to provide opportunities for its customers to participate in solar projects and programs. These initiatives include Solar Photovoltaic (PV) Net Metering, the Solar Aggregation Program (referred to as the OUCollective Solar Program), and the Solar Thermal Program. Customers who participate in the Solar PV Program or the OUCollective Solar Program receive the benefit of net metering, which provides the customers with a monthly credit on their utility bills for energy produced in excess of what the home or business can use. Any excess electricity generated and delivered by the solar PV systems back to OUC's electric grid is credited at the customer's full retail electric rate. Customers who take part in the OUCollective Solar Program are able to reduce installation costs by leveraging economies of scale to drive down the costs for PV systems. Under

the OUCollective Solar Program, customers have access to installations for a fixed (discounted) price that has been vetted by OUC, and from a contractor that has been vetted by OUC. Residential customers participating in the Solar Thermal Program receive a rebate of $900 for installing a solar hot water system. Federal incentives, such as the investment tax credit, are available to eligible customers to help minimize costs of solar PV and solar thermal systems. As of March 12, 2019, under the OUCollective Solar Program, 50 contracts have been signed, representing a total of approximately 655 kW.

Q. Please describe OUC's existing supply-side renewable energy programs, investments, and initiatives.

A. To further facilitate development of solar energy, OUC supported Orange County in its efforts to obtain a $2.5 million grant from the Florida Department of Environmental Protection to install a 1 MW solar array on the Orange County Convention Center. The project "went live" in May 2009 and is currently producing clean, green power. In 2008, Orlando was designated a "Solar American City" by the U.S. Department of Energy (DOE). The ongoing partnership between OUC, the City and Orange County received $450,000 in funding and technical expertise to help develop solar projects in OUC's service area that can be replicated across the country.

In 2009, OUC and clean energy company Petra Solar teamed up to launch the first utility pole-mounted solar PV system in Florida. Ten of Petra Solar's SunWave™ intelligent PV solar systems have been installed on OUC utility poles along Curry Ford Road. Together the panels can generate up to 2 kW, about enough to power a small home. The innovative solar panel demonstration project is expected to help enhance the smart grid capabilities and reliability of the electric distribution grid. Petra Solar worked in collaboration with the University of Central Florida in developing the pole-mounted approach to clean energy generation. The SunWave™ systems not only turn street light and utility poles into solar generators, but they also communicate with the electric grid and can offer smart grid capabilities. The systems can improve grid reliability through real-time communications between solar generators in the field and the utility control center. In addition, the systems enhance electric distribution grid reliability through a host of capabilities such as voltage and frequency monitoring and reactive power compensation.

During 2010, OUC invested $100,000 in an educational partnership with the Orlando Science Center to build a 31 kW PV array atop the Science Center's observatory. The system provides about 42,660 kilowatt-hours (kWh) of electricity per year, or enough power to serve about four homes. The PV installation not only provides green power to the Science Center but also an

educational experience on the science of solar energy for the thousands of children who visit the center each year.

OUC has added additional solar to its fleet of natural gas, coal, solar, and landfill gas generation already on-site at the Stanton Energy Center. The Stanton Solar Farm, constructed in partnership with Duke Energy, was brought online in late 2011 and produces about 6 MW – enough to power about 600 homes. The first Stanton Solar Farm consists of more than 25,000 modules featuring solar panels with a patented single-axis tracking system design that can withstand Category 4 hurricane winds while increasing electricity output by 30 percent. OUC purchases 100 percent of the output of this installation, which was the first solar farm in Orange County, for 20 years.

In 2013, OUC built the first Community Solar Farm in Central Florida. This innovative project allowed customers to "buy a piece of the sun" and receive the benefits of solar without having to install it on their own buildings. The 400 kW system sold out in six days and had a total of 39 customers sign up. The American Public Power Association ("APPA") awarded OUC the 2015 Energy Innovator award on June 9, 2015, for its groundbreaking Community Solar Farm program.

In 2015, OUC signed a 20-year PPA for approximately 9 MWac of solar energy from a second solar farm at the Stanton Energy Center. Brought on-line in 2017, the Kenneth P. Ksionek Solar Farm will provide enough electricity to power 2,100 homes. Only one other utility in the nation has placed panels over a coal ash byproduct landfill at a power plant. This solar farm is the latest addition to OUC's Community Solar program.

OUC has committed to be the largest participant in the Florida Municipal Solar Project, one of the largest municipal-backed solar projects in the United States. Approximately 900,000 solar panels will be installed on three solar sites expected to be built in Osceola and Orange Counties. Total electricity output will be 223.5 MW, which is enough energy to power 45,000 average Florida homes. Each solar site is designed to generate 74.5 MW of energy. OUC will be purchasing 108.5 MW of solar capacity from the project through Power Purchase Agreements.

In February 2017, OUC installed an innovative floating solar array on a water retention pond at its Gardenia Operations Center. The 31.5 kW pilot project is the first in Florida to send power directly to the grid. Comprised of 100 panels mounted on floats it produces enough energy to power five homes. This design appeals to developers who want to invest in solar but do not want to cut down trees or use valuable land resources. Also, OUC is evaluating

performance gains in energy production as a result of the increased reflectance and cooling effect of the water. More than 9,000 potential sites within Orange and Osceola counties have been identified where floating solar may be a viable option.

In August of 2018, OUC completed the addition of a new solar test site at its Pershing Operations Center. This test site will allow OUC to study and test a variety of solar panels and tilt angles. OUC will also collect weather data from the site to compare with the solar production data. These studies will allow for OUC to determine how to make future solar installations the most efficient. The peak capacity for this test array will be approximately 24 kW depending on the number of solar panels that are being tested at any given time. All of the electricity produced by the array will be supplied back to the grid. In 2018, the test array produced 5,414 kWh.

OUC is further showcasing solar energy by installing high-visibility solar sculptures (or "solar trees"), like the structures seen at Camping World Stadium and the Orange County Convention Center. OUC has also invested in solar on utility poles and has been an area leader in installing utility-scale projects atop the Orange County Convention Center and the Stanton Energy Center. Additionally, OUC has deployed multiple solar mobile device

charging stations at LYNX bus shelters to power up electronic devices while passengers are waiting.

V. ANALYSES OF OUC'S DSM POTENTIAL

Q. Please summarize how the Technical Potential, Economic Potential, and Achievable Potential for energy conservation and demand reductions for OUC were developed.

A. OUC joined with the other six FEECA Utilities to engage Nexant to prepare analyses of the Technical Potential for DSM achievements for all seven FEECA Utilities. Additionally, OUC engaged Nexant to perform the Economic Potential screening and Achievable Potential analysis for OUC. The Technical Potential analyses estimate the maximum amount of energy savings and peak demand reductions that could be achieved if every customer technically capable of implementing a measure were to do so, regardless of cost, customer acceptance, or any other constraints or considerations, including availability and cost-effectiveness to either the customer or the utility. The Economic Potential analysis is a screening step in the overall analytical process in which each potential measure is evaluated using the RIM cost-effectiveness test and the TRC cost-effectiveness test to determine whether it would be appropriate to consider potential savings from each measure as part of a utility's achievable DSM potential. The RIM test measures the benefits of a measure to a utility's customers who do not

participate in the measure; if a measure has a RIM benefit-to-cost ratio greater than 1.0, then that measure has net positive benefits to the utility's non-participating customers. The TRC test measures the net costs of a DSM program as a resource option, including both participant costs and utility costs and real resource cost savings, but without customer bill savings or incentive payments. If a measure has a TRC benefit-to-cost ratio greater than 1.0, then that measure is deemed to have net positive benefits. More detail regarding Nexant's analyses is provided in the testimony of Jim Herndon.

Further analyses and considerations, including customer acceptance, customer payback, general market availability of equipment and vendors to install it, and other factors are applied to determine a utility's Achievable DSM Potential. The utility's actual goals are ultimately determined by considering Achievable Potential in light of other resource options and practical considerations.

Q. What were OUC's and Nexant's respective roles in preparing the Technical, Economic, and Achievable Potential analyses of DSM measures for OUC?

A. For these analyses, OUC prepared and provided to Nexant OUC-specific input data needed for these analyses. Nexant also developed a great deal of input data and program information as part of its engagement with the

FEECA Utilities, and Nexant was responsible for preparing the Technical Potential, Economic Potential, and Achievable Potential analyses and corresponding results for DSM measures for OUC.

Q. Are the data and information prepared by OUC and used by Nexant appropriate and reliable?

A. Yes. The information prepared by OUC and furnished to Nexant is the same reliable information that OUC uses in making its system planning decisions and in preparing its annual Ten-Year Site Plans and other reports to the PSC.

Q. In developing its estimates of Technical Potential, Economic Potential, and Achievable Potential, how did Nexant and OUC address and consider the "free riders" issue, i.e., the fact that some customers would implement a given energy conservation measure even if there were no economic incentive offered for them to do so?

A. OUC and Nexant followed the analytical framework previously approved by the PSC and evaluated free ridership in three scenarios: a "base case" scenario in which the maximum allowable incentive was determined as the amount necessary to make the measure cost-effective to a participating customer based on a two-year payback to the customer, including the incentive; a shorter free rider exclusion period of one year; and a longer free rider exclusion period of three years.

Q. How were the costs and benefits to customers who do not participate in a program – i.e., "non-participating customers" or the "general body of ratepayers" developed and estimated?

A. Nexant developed the cost and benefit values used in the RIM analyses, which evaluates cost-effectiveness to the utility's general body of ratepayers, including the avoided cost, fuel price, rate, carbon regulation, and administrative costs furnished by OUC, and also using the costs of implementing measures developed and calculated by Nexant.

Q. How did Nexant analyze the impacts of free riders on the cost-effectiveness of DSM measures?

A. Nexant prepared its base case cost-effectiveness analyses using a two-year free-ridership screen, which reasonably assumes that a customer who would experience positive net benefits from a self-financed measure with a simple payback of two years or less would implement the program anyway, i.e., without any utility-provided incentive. Nexant also prepared free rider sensitivity analyses using a one-year free ridership screen and a three-year screen. Using the shorter screen results in incrementally more participation in utility-incentivized measures and thus more potential conservation, while the longer screen results in less. The base case two-year free ridership screen has been used by the PSC since 1994, and the one-year and three-year

sensitivity cases are the same as sensitivities considered in prior FEECA Goals dockets, including those in the most recent 2013-2014 cycle.

Q. Do you agree that Nexant's Technical Potential analysis for OUC accurately represents the population of available DSM measures and the technically possible energy savings and peak demand reductions available from the measures analyzed?

A. With the qualifications that I did not perform these studies and that I did not review every component calculation of Nexant's analyses, I would say that Nexant's analyses cover the waterfront of available DSM measures, and that Nexant's estimates of technically possible energy savings and demand reductions from such measures make sense to me based on my general knowledge of DSM measures and OUC's system.

VI. OUC'S PROPOSED FEECA GOALS

Q. Once Nexant calculated the Achievable Potential energy efficiency and peak demand reduction amounts for OUC, what did OUC do with that information?

A. Nexant calculated the Achievable Potential energy efficiency, peak demand reduction, and demand-side renewable amounts for OUC using both the RIM and TRC cost-effectiveness metrics. The next step in developing any goals is for the utility to consider these results and develop its own goals, and where

appropriate FEECA Goals, for such measures based on the utility's unique circumstances.

Q. What did OUC conclude with respect to proposed FEECA Goals for OUC?

A. Based on Nexant's results and our knowledge of OUC's unique customer base and specific circumstances, OUC concluded that it would not be appropriate or in the best interests of OUC's general body of ratepayers to establish any energy efficiency, peak demand reduction, or demand-side renewable energy goals for OUC for the period 2020-2029. Therefore, OUC proposes that the PSC set goals of zero for OUC with respect to residential, commercial, and industrial energy efficiency and peak demand reduction measures, and for demand-side renewable energy systems, pursuant to FEECA. In reaching this decision, we considered the following:

1. None of the Residential sector DSM measures evaluated by Nexant pass the RIM test for summer or winter peak demand reductions or for EE savings for OUC.

2. Nexant found zero MW of commercial/industrial DR Achievable Potential for OUC.

3. The energy savings associated with the one RIM-cost-effective EE measure in the Non-Residential sector – an exterior lighting controls measure - are truly negligible: a total of roughly 6,000 kWh over the entire 2020

through 2029 FEECA goal-setting period, or an average of approximately 600 kWh per year, which is less electricity than a single residential customer uses in one month. These results indicate that OUC's general body of ratepayers would likely be worse off – required to pay more for the measures than the economic benefits realized – if goals were set based on any of those measures.

4. Nexant's analyses concluded that for OUC, there are no cost-effective Achievable Potential savings available from demand-side renewable measures, including solar PV, battery storage, and combined heat and power ("CHP") systems.

5. The negative RIM benefit-to-cost results for the vast majority of the 278 measures studied by Nexant have special weight for OUC's consideration of the welfare of our customers, because of the relatively high proportions of low-income households and renters whom we serve.

6. OUC has consistently pursued and implemented demand-side conservation and renewable energy measures that best meet the needs of our customers while fulfilling Florida's energy conservation policies. In fact, my Exhibit No. ___ [KMN-2] shows that OUC's DSM programs, carefully selected and implemented by OUC based on our unique circumstances, have consistently exceeded the FEECA Goals that the PSC established for OUC in the previous FEECA goal-setting docket.

7. Allowing OUC to continue to develop and implement energy conservation programs and measures, and demand-side and supply-side renewable energy measures, based on the specific characteristics of OUC's system and customer base, is in the best interests of OUC customers and will result in significant energy conservation and renewable energy achievements for the benefit of the Greater Orlando community and Florida as a whole.

Q. What are the estimated impacts on a typical residential customer's bill if OUC were to implement goals based on the Achievable Potential goals for OUC using the RIM test and the TRC test, respectively, for each year from 2020 through 2029?

A. If OUC were to implement goals based on the Achievable Potential measures and goals following the RIM test, there would be no residential bill impacts because the goals would be set at zero as requested by OUC. If OUC were to implement goals based on the small number of measures that pass the TRC test, for a typical 1,000 kWh per month residential customer, the estimated base rate impacts begin at 0.4 percent in 2020 and increase to a cumulative impact of 10.6 percent in 2029. Exhibit No. ___ [KMN-3] provides the estimated annual percentage increases in residential base rates for measures that pass the TRC and Participant tests.

Q. Should the PSC establish goals for OUC for summer and winter peak demand (MW) reductions by residential customers in this proceeding?

A. No. Since no residential peak demand reduction (DR) measures have positive RIM benefit-cost ratios, the PSC should not establish goals for OUC for residential summer or winter peak demand reductions. Stated differently, OUC's FEECA Goal for residential demand reductions should be zero.

Q. What goals for reducing energy consumption (GWH) through energy conservation measures by residential customers is OUC proposing in this proceeding?

A. Zero. Since no residential energy efficiency (EE) measures have positive RIM benefit-cost ratios, the PSC should not establish goals for OUC for residential energy efficiency savings.

Q. What goals for summer and winter peak demand (MW) reductions by commercial and industrial customers is OUC proposing in this proceeding?

A. Zero. Nexant found zero MW of commercial/industrial DR Achievable Potential for OUC. Therefore, the PSC should not establish goals for OUC for commercial/industrial summer or winter peak demand reductions.

Q. What goals for reducing energy consumption (GWH) through energy conservation measures by commercial and industrial customers is OUC proposing in this proceeding?

A. Zero. Although there is one commercial/industrial EE measure that has a positive RIM benefit-to-cost ratio, Nexant estimates that this measure – an exterior lighting controls measure – would provide truly negligible energy savings: a total of ***6,000 kilowatt-hours*** over the entire ten-year goal-setting period, or about 600 kWh per year, which is less than the amount of electricity used by a single residential customer in a month. Setting a goal other than zero based on this minuscule savings estimate would be inappropriate and unreasonable.

Q. What goals for encouraging the development of demand-side renewable energy systems is OUC proposing in this proceeding?

A. Zero. Nexant evaluated the Achievable Potential for demand-side renewable measures by evaluating solar PV, battery storage, and CHP measures. Since none of these measures showed positive RIM benefit-cost ratios, the PSC should not establish goals for OUC for demand-side renewable energy measures .

Supply-Side Efficiency and Conservation

Q. Please describe any supply-side energy conservation and efficiency measures or programs implemented by OUC.

A. OUC continually monitors the efficiency of its generation, transmission, and distribution systems, including both equipment and operations, and studies potential improvements in all three functions that show promise for cost-effectively improving the overall energy efficiency and cost-effectiveness of delivering power to OUC's customers. For example, OUC recently completed installation of variable frequency drives on Stanton Unit 2 to improve efficiency while operating at low load levels and is planning on similar upgrades to Stanton Unit 1 during 2020 as well as additional efficiency improvements for Stanton Unit 2 during 2019.

Q. How are these supply-side efficiency and conservation measures reflected or incorporated into OUC's planning processes?

A. OUC's planning processes utilize the most current data and information available from our operations in our planning processes. Thus, whenever a supply-side efficiency improvement or energy conservation measure is implemented, the efficiency gains of that program start showing up in the data that is used in succeeding planning cycles and analyses.

Q. How does the presence and implementation of these supply-side conservation and efficiency measures affect potential savings from energy conservation programs?

A. Any improvement in the efficiency of our power supply and energy delivery systems naturally and inherently reduces the amount and value of savings available from reducing peak demand or incremental energy use on OUC's system. For example, an improvement in power production efficiency, e.g., a lower heat rate at a generator, reduces the amount of fuel required to deliver any given amount of power to customers, which results in less avoided-cost value from any conservation measure. Similarly, any reduction in energy output, which might include lower heat rates in production or improved transformation efficiency (lower line losses) on the transmission and distribution systems, needed to deliver service will result in a reduction in our marginal energy costs to serve, which correspondingly reduces the value of avoiding any energy that might otherwise be demanded by customers.

Q. Is OUC proposing that the PSC set any goals for supply-side conservation and efficiency measures for OUC in this proceeding?

A. No. OUC naturally recognizes the potential benefits of supply-side energy conservation measures as well as the requirements and policies set forth in FEECA. For example, Section 366.82(2), F.S., encourages energy "efficiency investments across generation, transmission, and distribution as

well as efficiencies within the user base." Section 366.82(3), F.S., requires the PSC to evaluate the potential of "supply-side conservation and efficiency measures" in developing goals. OUC believes that any supply-side conservation and efficiency goals for OUC are unnecessary and potentially counter-productive. OUC continuously monitors the energy efficiency of all aspects of its supply-side functions, i.e., generation, transmission, and distribution, and implements cost-effective modifications and improvements as appropriate.

Demand-Side Renewable Energy Systems

Q. Is OUC proposing any goals pursuant to FEECA for the development and encouragement of demand-side renewable energy systems?

A. No. As is the case with the vast number of measures evaluated for possible energy efficiency and peak demand reductions, no demand-side renewable energy system measures passed the RIM test, and accordingly, OUC proposes that the PSC set no FEECA Goals, or goals of zero, for demand-side renewable system measures. However, this proposal is only with respect to the establishment of specific, mandatory FEECA Goals. As discussed earlier in my testimony, OUC strongly supports renewable energy, particularly both demand-side and supply-side solar energy systems, and OUC is in the process of expanding its already substantial initiatives using

both demand-side and supply-side solar, as well as using landfill gas to provide power for OUC's customers.

Q. Please discuss how OUC's proposed goals will encourage the development of demand-side renewable energy systems and resources.

A. Since OUC is proposing that its numeric FEECA Goals for peak demand reduction, energy reduction, and demand-side renewable energy systems be set at zero, the technical answer to this question is that OUC's proposed "zero goals" will not directly encourage the development of demand-side renewables on OUC's system.

However, as discussed earlier in my testimony, the relevant facts are that OUC has in place and will continue to provide significant opportunities for its customers to participate in solar projects and programs that are outside the scope of numeric FEECA Goals, and OUC also has in place and will continue to expand its extensive supply-side solar power initiatives.

Q. Are OUC's proposed goals based on an adequate assessment of the full technical potential of all available demand-side and supply-side conservation and efficiency measures, including demand-side renewable energy systems, pursuant to Section 366.82(3), F.S.?

A. Yes.

Q. Do OUC's proposed goals adequately reflect the costs and benefits to customers participating in the measure, pursuant to Section 366.82(3)(a), F.S.?

A. Yes. Nexant's Participant Test analysis adequately and reasonably reflect the costs and benefits to customers who might participate in the DSM measures and programs studied.

Q. Do OUC's proposed goals adequately reflect the costs and benefits to the general body of ratepayers as a whole, including utility incentives and participant contributions, pursuant to Section 366.82(3)(b), F.S.?

A. Yes. Nexant's Participant Test and Rate Impact Test analyses adequately and reasonably reflect the costs and benefits to the general body of ratepayers as a whole, including consideration of utility incentives and participant contributions.

Q. Do OUC's proposed goals adequately reflect the need for incentives to promote both customer-owned and utility-owned energy efficiency and demand-side renewable energy systems, pursuant to Section 366.82(3)(c), F.S.?

A. Yes. Nexant's analyses are based on reasonable and thorough analyses of incentives at different levels for the potential DSM measures studied.

Q. Do OUC's proposed goals adequately reflect the costs imposed by state and federal regulations on the emission of greenhouse gases ("GHG"), pursuant to Section 366.82(3)(d), F.S.?

A. Yes. There are no costs currently imposed on OUC or other Florida utilities by any state or federal carbon dioxide or GHG emissions regulations, and there is no state or federal requirement currently in place that establishes any such compliance costs with a known implementation date or magnitude. Recognizing and respecting the ongoing public concerns regarding climate change and the potential imposition of such GHG regulations, Nexant's RIM, TRC, and Participant test analyses for OUC are based on reasonable – and possibly conservatively high – estimates of the future costs of state and federal regulations applicable to GHG emissions. Even with these assumptions, Nexant's analyses conclude that (a) only one of the EE measures studied (a commercial/industrial exterior lighting measure) passes the RIM test, and that measure would provide negligible energy savings as discussed previously in my testimony; (b) there are no Achievable Potential savings available to OUC from DR measures; and (c) there are no cost-effective Achievable Potential savings for OUC from demand-side renewable energy systems, including solar PV, battery storage, and CHP systems.

Q. What cost-effectiveness test or tests should the PSC use to set goals for OUC, pursuant to Section 366.82, F.S.?

A. The PSC should base any goals that it establishes for OUC on the RIM test, indicating that any required measure must be cost-beneficial to OUC's general body of ratepayers, particularly since the PSC does not have rate setting jurisdiction over municipal utilities. The PSC should also consider the Participant test, such that any measure that passes RIM must also be cost-beneficial to a participating customer.

Q. Do OUC's proposed goals appropriately reflect consideration of free riders?

A. Yes. OUC's proposed zero goals appropriately reflect the fact that no DSM measures pass the RIM test when evaluated using the two-year free-ridership screen that the PSC has used since 1994. Moreover, Nexant's one-year free rider exclusion sensitivity analyses show that even with this more DSM-favorable assumption, there are no RIM-cost-effective summer or winter peak demand reductions and that the amount of EE savings is minimal – 10,000 kWh per year (a total of 100 MWh) over the ten-year goal-setting period from 2020 through 2029.

Q. What residential summer and winter megawatt (MW) and annual gigawatt-hour (GWh) goals should be established for OUC for the period 2020-2029?

A. Zero. The PSC should establish goals of zero for OUC for residential summer and winter MW and energy efficiency savings.

Q. What commercial/industrial summer and winter megawatt (MW) and annual gigawatt-hour ("GWh") goals should be established for OUC for the period 2020-2029?

A. Zero. The PSC should establish goals of zero for OUC for commercial/industrial summer and winter MW and energy efficiency savings.

Q. What goals, if any, should be established for OUC for increasing the development of demand-side renewable energy systems, pursuant to Section 366.82(2), F.S.?

A. The PSC should not set any goals for OUC to increase its development of demand-side renewable energy systems. None of the demand-side renewable energy measures evaluated by Nexant, including solar PV, battery storage, and CHP measures, passed the RIM test for OUC. As described above, OUC has already implemented and operates substantial demand-side renewable energy initiatives, including both solar PV and solar thermal water

heating measures, as well as substantial supply-side initiatives using solar and landfill gas renewable energy technologies.

VII. CONCLUSIONS

Q. Please summarize the main conclusions of your testimony.

A. OUC has a proven track record of implementing effective and successful DSM programs and both demand-side and supply-side solar power initiatives. OUC is in the best position to implement DSM, EE, and renewable energy measures that will best meet the needs of OUC's customers, the Orlando community, and the State as a whole, and accordingly, OUC's request that the PSC set zero FEECA Goals for OUC is well-founded in fact and is in the public interest.

OUC's request is bolstered by several conclusions of the Nexant Market Potential Study for OUC. First, Nexant's RIM test results show that no Residential sector measures pass the RIM test and that the single RIM-cost-effective EE measure identified for the Non-Residential (commercial/industrial) sector would provide at most negligible benefits. Nexant's analyses further conclude that there are no Achievable Potential savings available to OUC from DR measures, and that there are no cost-effective Achievable Potential savings for OUC from demand-side

renewable energy systems, including solar PV, battery storage, and CHP systems.

OUC's record of developing and implementing significant amounts of both demand-side and supply-side solar power initiatives is widely recognized and respected.

The PSC should set zero goals for OUC, and in so doing, the PSC can rest fully assured that OUC will continue to aggressively serve and promote the energy conservation and renewable energy goals and policies of FEECA.

Q. Does this conclude your direct testimony?

A. Yes, it does.

Kevin M. Noonan

Orlando Utilities Commission, 100 West Anderson Street, Orlando, Florida, 32802

Professional Summary

A government relations, metering, sustainability and customer service professional with more than 24 years of experience in developing innovative government outreach and customer focused programs.

Orlando Utilities Commission

Director, Legislative Affairs *July 2015 to Present*

Responsible for developing and implementing the organization's political engagement strategy with state and local elected officials, as well as other key government officials and policymakers. Work towards passage of OUC sponsored legislation while also guiding and advising the organization on other proposed legislation and regulations that may impact OUC. Attend hearings, committee meetings, and council meetings and provide appropriate responses when necessary. Prepare proposed legislative recommendations and advise on processes that may lead to policy development. Prepare summary papers to advise OUC leadership and internal stakeholders on key legislative and regulatory matters for state and local activities.

Director, Customer Service *June 2013 to July 2015*

Manage internal and external contact centers providing service to 200,000 residential customers with a focus on increasing customer satisfaction and reducing bad debt. Implemented new web and IVR technologies to assist with the automation of customer contacts. Merged Customer Information Systems, closed walk-in service centers, and added third party payment vendors to increase efficiency and reduce costs. Implemented prepaid metering as a solution for enhancing customer control over their accounts and reducing bad debt. Oversee a staff of 90 with a budget of $6.5 M.

Director, Conservation & Renewables *February 2009 to June 2013*

Developed and implemented all new customer conservation and education programs, including water and electric demand-side management (DSM) efforts. Managed customer rebates and efficiency incentives for commercial and residential customers, including solar thermal and solar photovoltaic rebate programs. Responsible for proactive key account management for OUC's largest customers, managing OUC's Corporate and Departmental Sustainability planning efforts, and coordinating with the OUC Interdepartmental Team on large scale renewable energy projects. Oversaw a staff of 16 auditors and conservation professionals with an annual budget of $9.5M.

Director, Residential Customer Service *December 2005 to February 2009*

Managed all residential customer service functions for OUC's more than 190,000 residential customers, including all call centers, walk-in centers, and payment centers. Provided industry-leading service through more than 1 million customer contacts annually. Oversaw OUC's IVR/ACD/skill based routing technology integration for increasing customer satisfaction and service levels. Managed the expansion of customer payment choices to include online and third-party options as well as the conversion to a new customer information system (PS-ERM).

Director, Meter Services *September 2000 to December 2005*
Managed all metering operations, including meter reading, connect and disconnect, meter testing, and meter data management. Oversaw more than 3 million meter readings annually with 99.6% accuracy. Developed the route management project to increase meter reading efficiency and the creation of the service order management team to close customer field orders. Successfully integrated more than 20,000 St. Cloud Electric Utility customers into Orlando meter operations. Launched the roll-out of OUC's first Network Meter Reading System (Itron's MicroNetwork).

Director, Office & Metering Technology *August 1995 to September 2000*
Managed OUC's telecommunications, document and graphic design, records management, print shop, and mailroom functions. Responsible for revenue cycle field operations, including meter reading and connect/disconnect, for OUC's 200,000 customers. Oversaw the deployment of OUC's first Automated Meter Reading (AMR) system, as well as meter reading upgrades and new handheld devices. Served as Y2K Coordinator for the Corporate Services Department.

Special Assistant to General Manager & CEO *July 1994 to August of 1995*
Served as the assistant and representative of the General Manager & CEO. Provided analysis and recommendations for reengineering OUC's supply chain operations. Created Project CARE, the utility payment assistance fund for customers experiencing temporary financial hardship. Served as chair of the Customer Advisory Committee on Conservation. Conducted first research on initial technology for two-way communication to customers through the electric meter.

City of Orlando
Planner I, II & III *May 1991 to July 1994*
Provided fiscal and economic impact analysis, preparation of City's Economic Development Plan, demographic data maintenance and projections, and city/county cost comparisons and annexation studies. Developed and implemented the City's first Concurrency Management System.

Education
Certificate in Management
Rollins College, Crummer Graduate School of Business *1999*
Master of Science in Urban & Regional Planning *(Magna Cum Laude)*
Florida State University *April 1991*
Bachelor of Science in Economics *(Cum Laude)*
Florida State University *August 1989*

Community Involvement
Foundation for Orange County Public Schools
Board Member *2001 to 2014*
Board Chair *2008 to 2009*
Junior Achievement of Central Florida
Classroom Volunteer *2000 to 2012*

Board Member	*2007 to 2009*
Youth Soccer Coach	*2001 to 2012*
Lector, Annunciation Catholic Church	*1998 to Present*

Description of OUC's Existing DSM Programs that Contribute Towards Meeting OUC's Current FEECA Goals

Residential Duct Repair/Replacement Rebate Program

The Duct Repair Rebate Program originated in 2000 and is designed to encourage customers to repair leaking ducts on existing systems. To qualify, ducts must be sealed with mastic or mastic with embedded Underwriters Laboratory (UL) approved duct tape on all accessible boots, joints and seams of the air duct system in both the attic and in any accessible air handler closet. Any penetration of the air duct system through the ceiling must be enclosed with a proper draft stop seal. Participating customers receive a rebate for 100 percent of the cost of duct repairs on their homes, up to $100.

Residential Ceiling Insulation Upgrade Rebate Program

The attic is the easiest place to add insulation and lower total energy costs throughout the seasons. The Ceiling Insulation Rebate Program has been offered for several years and is designed to encourage customers to upgrade their attic insulation. Participating customers receive $0.10 per square foot for upgrading their attic insulation to R-30 or higher.

Residential Window Film/Solar Screen Rebate Program

Installing window film on pre-existing homes can help reflect the heat during hot summer days and help the efficiency of home cooling units. The Window Film/Solar Screen Rebate Program has been offered for several years and is designed to encourage customers to install solar shading on their windows. Participating customers will receive a rebate in the amount of $0.55 per square foot for installation of solar shading film with a shading coefficient of 0.5 or less on east-, west, and south-facing windows. ENERGY STAR® qualified double pane windows do not qualify for this rebate.

Residential ENERGY STAR® Windows Rebate Program

Energy-efficient windows can help minimize heating, cooling, and lighting costs. The ENERGY STAR® Windows Rebate Program has been offered for several years and is designed to encourage customers to install windows that improve energy efficiency in their homes. Customers will receive a $1.50 rebate per square foot for the purchase of energy-efficient windows that are National Fenestration Rating Council certified and meet ENERGY STAR® southern regionally-accepted standards of a U-Factor of 0.4 or less and a Solar Heat Gain Coefficient of 0.25 or less.

Residential Efficient Electric Heat Pump Rebate Program

The Efficient Electric Heat Pump Rebate Program provides rebates to qualifying customers in existing homes who install heat pumps having a seasonal energy efficiency ratio (SEER) of 15.0 or higher. Customers will obtain a rebate in the form of a credit on their bill ranging from $90 to $1,630, depending upon the SEER rating and capacity (tons) of the new heat pump. The following table illustrates the incentives available depending on the size and efficiency of the Heat Pump installed.

AC Size (Tons)	SEER Upgraded To:								
	15	16	17	18	19	20	21	22	23
1	-	-	$95	$135	$170	$205	$230	$260	$280
1.5	-	$105	$175	$230	$285	$330	$375	$415	$450
2	-	$160	$250	$325	$400	$460	$520	$570	$620
2.5	$90	$215	$325	$425	$510	$590	$660	$725	$785
3	$115	$270	$400	$520	$625	$720	$805	$885	$955
3.5	$145	$320	$475	$615	$740	$850	$950	$1,040	$1,125
4	$175	$375	$550	$710	$850	$975	$1,090	$1,195	$1,290
5	$230	$485	$705	$900	$1,075	$1,235	$1,380	$1,510	$1,630

Residential New Home Rebate Program

Previously named The Residential Gold Ring Home Program, the program has been transformed into a more flexible "a la carte" program offering a variety of choices for the builder or home buyer. This transformation was based on feedback OUC received from the residential building community in order to increase the level of participation in OUC's program. The table below reflects an example of the incentives available.

Rebates	Rate of Rebates
1. Ceiling Insulation Upgrade: Final R-Values greater than R-30 is required to receive this rebate.	($0.03 per sq. ft.) when processed with heat pump or ENERGY STAR® heat pump water heater
2. Heat Pump: Provide and upload a copy of the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) Certificate or the AHRI Reference number. Only SEER ratings of 15 or higher qualify.	(From $90-$1,630)
3. ENERGY STAR® Heat Pump Water Heater: Proof of Energy Star qualification is required to receive rebate.	(100% of cost up to $500)

To be eligible for energy rebates, the property must be located in OUC's electric service territory. Applications for the rebates must be submitted within six months from the closing date. Unconditioned space does not qualify for energy efficiency rebates. Any existing construction is not eligible for this program.

Residential Efficiency Delivered Program

What was once referred to as the Home Energy Fix-Up Program, the Efficiency Delivered program has been revamped and expanded to allow for any OUC customer (both energy and water) to participate. The program is available to residential customers (single family home, townhome, or condominium) and provides up to $2,000 of energy and water efficiency upgrades based on the needs of the customer's home. A Conservation Specialist

from OUC performs a survey at the home and determines which home improvements have the potential of saving the customer the most money. The program is an income based program which is the basis for how much OUC will help contribute toward the cost of improvements and consists of three household income tiers:

Household Income	OUC Contribution
Less than $40,000	85% (not to exceed $2,000)
$40,001–$60,000	50% (not to exceed $2,000
Greater than $60,000	Rebates only

- $40,000 or less OUC will contribute 85 percent of the total cost (not to exceed $2,000),
- $40,001 to $60,000 OUC will contribute 50 percent of the total cost (not to exceed $2,000),
- greater than $60,000 OUC will contribute the rebate incentives that apply toward the total cost.

Each customer must request and complete a free Residential Energy Survey. Ordinarily, Energy Survey recommendations require a customer to spend money replacing or adding energy conservation measures: however, customers may not have the discretionary income to implement these measures (especially those in the lower income tier). Under this program, OUC will arrange for a licensed, approved contractor to perform the necessary repairs based on a negotiated and contracted rate. The remaining portion of the cost the customer is responsible for can be paid directly to OUC or over an interest-free 12-month period on the participant's monthly electric bill. To be eligible for this program, the customer's account must be in good credit standing with the exception of low-income customers, who are only required to have a current balance. Some of the improvements covered under this program include attic insulation, duct leak repair, hot water pipe insulation, window film, window caulk, door caulk, door weather stripping, air filter replacement, toilet replacement, irrigation repairs, water flow restrictors and minor plumbing repairs.

The purpose of the program is to reduce energy and water costs, especially for low-income households, and particularly those households with elderly persons, disabled persons and children. Through this program, OUC helps to lower the bills of customers who may have difficulty paying their bills, thereby decreasing the potential for costly service disconnect fees and late charges. OUC believes that this program will help customers afford other essential living expenses. For others, this program offers a one-stop-shop to facilitate the implementation of a whole suite of conservation measures at reasonable costs and pre-screened qualified contractors.

Efficiency Delivered contractor(s) are selected through a Request for Proposal (RFP) process on a routine basis. Eligible customers are referred to the participating contractor after the OUC Conservation Specialist inspection is complete. The Efficiency Delivered contractor then inspects the home and creates a proposal to install eligible measures. Once the customer accepts the proposal and signs the agreement the contractor calls the customer and schedules the work. Typically the work is completed within 45 days. Upon receipt of notice of completion and customer acceptance, payment to the contractor is processed and the customer's share of the conservation improvements is billed. Participation is tracked based on completed installations.

Commercial Efficient Electric Heat Pump Rebate Program

The Commercial Heat Pump Rebate Program provides rebates to qualifying customers in existing buildings who install heat pumps having a seasonal energy efficiency ratio (SEER) of 15.0 or higher. Customers will obtain a rebate in the form of a credit on their bill ranging from $90 to $1,630, depending upon the SEER rating and capacity (tons) of the new heat pump. The following table illustrates the incentives available depending on the size and efficiency of the heat pump installed.

AC Size (Tons)	SEER Upgraded To:								
	15	16	17	18	19	20	21	22	23
1	-	-	$95	$135	$170	$205	$230	$260	$280
1.5	-	$105	$175	$230	$285	$330	$375	$415	$450
2	-	$160	$250	$325	$400	$460	$520	$570	$620
2.5	$90	$215	$325	$425	$510	$590	$660	$725	$785
3	$115	$270	$400	$520	$625	$720	$805	$885	$955
3.5	$145	$320	$475	$615	$740	$850	$950	$1,040	$1,125
4	$175	$375	$550	$710	$850	$975	$1,090	$1,195	$1,290
5	$230	$485	$705	$900	$1,075	$1,235	$1,380	$1,510	$1,630

Commercial Duct Repair Rebate Program

The Duct Repair Rebate program started in 2009. OUC will rebate 100 percent of cost, up to $100. To qualify, ducts must be sealed with mastic or mastic with embedded Underwriters Laboratory (UL) approved duct tape on all accessible boots, joints and seams of the air duct system in both the attic and in any accessible air handler closet. Any penetration of the air duct system through the ceiling must be enclosed with a proper draft stop seal.

Commercial Window Film/Solar Screen Rebate Program

The Commercial Window Film/Solar Screen rebate program started in 2009 and is designed to help reflect the heat during hot summer days and retain heat on cool winter days. OUC will rebate customers $0.55 per square foot for window tinting and solar screening with a shading coefficient of 0.5 or less on east-, west- and south-facing windows. ENERGY STAR® qualified double pane windows do not qualify for this rebate.

Commercial Ceiling Insulation Upgrade Rebate Program

The Commercial Ceiling Insulation Rebate Program started in 2009 and was designed to increase a building's resistance to heat loss and gain. Participating customers receive $0.10 per square foot, for upgrading their attic insulation to R-30 or higher.

Commercial Cool/Reflective Roof Rebate Program

The Commercial Cool/Reflective Roof Rebate Program started in 2009 and was designed to reflect the sun's rays and lower roof surface temperature while increasing the lifespan of the roof. It helps lower the energy bill during the summer by preventing heat absorption. OUC will rebate customers at $0.12 per square foot for ENERGY STAR® cool/reflective roofing that has an initial solar reflectance greater than or equal to 0.70.

Custom Incentive Program

OUC's Commercial & Industrial Custom Incentive Program offers financial incentives to businesses that install energy efficient upgrades in their facilities. From lighting, HVAC, motors, controls, refrigeration upgrades, etc. Customers can create their own plan that will help save the most. Customers bring their own ideas and OUC will help craft a plan that help improve their bottom line.
Incentives

- $550 per kW non-lighting.
- $250 per kW lighting only. (Applies to OUC's Indoor Lighting Rebate.)
- $.032 per kWh for qualifying first year energy savings.
- Maximum of $100,000 per customer per year.

Indoor Lighting Billed Solution

OUC helps customers avoid upfront capital requirements to install more efficient lighting by offering a cashflow neutral billed solution. Customer's have their lighting upgraded by an OUC qualified contractor and payback the costs through their OUC bill from the monthly savings produced by the lighting upgrade for the duration of the payback period of the project.

LED Street Lighting Upgrade

OUC began a multi-year project to upgrade streetlighting with LED's. OUC has completed converting most of the 100 watt HPS fixtures. OUC is currently in the process of replacing 250 and 400 watt HPS fixtures over the next year or two, when the project is expected to be completed.

Table 1
Comparison of Actual Incremental Conservation Savings to Numeric Conservation Goals – Residential Programs

Calendar Year	Winter Peak		Summer Peak		MWh Energy Reduction	
	Total Achieved Reduction	Commission Approved Goals	Total Achieved Reduction	Commission Approved Goals	Total Achieved Reduction	Commission Approved Goals
2015	368	40	447	50	842	140
2016	409	80	482	80	1,161	300
2017	314	120	416	120	826	450
2018	267	160	384	160	763	600
2019		210		200		720
2020		210		210		770
2021		220		210		800
2022		200		190		720
2023		180		190		660
2024		160		160		570

Table 2
Comparison of Actual Cumulative Conservation Savings to Numeric Conservation Goals – Residential Programs

Calendar Year	Winter Peak		Summer Peak		MWh Energy Reduction	
	Total Achieved Reduction	Commission Approved Goals	Total Achieved Reduction	Commission Approved Goals	Total Achieved Reduction	Commission Approved Goals
2015	368	40	447	50	842	140
2016	777	120	929	130	2,003	440
2017	1,091	240	1,346	250	2,828	890
2018	1,358	400	1,730	410	3,591	1,490
2019						
2020						
2021						
2022						
2023						
2024						

Table 3
Comparison of Actual Incremental Conservation Savings to Numeric Conservation Goals – Commercial / Industrial Programs

Calendar Year	Winter Peak		Summer Peak		MWh Energy Reduction	
	Total Achieved Reduction	Commission Approved Goals	Total Achieved Reduction	Commission Approved Goals	Total Achieved Reduction	Commission Approved Goals
2015	759	490	2,177	200	13,432	340
2016	2,107	570	2,528	280	12,259	500
2017	4,996	700	5,037	300	31,008	660
2018	4,665	700	3,653	360	34,684	750
2019		660		370		820
2020		700		390		850
2021		780		400		560
2022		780		370		850
2023		740		390		820
2024		700		360		800

Table 4
Comparison of Actual Cumulative Conservation Savings to Numeric Conservation Goals – Commercial / Industrial Programs

Calendar Year	Winter Peak		Summer Peak		MWh Energy Reduction	
	Total Achieved Reduction	Commission Approved Goals	Total Achieved Reduction	Commission Approved Goals	Total Achieved Reduction	Commission Approved Goals
2015	759	490	2,177	200	13,432	340
2016	2,866	1,060	4,705	480	25,691	840
2017	7,862	1,760	9,742	780	56,699	1,500
2018	12,527	2,460	13,396	1,140	91,383	2,250
2019						
2020						
2021						
2022						
2023						
2024						

Table 5
Comparison of Actual Incremental Conservation Savings to
Numeric Conservation Goals – Residential and Commercial / Industrial Programs

Calendar Year	Winter Peak		Summer Peak		MWh Energy Reduction	
	Total Achieved Reduction	Commission Approved Goals	Total Achieved Reduction	Commission Approved Goals	Total Achieved Reduction	Commission Approved Goals
2015	1,127	530	2,624	250	14,273	480
2016	2,516	650	3,010	360	13,420	800
2017	5,310	820	5,454	420	31,833	1,110
2018	4,931	860	4,038	520	35,447	1,350
2019		870		570		1,540
2020		910		600		1,620
2021		1,000		610		1,360
2022		980		560		1,570
2023		920		580		1,480
2024		860		520		1,370

Table 6
Comparison of Actual Cumulative Conservation Savings to
Numeric Conservation Goals – Residential and Commercial / Industrial Programs

Calendar Year	Winter Peak		Summer Peak		MWh Energy Reduction	
	Total Achieved Reduction	Commission Approved Goals	Total Achieved Reduction	Commission Approved Goals	Total Achieved Reduction	Commission Approved Goals
2015	1,127	530	2,624	250	14,273	480
2016	3,643	1,180	5,634	610	27,694	1,280
2017	8,953	2,000	11,088	1,030	59,527	2,390
2018	13,884	2,860	15,126	1,550	94,974	3,740
2019						
2020						
2021						
2022						
2023						
2024						

Table 7				
2018 Program Winter Peak (kW), Summer Peak (kW), and Annual Energy (MWh) Reductions (at the Generator)				
2018 Programs	**Customer Participation**	**Winter Peak kW Reduction**	**Summer Peak kW Reduction**	**MWh Energy Reduction**
Residential Programs				
Duct Repair/Replacement Rebates	53	15.90	12.19	17
Ceiling Insulation Upgrade Rebates	76	21.80	11.85	31
Window Film/Solar Screen Rebates	17	-0.61	1.84	6
ENERGY STAR® Windows Rebates	157	21.19	34.99	74
Efficient Electric Heat Pump Rebates	957	161.66	271.59	528
New Home Rebates	274	44.57	50.48	105
Efficiency Delivered	6	2.05	1.55	3
Residential Programs Total		**267**	**384**	**763**
Commercial/Industrial Programs				
Efficient Electric Heat Pump Rebates	21	5.05	8.73	16
Duct Repair/Replacement Rebates	-	0.00	0.00	0
Window Film/Solar Screen Rebates	3	-0.12	0.42	2
Ceiling Insulation Upgrade Rebates	2	0.90	0.49	1
Cool/Reflective Roof Rebates	5	0.00	55.00	129
LED Streetlighting (# of fixtures)	5,697	1,070	0	4,300
Indoor Lighting Billed Solution	8	782	782	6,452
Indoor Lighting Rebates	70	1,975	1,975	16,802
Custom Incentives	27	832	832	6982
Commercial/Industrial Programs Total		**4,665**	**3,653**	**34,684**
Residential and Commercial/Industrial Programs Total		**4,931**	**4,038**	**35,447**

Table 8				
2017 Program Winter Peak (kW), Summer Peak (kW), and Annual Energy (MWh) Reductions (at the Generator)				
2017 Programs	**Customer Participation**	**Winter Peak kW Reduction**	**Summer Peak kW Reduction**	**MWh Energy Reduction**
Residential Programs				
Duct Repair/Replacement Rebates	91	27.30	20.93	29
Ceiling Insulation Upgrade Rebates	97	26.74	14.54	38
Window Film/Solar Screen Rebates	18	-0.44	1.31	4
ENERGY STAR® Windows Rebates	179	21.84	36.05	76
Efficient Electric Heat Pump Rebates	903	158.03	265.00	515
New Home Rebates	177	44.65	51.63	107
Efficiency Delivered	95	35.56	26.84	56
Residential Programs Total		**314**	**416**	**826**
Commercial/Industrial Programs				
Efficient Electric Heat Pump Rebates	1	0.42	0.65	1
Duct Repair/Replacement Rebates	1	0.30	0.23	0
Window Film/Solar Screen Rebates	1	-0.03	0.09	0
Ceiling Insulation Upgrade Rebates	1	8.60	4.68	6
Cool/Reflective Roof Rebates	5	0.00	280.96	660
LED Streetlighting (# of fixtures)	2,721	236.53	0.00	951
Indoor Lighting Billed Solution	6	793.00	793.00	5,890
Indoor Lighting Rebates	87	3126.30	3126.30	19,707
Custom Incentives	30	831.33	831.33	3,791
Commercial/Industrial Programs Total		**4,996**	**5,037**	**31,008**
Residential and Commercial/Industrial Programs Total		**5,310**	**5,454**	**31,833**

Table 9				
2016 Program Winter Peak (kW), Summer Peak (kW), and Annual Energy (MWh) Reductions (at the Generator)				
2016 Programs	**Customer Participation**	**Winter Peak kW Reduction**	**Summer Peak kW Reduction**	**MWh Energy Reduction**
Residential Programs				
Duct Repair/Replacement Rebates	140	42.00	32.20	45
Ceiling Insulation Upgrade Rebates	90	22.35	12.15	32
Window Film/Solar Screen Rebates	33	-1.05	3.14	10
ENERGY STAR® Windows Rebates	203	25.50	42.09	89
Efficient Electric Heat Pump Rebates	1,126	162.31	283.52	563
New Home Rebates	99	114.54	80.48	363
Efficiency Delivered	82	43.64	28.73	60
Residential Programs Total		**409**	**482**	**1,161**
Commercial/Industrial Programs				
Efficient Electric Heat Pump Rebates	113	10.93	20.44	38
Duct Repair/Replacement Rebates	96	28.80	22.08	37
Window Film/Solar Screen Rebates	1	-0.02	0.07	0
Ceiling Insulation Upgrade Rebates	3	23.53	12.79	16
Cool/Reflective Roof Rebates	10	0.00	612.84	1,440
LED Streetlighting (# of fixtures)	1,882	183.88	0.00	739
Indoor Lighting Billed Solution	1	66.33	66.33	299
Indoor Lighting Rebates	39	983.91	983.91	5,909
Custom Incentives	24	809.66	809.66	3,780
Commercial/Industrial Programs Total		**2,107**	**2,528**	**12,259**
Residential and Commercial/Industrial Programs Total		**2,516**	**3,010**	**13,420**

Table 10				
2015 Program Winter Peak (kW), Summer Peak (kW), and Annual Energy (MWh) Reductions (at the Generator)				
2015 Programs	**Customer Participation**	**Winter Peak kW Reduction**	**Summer Peak kW Reduction**	**MWh Energy Reduction**
Residential Programs				
Duct Repair/Replacement Rebates	367	112.00	84.00	117
Ceiling Insulation Upgrade Rebates	125	42.00	23.00	60
Window Film/Solar Screen Rebates	36	-	1.00	1
ENERGY STAR® Windows Rebates	188	44.00	72.00	152
Efficient Electric Heat Pump Rebates	1,057	138.00	246.00	468
New Home Rebates	-	-	-	-
Efficiency Delivered	588	32.00	21.00	44
Residential Programs Total		**368.00**	**447.00**	**842**
Commercial/Industrial Programs				
Efficient Electric Heat Pump Rebates	10	2.00	3.00	6
Duct Repair/Replacement Rebates	4	1.00	1.00	2
Window Film/Solar Screen Rebates	6	(0.31)	1.05	5
Ceiling Insulation Upgrade Rebates	13	43.00	23.00	30
Cool/Reflective Roof Rebates	12	-	1,074.80	2,525
LED Streetlighting (# of fixtures)	6,218	390.00	-	1,567
Indoor Lighting Billed Solution	5	13.00	13.00	56
Indoor Lighting Rebates	10	51.00	51.00	331
Custom Incentives	14	262.00	1,014.00	8,918
Commercial/Industrial Programs Total		**759**	**2,177**	**13,432**
Residential and Commercial/Industrial Programs Total		**1,127**	**2,624**	**14,273**

Estimated Residential Cumulative Annual Base Rate Impacts for 2020 through 2029										
DSM Measures Passing Both TRC and Participant Tests										
Calendar Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Percent Increase	0.4%	0.7%	1.2%	1.9%	2.7%	3.8%	5.2%	6.8%	8.6%	10.6%

IN RE: COMMISSION REVIEW OF NUMERIC CONSERVATION GOALS FOR ORLANDO UTILITIES COMMISSION, DOCKET NO. 20190019-EG

DIRECT TESTIMONY OF BRADLEY E. KUSHNER

ON BEHALF OF ORLANDO UTILITIES COMMISSION

I. INTRODUCTION AND QUALIFICATIONS

Q. Please state your name and business address.

A. My name is Bradley E. Kushner, and my business address is 2465 Southern Hills Court, Oviedo, Florida 32765.

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

A. I am employed by nFront Consulting LLC ("nFront") as an Executive Consultant.

Q. Please describe your duties and responsibilities in that position.

A. My responsibilities include project management and project support for various projects for electric utility clients. These projects include integrated resource plans, power supply studies, power supply requests for proposals, demand-side management/conservation reports, and other regulatory filings.

Q. Please summarize your educational background and your employment experience.

A. I received my Bachelor of Science degree in Mechanical Engineering from the University of Missouri-Columbia in 2000 and my Master of Business Administration degree from Emporia State University in 2013. I have nearly 20 years of experience in the engineering and consulting industry. I have experience in the development of integrated resource plans, ten-year site plans, Demand-Side Management and energy conservation plans, and other capacity planning studies for clients throughout the United States. Utilities in Florida for which I have worked include JEA, Florida Municipal Power Agency, Kissimmee Utility Authority, Orlando Utilities Commission ("OUC"), Lakeland Electric, Gainesville Regional Utilities ("GRU"), Reedy Creek Improvement District, Tampa Electric Company, and the City of Tallahassee. I have performed production cost modeling and economic analysis, and otherwise participated in six need determination dockets that have been filed on behalf of Florida utilities and approved by the Florida Public Service Commission ("PSC"). I have also testified before the PSC in power plant need determinations and Conservation Goal proceedings.

Q. Please summarize your experience relating to energy conservation and electric system planning.

A. I have worked extensively on electric system planning and energy conservation projects over the past 19 years. Of particular relevance to my testimony in this case, I have prepared the Ten-Year Site Plans ("TYSPs") for OUC and have also prepared OUC's Annual Conservation Reports on Demand-Side Management and Conservation Programs since the early 2000s. I have also provided testimony supporting the petitions of OUC and JEA in prior dockets before the Commission for setting these utilities' energy conservation and demand reduction goals pursuant to the Florida Energy Efficiency and Conservation Act ("FEECA"). These goals are referred to herein as a utility's "FEECA Goals."

Q. Please summarize your experience testifying in regulatory proceedings.

A. I have filed testimony and testified on many occasions before utility regulatory commissions, including testimony to the PSC in the following proceedings:

1. 2009 FEECA Goals Dockets for OUC and JEA;
2. Gainesville Renewable Energy Center (GREC) need determination;
3. Greenland Energy Center need determination;
4. Cane Island Unit 4 need determination;
5. Treasure Coast Energy Center Unit 1 need determination; and
6. Stanton Energy Center Unit B need determination.

Q. Are you testifying as an expert in this proceeding? If so, please state the area or areas of your expertise relevant to your testimony.

A. Yes. I am providing both factual and expert testimony regarding OUC's avoided costs, fuel price and energy cost projections, and carbon dioxide ("CO_2") compliance cost projections.

Q. Are you sponsoring any exhibits with your testimony?

A. Yes. I am sponsoring the following exhibits:

Exhibit No. ___ [BEK-1] Resume' of Bradley E. Kushner;

Exhibit No. ___ [BEK-2] Summary of Avoided Unit Costs; and

Exhibit No. ___ [BEK-3] Carbon Regulation Compliance Costs.

II. PURPOSE AND SUMMARY OF TESTIMONY

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

A. I have been engaged by OUC to provide information in support of OUC's analyses of the technical, economic, and achievable potential related to OUC's proposed FEECA Goals for the 2020 through 2029 period that shall be established in this docket. Specifically, my testimony discusses OUC's avoided capital and operating cost information for future power plants, projected energy costs, and projected costs and prices associated with anticipated CO_2 regulation. These projections were furnished to Nexant and

used in Nexant's analyses of the technical, economic, and achievable potential for energy conservation, peak demand reductions, and demand-side renewable energy resource development for OUC.

Q. What issues do you address in your testimony?

A. Relative to the issues identified in Appendix A to the PSC's Order Establishing Procedure, Order No. PSC-2019-0062-PCO-EG ("OEP"), my testimony relates to and supports OUC's testimony and positions on Issues 1, 3, 4, 5, 8, 9, and 10.

Q. Please summarize the main conclusions of your testimony.

A. OUC has no avoided generating capacity costs over the ten-year period from 2020 through 2029 for which FEECA Goals are to be set in this proceeding. OUC's next generation need is estimated to arise in 2032, following expiration of the Stanton A purchase power agreement ("PPA"). The energy costs and avoided unit costs that were furnished to Nexant for its analyses of the technical, economic, and achievable conservation potential for OUC were prepared under my supervision and direction, and these values are appropriate, reasonable, and as accurate as is practicable for projections over the full analysis period, which is from 2020 through 2049. The projected CO_2 compliance costs used by OUC and Nexant for its analyses of OUC's

FEECA Goals potential are based on estimates prepared and used by Florida Power & Light Company ("FPL") and Duke Energy Florida ("DEF"), respectively, and these projections are appropriate and reasonable for this purpose.

III. OUC'S AVOIDED GENERATING CAPACITY COSTS

Q. Please describe OUC's plans for adding electric generating capacity, including both the timing and type or types of OUC's planned generation additions over the period 2020 through 2049.

A. OUC currently has sufficient generating resources to meet its projected reserve requirements through 2031. Accordingly, OUC does not project any need for additional generating resources within the ten-year horizon for the conservation goals to be set in this proceeding, and OUC does not plan to add any generating capacity, either via construction or via PPAs, during this period. This is consistent with OUC's 2018 TYSP and also with OUC's 2019 TYSP, which was filed with the Commission on April 1, 2019.

As discussed previously in my testimony, OUC's next projected capacity requirements are primarily due to the expiration of the existing Stanton A PPA, and thus for purposes of this docket, OUC has assumed that new gas-fired combined cycle ("CC") capacity would be added to maintain reserve margin requirements beginning in 2032. OUC has made no commitment and

has no definitive plan to construct this generating unit, but for purposes of the cost-effectiveness analyses that are necessary in this docket, the CC unit is being considered OUC's avoided unit. In the event OUC were to move forward with construction of this type of generating unit, OUC would likely need to make the decision to do so in the 2026 to 2028 timeframe to allow sufficient time for permitting, licensing, engineering, procurement, and construction.

Q. Does OUC have any avoided generating capacity costs, including either or both self-owned generation additions or power purchase agreements, over the period 2020 through 2029, i.e., the ten-year time horizon for the goal-setting process in this docket?

A. No. As noted above, OUC's next generating resource addition is projected to be in 2032, and OUC has no avoidable generating capacity costs before that time.

Also as noted above, OUC does project a need for additional capacity to maintain reserve margin requirements beginning in 2032, and OUC has accordingly assumed the construction of a combined cycle unit in 2032 for purposes of the cost-effectiveness analyses that are required in the goal-setting process. The costs for this "avoided unit" are presented in my Exhibit No. ___ [BEK-2], and these avoided cost values were also provided to and

used by Nexant in its analyses of the Economic Potential and Achievable Potential for peak demand reductions, energy efficiency savings, and demand-side renewable energy savings by OUC.

IV. OUC'S ENERGY COSTS AND FUEL PRICE PROJECTIONS

Q. Please describe OUC's energy costs over the period 2020 through 2049.

A. OUC's energy costs over the analysis period used in the Economic Potential and Achievable Potential studies prepared by Nexant were prepared under my supervision and direction. The GenTrader® production cost simulation model was used to produce optimized, least-cost generation projections based on the assumed fuel prices and reasonable assumptions regarding unit performance and availability for OUC's generating resources. GenTrader® is a widely used, proprietary power generation production cost model developed by Power Costs, Inc. that optimizes a utility's power production over a defined time period based on available generation units with defined characteristics together with the utility's loads, fuel prices, fuel positions, power contracts, and fuel supply transportation constraints.

OUC's projected natural gas prices are based on a combination of New York Mercantile Exchange ("NYMEX") futures prices for natural gas and projections provided by PIRA Energy Group ("PIRA"), adjusted for delivery to OUC's delivery points. OUC used 100% NYMEX projections through

September 30, 2020, projections based on a 50/50 average of NYMEX and PIRA from October 1, 2020 through September 30, 2022, and projections based entirely on those provided by PIRA Energy Group for the remainder of the study period.

OUC's projected coal prices are based on projections by Energy Ventures Analysis, Inc. ("EVA") for use by OUC as well as recent offers from coal suppliers of Illinois Basin coal.

Q. In your opinion, are the energy costs furnished to and used by Nexant in its analyses of OUC's FEECA Goals potential appropriate for this purpose?

A. Yes, the energy costs are appropriate and as accurate as could reasonably be expected for projections over the analysis period for FEECA Goals potential. OUC's fuel price projections, which represent key foundational input data for any long-term power cost production simulation, are based on reputable, recognized, and widely used industry sources, NYMEX and PIRA. OUC's production cost model is GenTrader®, a widely used and recognized power production cost model. Finally, OUC's unit-specific characteristics and load forecasts used in the GenTrader® power cost simulations are the same, continuously vetted input data that OUC uses for its TYSPs. I have responsibility for compiling and reviewing the data and information

presented in OUC's TYSPs, and I also review OUC's load forecasts and unit specifications as part of my TYSP work. Accordingly, based on my direct and continuous familiarity with this information, as well as my experience with similar information for other utilities, it is my strong opinion that these projections are consistent with industry standards and fully appropriate for OUC's planning purposes and for Nexant's cost-effectiveness analyses of DSM potential.

Q. Did OUC and Nexant utilize any sensitivity cases of projected fuel prices in their analyses of technical, economic, and achievable conservation potential for OUC?

A. Yes. OUC developed sensitivity cases that reflect energy costs that are 25 percent higher and 25 percent lower than those associated with the base case fuel price projections. Nexant performed sensitivity analyses for economic and achievable potential using the same plus/minus 25 percent sensitivities.

V. OUC'S CARBON REGULATION COMPLIANCE COSTS

Q. How did OUC analyze potential carbon regulation costs in its evaluation and analyses of conservation potential for this FEECA Goals docket?

A. I should begin my testimony on this point with the qualification that no carbon regulations that would apply or impose costs on OUC yet exist, and thus there is substantial uncertainty surrounding any such programs and their

potential impacts on OUC's costs. Such uncertainties include the timing or starting date of any carbon regulatory program, the format or mechanism that such a program or programs might take (e.g., mandatory emission limits, a cap-and-trade allowance system like that applied to regulation of sulfur dioxide, or a carbon tax system), and of course, the levels of any potential allowance costs or carbon emissions taxes.

Given these uncertainties, OUC decided that the most reasonable way to address carbon regulatory costs in its FEECA Goals analyses is to use an average of the values prepared and used in these proceedings by FPL and DEF, and accordingly, OUC used the FPL-DEF average CO_2 compliance cost value, expressed in dollars per ton of CO_2 emitted as shown in Exhibit No. ___ [BEK-3]. The timing of CO_2 regulation, and associated CO_2 emissions prices, is consistent with what FPL and DEF used in their CO_2 compliance cost sensitivity analyses. This consistency is also consistent with the PSC's directive (in the OEP for the 2019 FEECA Goals dockets) for consistency among FEECA utilities that elect to evaluate a regulated CO_2 sensitivity.

VI. CONCLUSIONS

Q. Please state the main conclusions of your testimony.

A. OUC utilized a sound and widely used production cost model, GenTrader®, and fuel prices developed by widely used and respected analytical companies and resources to develop estimates of fuel prices and generating costs that were used in the Economic Potential and Achievable Potential analyses developed by Nexant in evaluating potential energy conservation and demand and energy reductions for OUC.

OUC's analysis of OUC's projected peak demands and available generating resources indicates that no additional generating capacity is expected to be needed before 2032. Further, Nexant's analyses show that, for all practical purposes, there are no meaningful Achievable Potential savings for Energy Efficiency, Demand Reduction, or demand-side renewable energy measures for OUC. Accordingly, I support OUC's position as presented in OUC witness Kevin M. Noonan's direct testimony that the Commission should not establish any FEECA Goals for OUC in this proceeding.

Q. Does this conclude your direct testimony?

A. Yes, it does.

OVERVIEW

Mr. Kushner has close to 20 years in the energy industry with a specialty in electric utility system resource planning. His expertise includes the following areas:

- Conservation / Demand-Side Management / Energy Efficiency
- Expert Testimony
- Regulatory Compliance and Support
- Integrated Resource Plans
- Power Supply Studies
- Conventional Energy Technologies
- Renewable Energy Technologies
- Economic Analysis
- Production Cost Modeling
- Independent Engineering
- Project Management
- Power Supply Requests for Proposals (RFPs)

Mr. Kushner has provided testimony in many conservation and energy efficiency dockets, power plant need determination proceedings, and integrated resource plans. Mr. Kushner has managed numerous integrated resource plans, need for power applications, power supply studies, demand-side management/energy efficiency/conservation evaluations and power supply request for proposals (RFPs), among other studies. Mr. Kushner has a demonstrated ability to manage internal and external project teams with diverse experience levels and areas of expertise, both in co-located and virtual environments. Mr. Kushner's experience in project management and expertise in the areas outlined above allow him to collaborate with clients to deliver outstanding services to his clients. His ability to effectively communicate in writing and verbally helps to keep stakeholders informed throughout project lifecycles, and has contributed to his successful experiences as a witness and in formal presentations to clients' Board of Directors.

PROJECT EXPERIENCE

Demand-Side Management / Energy Efficiency/ Conservation (DSM/EE/Conservation)

Mr. Kushner's experience with the evaluation of DSM/EE/Conservation is highlighted by his involvement in the development of conservation goals and demand-side management plans for Florida utilities as part of the 2009 and 2014 Florida Energy Efficiency and Conservation Act (FEECA) filings. Mr. Kushner led development of the filings and testified as to the appropriateness of the numeric goals and process utilized to evaluate the cost-effectiveness of DSM/EE/Conservation programs.

Witness Support

Mr. Kushner has testified as a witness in numerous proceedings related to Determination of Need petitions and Florida Energy Efficiency and Conservation Act (FEECA) filings in the State of Florida, and has been involved as a witness in integrated resource planning (IRP) proceedings elsewhere in the United States. Related experience includes coordinating/leading responses to hundreds of interrogatories and production of document requests.

Electric Utility System Resource Planning / Production Cost Modeling

With his extensive experience in Electric Utility System Resource Planning and production cost modeling, Mr. Kushner recognizes that while industry best practices provide effective guidelines, the unique nature of each client's situation require strategic thinking and the ability to develop plans that are specific to the client's needs. Mr. Kushner's expertise in generation (including conventional and renewable technologies), demand-side management, and fundamentals of production cost modeling allow Mr. Kushner to deliver comprehensive resource plans that clients can utilize for future decision making.

Integrated Resource Plans /Power Supply Studies

Mr. Kushner has been involved as the project manager, study manager, and lead analyst on several integrated resource plans (IRP) or power supply studies during his professional career. Mr. Kushner has been involved in such studies for clients in Alaska, Colorado, Florida, Massachusetts, Michigan, New York, Oklahoma, Texas, and Wisconsin, as well as other states and territories.

Power Supply Requests for Proposals (RFPs)

Power purchases are often an important component of electric utility system planning, and conducting a competitive power supply RFP process may be critical to the ensuring the most cost-effective, reliable, and environmentally responsible alternatives are being considered. Mr. Kushner has experience in the complete RFP lifecycle, including collaborating with clients to develop the RFP, supporting clients during issuance and subsequent management of the RFP process, screening and evaluating RFP responses, presenting the results of the RFP to clients and stakeholders, and supporting negotiations related to power purchase agreements. Mr. Kushner has been managed or otherwise been involved in numerous RFP processes focused on both conventional and renewable generating technologies.

Independent Engineering / Project Financing Support

Mr. Kushner has managed projects in the area of independent engineering, related to merger and acquisition support as well as development of new power projects. Most recently, Mr. Kushner managed the independent engineering assessment of a new biomass facility in North America for which the developer was trying to obtain project financing. The independent engineering assessment included development of a due diligence report on behalf of the developer, supporting negotiations with potential investors, supporting development of the credit agreement with the eventual loan syndicate, and monthly construction monitoring activities.

PROFESSIONAL HISTORY

Mr. Kushner began his career with Black & Veatch Corporation in 2000 and has been involved

in electric utility system resource planning and independent engineering engagements since that time in various roles at Black & Veatch. Most recently, Mr. Kushner was Department Head for Black & Veatch's Management Consulting group and was a Director for Black & Veatch Management Consulting LLC's electric system resource planning service offering before joining nFront Consulting LLC in 2016.

EDUCATIONAL

Mr. Kushner's educational background includes a B.S. in Mechanical Engineering from the University of Missouri - Columbia and a Master of Business Administration from Emporia State University.

	All Avoided Costs in Nominal Dollars		
Year	Avoided Capital Cost per kW	Avoided Fixed O&M per kW	**Total Avoided Cost per kW**
2032	$96.84	$15.83	**$112.68**
2033	$96.84	$16.15	**$112.99**
2034	$96.84	$16.47	**$113.32**
2035	$96.84	$16.80	**$113.65**
2036	$96.84	$17.14	**$113.98**
2037	$96.84	$17.48	**$114.32**
2038	$96.84	$17.83	**$114.67**
2039	$96.84	$18.19	**$115.03**
2040	$96.84	$18.55	**$115.39**
2041	$96.84	$18.92	**$115.76**
2042	$96.84	$19.30	**$116.14**
2043	$96.84	$19.69	**$116.53**
2044	$96.84	$20.08	**$116.92**
2045	$96.84	$20.48	**$117.32**
2046	$96.84	$20.89	**$117.73**
2047	$96.84	$21.31	**$118.15**
2048	$96.84	$21.74	**$118.58**
2049	$96.84	$22.17	**$119.01**
2050	$96.84	$22.61	**$119.46**

Year	CO_2 Emissions Price (Nominal $/Ton)
2025	$2.50
2026	$4.26
2027	$5.92
2028	$7.88
2029	$9.60
2030	$11.66
2031	$13.63
2032	$15.64
2033	$17.72
2034	$19.86
2035	$22.08
2036	$24.07
2037	$26.12
2038	$28.22
2039	$30.39
2040	$32.62
2041	$34.99
2042	$37.47
2043	$40.06
2044	$42.80
2045	$45.68
2046	$48.74
2047	$51.99
2048	$55.45
2049	$59.16
2050	$63.15