

April 1, 2019

Carlotta Stauffer
Florida Public Service Commission
Office of Commission Clerk
2540 Shumard Oak Blvd
Tallahassee, Florida 32399-0850

Subject: 2019 Orlando Utilities Commission Ten-Year Site Plan

Dear Ms. Stauffer

Enclosed please find an electronic copy of the 2019 Orlando Utilities Commission (OUC) Ten-Year Site Plan (TYSP). The 2019 OUC TYSP was prepared by nFront Consulting LLC (nFront) and is being submitted by nFront on behalf of OUC.

If you have any questions about this TYSP, please do not hesitate to contact me.

Respectfully submitted,

/s/ 

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Orlando Utilities Commission

2019 Ten-Year Site Plan

Prepared by:
nFront Consulting LLC
April 1, 2019



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1.0 EXECUTIVE SUMMARY

This report documents the 2019 Orlando Utilities Commission (OUC) Ten-Year Site Plan pursuant to Section 186.801 Florida Statutes and Section 25-22.070 of Florida Administrative Code. OUC's Ten-Year Site Plan provides information required by this rule and consists of the following additional sections:

- Utility System Description (Section 2.0)
- Strategic Issues (Section 3.0)
- Forecast of Peak Demand and Energy Consumption (Section 4.0)
- Demand-Side Management (Section 5.0)
- Forecast of Facilities Requirements (Section 6.0)
- Supply-Side Alternatives (Section 7.0)
- Economic Evaluation Criteria and Methodology (Section 8.0)
- Analysis and Results (Section 9.0)
- Environmental and Land Use Information (Section 10.0)
- Conclusions (Section 11.0)
- Ten-Year Site Plan Schedules (Section 12.0)

OUC has assumed responsibility for supplying all of St. Cloud's loads through calendar year 2032. Load forecasts for OUC and St. Cloud have been integrated into one forecast, and details of the aggregated load forecast are provided in Section 4.0, including base-case growth, high-growth, and low-growth scenarios.

OUC has a contract to provide power to Bartow through calendar year 2020, a contract to sell power to Lake Worth through calendar year 2025, a contract to sell power to Winter Park through calendar year 2019, and a contract to sell power to Florida Power & Light through 2020. The power OUC is currently planning to provide to Bartow, Lake Worth, Winter Park, and Florida Power & Light is summarized in Section 2.0.

OUC is a member of the Florida Municipal Power Pool (FMPP), which consists of OUC, Lakeland Electric (Lakeland), and the Florida Municipal Power Agency (FMPA) All-Requirements Project. Power for OUC is supplied by units owned entirely by OUC, as well as units in which OUC maintains joint ownership and power purchases. OUC's available capacity as of January 1, 2019, including capacity from units owned by OUC, St. Cloud's entitlement to Stanton Energy Center Unit 2, and OUC's current power purchases (including natural gas, as well as landfill gas and solar resources), provides total net summer capacity of approximately 1,877 megawatts (MW) and total net winter capacity of approximately 1,916 MW¹.

As illustrated in Section 6.0 of this report, OUC is projected to have adequate capacity to maintain a 15 percent reserve margin throughout the 2019 through 2028 planning period reflected in this Ten-Year Site Plan; as such, no new capacity additions are included in this Ten-Year Site Plan.

¹ Net seasonal capacity ratings as of January 1, 2019. Includes capacity owned by OUC and St. Cloud, as well as OUC's contractual power purchases.

2.0 UTILITY SYSTEM DESCRIPTION

At the turn of the 20th century, John M. Cheney, an Orlando, Florida judge, organized the Orlando Water and Light Company and supplied electricity on a part-time basis with a 100 kilowatt (kW) generator. Twenty-four hour service began in 1903. The population of the City of Orlando (City) had grown to roughly 10,000 by 1922, and Cheney, realizing the need for wider services than his company was capable of supplying, urged his friends to work and vote for a \$975,000 bond issue to enable the citizens of Orlando to purchase and municipally operate his privately owned utility. The bond issue passed by a margin of almost three to one, as did a subsequent issue for additional improvements. The citizens of Orlando acquired Cheney's company and its 2,795 electricity and 5,000 water customers for a total initial investment of \$1.5 million.

In 1923, OUC was created by an act of the state legislature and was granted full authority to operate electric and water municipal utilities. The business was a paying venture from the start. By 1924, the number of customers had more than doubled, and OUC had contributed \$53,000 to the City.

When Orlando citizens took over operation of their utility, the City's population was less than 10,000; by 1925, it had grown to 23,000. That year, more than \$165,000 was transferred to the City, and an additional \$111,000 was transferred in 1926.

Today, OUC operates as a statutory commission created by the legislature of the State of Florida as a separate part of the government of the City. OUC has full authority over the management and control of the electric and waterworks plants in the City and has been approved by the Florida legislature to offer these services in Osceola County, as well as Orange County. OUC's charter allows it to undertake, among other things, the construction, operation, and maintenance of electric generation, transmission, and distribution systems, chilled water systems, as well as water production, transmission, and distribution systems, to meet the requirements of its customers.

In 1997, OUC entered into an Interlocal Agreement with the City of St. Cloud in which OUC assumed responsibility for supplying all of St. Cloud's loads for the 25-year term of the agreement, which added an additional 150 square miles of service area. OUC also assumed management of St. Cloud's existing generating units and power purchase contracts. This agreement has been extended through 2032.

2.1 Existing Generation System

Presently, OUC has ownership interests in four electric generating plants, which are described further in this section. Table 2-1 summarizes OUC's generating facilities, which include:

- Stanton Energy Center Units 1 and 2, Stanton A, and Stanton B.
- Indian River Plant Combustion Turbine Units A, B, C, and D².
- Lakeland Electric McIntosh Unit 3.
- Florida Power & Light Company (FPL) St. Lucie Unit 2 Nuclear Generating Facility.

² As discussed throughout this report, OUC has purchased the steam units at the Indian River site; however, the units are currently in Extended Cold Shutdown and, therefore, are not included in calculations of OUC's available capacity.

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Table 2-1 Summary of OUC Generation Facilities

(As of January 1, 2019)

PLANT NAME	UNIT NO.	LOCATION (COUNTY)	UNIT TYPE	FUEL		FUEL TRANSPORT		COMMERCIAL IN-SERVICE MONTH/YEAR	EXPECTED RETIREMENT MONTH/YEAR	NET CAPABILITY	
				Pri	Alt	Pri	Alt			Summer MW	Winter MW
Indian River	A	Brevard	GT	NG	FO2	PL	TK	06/89	Unknown	15.6 ⁽¹⁾	18.1 ⁽¹⁾
Indian River	B	Brevard	GT	NG	FO2	PL	TK	07/89	Unknown	15.6 ⁽¹⁾	18.1 ⁽¹⁾
Indian River	C	Brevard	GT	NG	FO2	PL	TK	08/92	Unknown	83.0 ⁽²⁾	88.5 ⁽²⁾
Indian River	D	Brevard	GT	NG	FO2	PL	TK	10/92	Unknown	83.0 ⁽²⁾	88.5 ⁽²⁾
Stanton Energy Center	1	Orange	ST	BIT	NG	RR	PL	07/87	Unknown	302.3 ⁽³⁾	302.3 ⁽³⁾
Stanton Energy Center	2	Orange	ST	BIT	NG	RR	PL	06/96	Unknown	339.4 ⁽⁴⁾	339.4 ⁽⁴⁾
Stanton Energy Center	A	Orange	CC	NG	FO2	PL	TK	10/01	Unknown	184.2 ⁽⁵⁾	188.5 ⁽⁵⁾
Stanton Energy Center	B	Orange	CC	NG	FO2	PL	TK	02/10	Unknown	292.0	307.0
McIntosh	3	Polk	ST	BIT	--	RR	--	09/82	Unknown	133.0 ⁽⁶⁾	136.0 ⁽⁶⁾
St. Lucie ⁽⁷⁾	2	St. Lucie	NP	UR	--	TK	--	06/83	Unknown	60.0	62.0
⁽¹⁾ Reflects an OUC ownership share of 48.8 percent. ⁽²⁾ Reflects an OUC ownership share of 79.0 percent. ⁽³⁾ Reflects an OUC ownership share of 68.6 percent. ⁽⁴⁾ Reflects an OUC ownership share of 71.6 percent and St. Cloud entitlement of 3.4 percent. ⁽⁵⁾ Reflects an OUC ownership share of 28.0 percent. ⁽⁶⁾ Reflects an OUC ownership share of 40.0 percent. ⁽⁷⁾ OUC owns approximately 6.1 percent of St. Lucie Unit No. 2. Reliability exchange divides 50 percent power from Unit No. 1 and 50 percent power from Unit No. 2.											

The Stanton Energy Center is located 12 miles southeast of Orlando, Florida. The 3,280-acre site contains Units 1 and 2, as well as Units A and B, and the necessary supporting facilities. Stanton Unit 1 was placed in commercial operation on July 1, 1987, followed by Stanton Unit 2, which was placed in commercial operation on June 1, 1996. Both units are fueled primarily by pulverized coal and can generate up to approximately 70 MW on natural gas, utilize natural gas igniters, and operate at emission levels that are within the Environmental Protection Agency (EPA) and the Florida Department of Environmental Protection (FDEP) requirement standards for sulfur dioxide (SO₂), nitrogen oxides (NO_x), and particulates (PM). Stanton Unit 1 is a 441 MW net coal-fired facility; OUC has a 68.6 percent ownership share of this unit, which provides 302 MW of capacity to the OUC system. Stanton Unit 2 is a 453 MW net coal-fired generating facility; OUC maintains a 71.6 percent (324 MW) ownership share of this unit.

OUC has entered into an agreement with Kissimmee Utility Authority (KUA), FMPA, and Southern Company-Florida LLC (SCF, an affiliate of Southern Power), which governs the ownership of Stanton A, a combined cycle unit at the Stanton Energy Center that began commercial operation on October 1, 2003. NextEra Energy recently purchased Southern Power's interest in Stanton A, and as such, discussion of Stanton A's ownership structure refers to NextEra Energy throughout this Ten-Year Site Plan, as appropriate. OUC, KUA, FMPA, and NextEra Energy are joint owners of Stanton A, with OUC maintaining a 28 percent ownership share (and purchases 52 percent), KUA and FMPA each maintaining 3.5 percent ownership shares, and NextEra Energy maintaining the remaining 65 percent of Stanton A's capacity. Stanton A is a 2x1 combined cycle utilizing General Electric combustion turbines. Stanton A is dual-fueled with natural gas as the primary fuel and No. 2 oil as the backup fuel.

Stanton B is a 1x1 combined cycle utilizing General Electric combustion turbines. Stanton B is dual-fueled with natural gas as the primary fuel and No. 2 oil as the backup fuel. OUC is the sole owner of Stanton B.

The Indian River Plant is located four miles south of Titusville on US Highway 1. The 160-acre Indian River Plant site contains three steam electric generating units (No. 1, 2, and 3) and four combustion turbine units (A, B, C, and D). The three steam turbine units were sold to Reliant Energy in 1999, with OUC subsequently repurchasing the units. Given their current condition (the units are currently in Extended Cold Shutdown), the Indian River steam units do not provide generating capacity for OUC, but do provide OUC with future options for new generating capacity. The combustion turbine units are primarily fueled by natural gas, with No. 2 fuel oil as an alternative. OUC has a partial ownership share of 48.8 percent (approximately 31 MW summer and 36 MW winter) in Indian River Units A and B, as well as a partial ownership share of 79 percent (approximately 166 MW summer and 177 MW winter) in Indian River Units C and D.

McIntosh Unit 3 is a 340 MW net unit operated by Lakeland Electric. McIntosh Unit 3 is fueled primarily by pulverized coal and also uses supplementary natural gas. OUC has a 40 percent ownership share in McIntosh Unit 3, providing approximately 133 MW of capacity (summer capacity; winter capacity is 136 MW) to the OUC system.

OUC has a 6.08951 percent ownership share in St. Lucie Unit 2 (a nuclear generating facility operated by FPL), providing approximately 60 MW of summer and 62 MW of winter generating capacity to OUC. A reliability exchange with St. Lucie Unit 1 results in half of the capacity being supplied by St. Lucie Unit 1 and half by St. Lucie Unit 2.

St. Cloud has an entitlement to capacity from Stanton Unit 2 associated with its purchase through FMPA (related to FMPA's participation in the Stanton II Project). FMPA's ownership stake in Stanton Unit 2 through the Stanton II Project is 23.2 percent, and St. Cloud's purchase from FMPA's Stanton Unit 2 ownership is 14.67 percent (providing approximately 15 MW).

2.2 Purchase Power Resources³

OUC has a purchase power agreement (PPA) with NextEra Energy for 80 percent of NextEra Energy's ownership share of Stanton A. The utilities originally had options to extend the PPA beyond its initial term. Subsequent amendments to the original PPA continued OUC's capacity purchase until September 30, 2023. OUC's Stanton A PPA has been extended through December 2031.

2.3 Power Sales Contracts

OUC has the following contractual power sales:

- a contract to provide power to Bartow through 2020
- a contract to provide power to Lake Worth through 2025
- a contract to provide power to Winter Park through 2019
- a contract to provide power to Florida Power & Light through 2020.

For purposes of this Ten-Year Site Plan, OUC has assumed the winter and summer capacities and annual energy presented in Table 2-2 will be provided to Bartow, Lake Worth, Winter Park, and Florida Power & Light.

³ OUC's renewable power purchases are discussed in Section 2.4 of this Ten-Year Site Plan.

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Table 2-2 Projected Annual Summer and Winter Peak Capacity (MW) and Annual Net Energy for Load (GWh) to be Provided to Vero Beach, Bartow, Lake Worth, WinterPark, and Florida Power & Light

	SUMMER MW			
	Bartow	Lake Worth	Winter Park	Florida Power & Light
2019	40	38	17	100
2020	40	39		100
2021		40		
2022		40		
2023		41		
2024		41		
2025		42		
2026				
2027				
2028				
	WINTER MW			
	Bartow	Lake Worth	Winter Park	Florida Power & Light
2019/20	40	38	17	70
2020/21		39		
2021/22		40		
2022/23		40		
2023/24		41		
2024/25		41		
2025/26		42		
2026/27				
2027/28				
	ANNUAL GWh			
	Bartow	Lake Worth	Winter Park	Florida Power & Light
2019	279	251	98	45
2020	280	255		46
2021		257		
2022		259		
2023		262		
2024		265		
2025		267		
2026				
2027				
2028				
All rounded to nearest MW or GWh				

2.4 OUC's Renewable Energy and Sustainability Initiatives and Community Activities

OUC is actively incorporating renewable technologies into its diverse generation portfolio and taking other steps to reduce carbon emissions. In 2015, OUC set a Clean Energy Strategy goal of 20 percent retail sales from renewables and conservation by 2020, and in 2017, the City of Orlando announced that it is committed to have the City of Orlando entirely powered by clean and renewable energy by 2050. These targets require investment in both landfill gas and solar generation. Technologies such as solar and landfill gas allow OUC to provide the necessary power demand to customers while reducing harmful effects on the environment.

Renewable energy, energy efficiency, sustainability and community activities are crucial to reducing the total demand for power. OUC's recent renewable energy and sustainability initiatives, as well as OUC's recent activities in the community and customer education initiatives, are discussed in the following subsections⁴.

2.4.1 Solar

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 will 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.

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.

⁴ Please refer to Section 5.0 of this Ten-Year Site Plan for discussion of OUC's conservation and demand-side management programs.

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 is adding additional solar to its fleet of natural gas, coal, solar, and landfill gas generation already on-site at 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 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.

The Florida Municipal Solar Project is 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 megawatts, which is enough energy to power 45,000 average Florida homes. Each solar site is designed to generate 74.5 megawatts of energy. OUC will be purchasing 108.5 MW of solar capacity from the project through Power Purchase Agreements with NextEra.

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 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 OUC to determine how to make future solar installations more efficient. The peak capacity for this test array will be approximately 24 kW depending on the amount of solar panels 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.

2.4.2 Landfill Gas

Methane or landfill gas is created by the decomposition of wet organic waste under anaerobic, or oxygenless, conditions in a landfill. This gas is considered a renewable energy source because the anaerobic digestion process continues as waste materials are constantly added to the landfill.

In partnership with Orange County, OUC captures methane gas emissions from county landfill cells and pipes it to the Stanton Energy Center where it is co-fired with coal. In addition to helping to reduce greenhouse gas emissions, this 8 MW project has the potential to displace more than three percent of the coal burned at the Stanton Energy Center. It will be capable of producing in excess of 100,000 megawatt-hours (MWh) of reduced-emissions power – offsetting about 44,000 tons of coal each year. OUC and Orange County have signed new agreements for future landfill projects, expanding capacity to 22 MW.

In December 2015, OUC began receiving energy from the CBI project at the John Drury Landfill, located in Holopaw in Osceola County, for a minimum of 9 MW with an option to expand up to 25 MW of landfill gas energy. For the CBI project, OUC built a new 25 kV distribution line that is comprised of 15.5 miles of overhead and nearly five miles of underground line. The new feeder line will send clean, renewable energy from the landfill to an OUC electric substation in St. Cloud and is the longest distribution feeder on the grid. This feeder will play a large role in OUC’s clean energy strategy.

OUC has also entered into long-term PPAs for landfill gas projects with WMI in Broward County (6 MW) and GES in Charlotte County (2.56 MW).

2.4.3 Carbon Capture

OUC is participating in research projects with the Department of Energy to investigate Carbon Capture and Utilization via recycling carbon from flue gases.

2.4.4 Carbon Reduction

With more than 775 vehicles – ranging from plug-in hybrids to bucket trucks – OUC’s fleet logs more than 4.7 million miles annually. OUC reduces its carbon footprint by using alternative fuels, purchasing more electric vehicles and recycling automotive products to help the environment. As part of an overall plan to reduce emissions in its fleet, OUC uses “B20” – a blend of 80 percent petroleum diesel and 20 percent biodiesel – a clean-burning alternative fuel made from new or used vegetable oils and animal fats, including recycled cooking grease. Compared to petroleum diesel, biodiesel produces lower emissions, so it is better for the environment. B20 has been integrated seamlessly into the fueling system without any changes to vehicles or fuel storage and distribution equipment. OUC uses biodiesel at the Pershing Fleet Center and the Gardenia site. OUC is also in the process of installing two new 10,000-gallon fuel tanks that will store E85 fuel at its Pershing and Gardenia sites. In the next year, OUC will have approximately 50 new vehicles that will be able to use this fuel.

As a result of a \$2.5 million grant from the Florida Department of Environment Protection, Central Florida’s LYNX transit system plans to open a biodiesel blending facility and fueling station at its Orlando Operations Center that will be used by both OUC and Orange County.

Embracing fuel-efficient technology as a commitment to green initiatives, OUC was the first municipal utility in Florida to acquire a plug-in hybrid vehicle that gets up to 99 miles per gallon. OUC has grown the commitment to include six all-electric cars, seven plug-in electric hybrids, and 34 hybrids in the fleet and is one of only a few other utilities throughout the country to test Nissan’s new all-electric E-NV 200 cargo van. Additionally, OUC has installed 150 public level 2 and 5 DC fast chargers meet the needs of the growing numbers of electric vehicles in our territory. This pushes Orlando to one of the top 5 EV ready cities in the United States. OUC has provided an additional 40 level 2 charging stations to meet the needs of our growing fleet and employee needs. OUC also offers discounts to employees who choose to charge their vehicles at work, utilize the SunRail commuter train, and use the LYNX city bus system to get to and from work.

OUC currently has five hybrid bucket trucks and one auxiliary battery system to operate the aerial tower hydraulics. Bucket trucks are a promising application for hybrid technology since much of the vehicle’s work is done when stationary. The hybrid diesel-electric system allows the main engine to be turned off while crews operate entirely off the battery, therefore reducing the production of greenhouse gases and reducing fuel consumption for idling.

OUC’s Fleet Division has incorporated a number of eco-conscious policies, including the use of earth-friendly products and special care taken to dispose contaminated fuels according to environmental standards. Tires, batteries, and oil filters are recycled through vendors, while antifreeze and motor oil are handled on-site. OUC recycles about 20,000 gallons of used oil each year. OUC also has a vehicle idling policy that requires the engine to be turned off after five minutes. Diesel engines use about one gallon of fuel per hour when idling, so this policy saves about \$4 per hour per vehicle.

As part of OUC's commitment to alternative fuels and efficient transportation, three of the 32 EV charging stations at Reliable Plaza are offset by the sun. A 16-panel solar array provides a total of 2.8 kW of power to charge the vehicles at stations in the garage. At night or on a cloudy day when the sun is not shining, the power is drawn from Reliable Plaza. When the sun is shining but no car is charging, the power is fed back into the building. OUC can access a special website to track real-time information and total system usage for its charging stations and the public charging in our territory. Users have a key fob for the charging station and supply their own power cord. Plug-in drivers can go to mychargepoint.net to locate available charging stations nationwide. Users register with ChargePoint to set up an account that links to their credit card. The power is billed through a third-party agreement with ChargePoint, which remits the electricity fees back to OUC each month.

In 2016, OUC enhanced its EV programs with the launch of a new Commercial EV Charging Station Program that encourages adoption of EVs by providing customers a turnkey option for charging stations at their facilities. The program offers two options: *Charge It*, where OUC owns and maintains the equipment with electric usage billed separately, and *Own It*, where OUC provides a turnkey solution and the commercial customer owns the equipment.

In 2018, OUC relaunched the Electrification program and established two key events that align with one of the program's initiatives to help increase electric vehicle adoption in Central Florida. The first event that OUC hosted was an Electric Vehicle Ride and Drive designed to introduce customers to electric vehicles and build awareness about electric vehicle technology. The event was held at Camping World Stadium on Friday, June 15 and Saturday, June 16. Over the two-day event, 140 guests attended with 304 test drives. Our second ride and drive event is scheduled for April 2019 and the intent is to execute two to four ride and drive events per year thereafter. The second event is the Florida Utility Electric Vehicle Roundtable. This a semi-annual event was created to discuss EV friendly policy, corridor charging planning and joint initiatives with all municipal and investor-owned utilities from across Florida. The first in the series of roundtables hosted by OUC was held on Monday, September 17, 2018 with more than 70 attendees. To date, discussions have included the current and future state of EVs in Florida, the Volkswagen settlement and two joint initiatives for data acquisition and a technology pilot.

In 2015, OUC implemented a cost-effective solution that ensures compliance with the EPA's regulation on Mercury and Air Toxics Standards (MATS). OUC developed a testing program to evaluate injecting halogenated activated carbon into the path of the flue gas; this allows the mercury to change its chemical state thus allowing it to be captured by the electrostatic precipitator and scrubbers. Another test that is still in the research and development phase is how to grow and harvest algae using coal flue gas.

OUC is working on planting sections of the 3,280 acres at the Stanton Energy Center. The site uses less than 1,000 acres currently and by planting new trees, OUC will measure and track the recycling of CO₂ from the electric generating units to reduce its overall carbon footprint.

OUC continues to improve on operations at the Stanton Energy Center with a new design on the Unit 2 steam turbine that provides an additional 12 MW of output without increasing the fuel consumption or emissions. The improvement also includes adding natural gas ignitors on both units to enable them to run at lower loads and increase operational flexibility. This allows OUC to take advantage of lower natural gas prices and saves the expense of shutting the unit down for short periods of time. OUC recently completed

installation of variable frequency drives on Unit 2 to improve efficiency while operating at low load levels, and is planning on similar upgrades to Unit 1 during 2020 as well as additional efficiency improvements for Unit 2 during 2019.

2.4.5 Energy Efficiency and Sustainability

OUC's commitment to efficiency and sustainability is also demonstrated by Reliable Plaza, OUC's energy and water efficient center on South Orange Avenue that opened in 2008 and replaced OUC's 40-year-old Administration Building. Reliable Plaza earned Gold Leadership in Energy and Environmental Design (LEED) certification in 2009, officially cementing the 10-story administration and customer service center as the "Greenest Building in Downtown Orlando." The non-profit U.S. Green Building Council awarded the Gold level certification after completing a review of the building's design and construction. Reliable Plaza also holds a Florida Water Star certification, a voluntary program for new and existing construction that encourages water efficiency in appliances, plumbing fixtures, irrigation systems and landscapes. Reliable Plaza showcases a number of environmentally friendly features designed to use 28 percent less energy and 40 percent less water than a similarly sized facility.

To further demonstrate OUC's commitment to sustainability, many projects are active or are planned across its facilities. These projects focus on improving building efficiency through automation and control technology on its HVAC and lighting equipment in addition to smart irrigation and Xeriscape landscape designs. The latest example is at the Gardenia administrative facility where it has undergone a LED lighting retrofit and a building automation system installation. In 2016, OUC built a living wall to showcase sustainable use of vertical space by replacing impervious surfaces while demonstrating water conservation examples along with Florida-friendly landscaping. It also provides a vertical garden sitting area where employees may take breaks.

OUC's Commercial Indoor Lighting Program helps customers convert old, inefficient lighting to high-efficiency technology. OUC and Orlando Health have entered into agreements to upgrade indoor lighting at both the Arnold Palmer Hospital for Children and the Winnie Palmer Hospital for Women & Babies. More than 15,000 fixtures will be replaced, which will reduce demand by approximately 650 kW with energy savings of more than 6.8 million kilowatt hours, or about \$545,000 in cost savings annually. Since launching the program in 2002, more than 140,000 energy-efficient lighting fixtures have been installed in places such as public schools and hospitals, resulting in annual energy cost savings of about \$4 million. Both projects are expected to be completed during 2018.

In 2012, OUC launched a program to replace 100-watt equivalent streetlights with LED fixtures. The initiative was expanded in 2016 and will now replace 12,000 fixtures used on larger roads and highways, which is about 41 percent of OUC's large roadway streetlights. These lights also will save the City 17 gigawatt-hours of annual energy once the program is complete. Equally important, LED lighting improves safety by emitting whiter, cleaner light that provides better visibility for motorists, pedestrians and law enforcement.

2.4.6 OUC's Green Team

With the philosophy that changing an organization's culture requires both corporate and individual accountability, OUC has established the Green Team – a dedicated group of employee volunteers who work to implement practical, sustainable operations in their respective work areas.

The Green Team identifies ways to increase employee education and engagement and supports Corporate Sustainability projects to improve energy and water efficiency in OUC buildings, reduce waste, lower emissions from operations, and create a healthier, happier environment for employees and customers.

With the Gold LEED-certified Reliable Plaza setting the standard, other OUC facilities have followed suit, implementing a number of environmental efforts, including:

- Retrofitting and upgrading light bulbs and ballasts
- Installing light sensors
- Turning up thermostats
- Cutting back on landscape and exterior building lighting
- Purchasing Energy Star-rated appliances when replacements are needed
- Using environmentally friendly cleaning products
- Upgrading HVAC systems
- Installing rain sensors on irrigation systems
- Cutting grass less frequently at water plants, substations and areas not highly visible to the public

Going forward, OUC is planning a number of new green initiatives including establishing an Internal Operations Corporate Sustainability Plan. OUC currently has single stream recycling at all of its facilities and recycles industrial materials such as wood pallets, utility meters, wire reels and copper. It keeps metrics of its energy, water, and waste performance. It has developed internal policies such as electronic document storage, online document review, double-sided printing and specifies the use of recycled paper and office products whenever practical.

2.4.7 Sustainability Community Activities

In 2018, conservation specialists conducted presentations, provided face-to face consultations, scheduled audits, and disseminated information on conservation programs. Below is a list of events the OUC Sustainability Department participated in along with Community Relations:

- National Agriculture Day in St. Cloud
- Neighborhood & Community Summit
- Green Economy Summit
- Winter Park Earth Day
- Lake Eola Earth Day
- AAGO Trade Show
- Florida Fair Housing Summit
- Orange County Community Conference
- Fall Plant and Garden Festival
- Hispanic Business and Consumer Expo
- St. Cloud Life Expo and Extravaganza [Orlando or Central Florida] Home and Garden Show

2.4.8 Neighborhood Meetings (Fall Into Savings)

In 2018, OUC hosted six Fall Into Savings neighborhood meetings, traveling our service territory to visit residents in the City of Orlando Districts to share tips and programs available to help customers conserve and save money on their utility bill. More than 400 customers attended these meetings and had the

opportunity to learn about and sign up for various efficiency programs like Efficiency Delivered, OUC Power Pass, OUC Alerts, Residential Rebates, as well as to schedule free in-home energy/water audits. All attendees received a conservation kit and even had the chance to win raffle prizes that help with home efficiency upgrades.

2.4.9 Home Utility Report Program

The Home Utility Report Program (HUR) is a free service offered to OUC customers designed to help them save energy, water, and money. The report compares a customer's energy and water consumption to similar households, as well as provides personalized tips that show how much they can save by changing their behavior. Customers also can log on to the Home Utility Report website at www.oucsavingtool.com where they can customize an action plan and even get a list of preferred contractors who can help with any efficiency needs. Participants receive a free HUR bi-monthly via email or printed report. To administer the HUR program, OUC works with a third-party company that helps utilities meet their efficiency goals through effective customer engagement.

2.5 Transmission System

OUC's existing transmission system in Orlando consists of 31 substations interconnected through approximately 335 miles of 230 kV, 115 kV, and 69 kV lines. OUC is integrated into the Florida Reliability Coordinating Council (FRCC) regional transmission grid through twenty-one 230 kV and one 69 kV metered interconnections with other utilities, as summarized in Table 2-3. Additionally, OUC is responsible via an Interlocal Agreement for planning, operating and maintaining St. Cloud's four substations, 55 miles of transmission lines and three interconnections, as summarized in Table 2-4.

Table 2-3 OUC Transmission Interconnections

UTILITY	KV	NUMBER OF INTERCONNECTIONS
FPL	230	2
Duke Energy Florida (DEF)	230	9
KUA	230	2
KUA/FMPA	230	2
Lakeland Electric	230	1
TECO	230	2
TECO/Reedy Creek Improvement District	230	2
DEF	69	1
Southern Company	230	1

Table 2-4 St. Cloud Transmission Interconnections

UTILITY	KV	NUMBER OF INTERCONNECTIONS
OUC	69	1
DEF	230	1
KUA	69	1

3.0 STRATEGIC CONSIDERATIONS

OUC incorporates a number of strategic considerations while planning for the electrical system. This section provides an overview of a number of these strategic considerations.

3.1 Strategic Business Units

In 2018, OUC's Electric and Water operations were reorganized into three strategic business units: Energy & Water Production (EWP), Transmission (TRAN) and Energy and Water Distribution (EWD) that report to a Chief Operating Officer.

3.1.1 Energy and Water Production Business Unit

The EWP business unit has structured its operations based on a competitive environment that assumes that even OUC's customers are not captive. EWP will only be profitable if it can produce electricity and water that is competitively priced in the open market. In line with this strategy, OUC is continually studying strategic options to improve or reposition its generating assets, such as the 1999 sale and subsequent repurchase of the Indian River steam units (which provides OUC with full control over the Indian River site and additional alternatives for future new generating resources, including possible repowering of the units)⁵. In addition, OUC formally instituted its Energy Risk Management Program in 2000.

OUC's generating system has been designed over the years to take advantage of fuel diversity and the resultant system reliability and economic benefits. OUC's longstanding intent to achieve diversity in its fuel mix is evidenced by its participation in other generating facilities in the State of Florida. The first such endeavor occurred in 1977 when OUC secured a share of the Crystal River Unit 3 nuclear plant, followed by the acquisition of an ownership share in Lakeland Electric's McIntosh Unit 3 coal-fired unit in 1982. In 1983, OUC also acquired a share of the St. Lucie Unit 2 nuclear unit.

Table 3-1 summarizes OUC's existing capacity by fuel type, including renewable energy resources. The ability to generate up to approximately 70 MW while operating on natural gas in each of Stanton Units 1 and 2 further enhances the percentage of generating capacity fueled by natural gas.

⁵ Based on the current condition of the Indian River steam units (Extended Cold Shutdown), OUC is not currently assigning a firm capacity value to the units for purposes of capacity planning.

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Table 3-1 Capacity (MW) Owned and Purchased by OUC by Fuel Type
(As of January 1, 2019)

PLANT NAME	WINTER CAPACITY						SUMMER CAPACITY					
	Coal	Nuclear	Gas/ Oil	PV	LFG	Total	Coal	Nuclear	Gas/ Oil	PV	LFG	Total
Stanton ⁽¹⁾⁽²⁾	627		846			1,473	627		818	9		1,454
Indian River			213			213			197			197
C.D. McIntosh Jr.	136					136	133					133
St. Lucie		62				62		60				60
Other (MW)					18	18					18	18
Total (MW)	763	62	1,059		18	1,902	760	60	1,015	9	18	1,862
Total (percent)	40.1%	3.3%	55.7%	0.0%	0.9%	100.0%	40.8%	3.2%	54.5%	0.5%	1.0%	100.0%
⁽¹⁾ Includes OUC's share of the landfill gas burned in Stanton Units 1 and 2. ⁽²⁾ Stanton Units 1 and 2 can each generate up to approximately 70 MW while operating on natural gas.												

The diversity of OUC's fuel supply provides protection against disruption of supply while simultaneously providing economic opportunities to reduce cost to customers. OUC recently modified the Stanton Energy Center coal units to allow the units to offset a portion of their coal usage with natural gas. Additional details of OUC's generating facilities are presented in Table 2-1 and Schedule 1 of Section 12.0 of this Ten-Year Site Plan.

OUC's fuel diversity is further enhanced by the renewable energy technologies that contribute to OUC's generating resources. OUC's renewable resources are discussed in detail in Section 2.4 of this Ten-Year Site Plan.

3.1.2 Transmission Business Unit

The OUC Transmission Business Unit is responsible for the planning, engineering, construction, and maintenance of all substations and lines operating at 69kV or higher. To maintain reliable and economic service and proactively plan for the future, OUC is evaluating numerous upgrades to its transmission system. While these upgrades vary in scope and timing, the following list provides an overview of significant projects:

- Work is underway to upgrade the 230kV Stanton to Taft transmission corridor. Engineering and construction will proceed by segment through 2020. Upgrade of this corridor is necessary to reliably meet growth and maintain adequate transfer capability.
- A transmission line routing and feasibility engineering study for the addition of a new 230kV source into downtown Orlando has been conducted. Detailed design is underway and construction is expected to begin in 2020.
- Current growth rates support the need for adding several substation distribution transformers during the next five years.
- Planning and feasibility engineering are underway to evaluate options for potential projects to meet future growth on the St. Cloud system.
- The \$2.3 billion I-4 Ultimate project by the Florida Department of Transportation (FDOT) and its contractor is underway for 21 miles of roadway improvements between Kirkman Road and State Road 434. Coordination of construction activities and mitigation of conflicts around the America Substation, Robinson Substation and multiple transmission lines will occur through 2019.

3.1.3 Energy and Water Distribution Business Unit

OUC's EWD business unit focuses on providing OUC's customers with the safest and most reliable electric service possible.

OUC's leadership in providing reliable electric distribution service is demonstrated by its commitment to making initial investments in high quality material and equipment. Additionally, approximately 60 percent of OUC's distribution system is underground, protecting it from trees and high winds. OUC's dependability is also attributable to its proactive maintenance programs to identify and correct potential problems, proactive replacement of old equipment, and a tree-trimming program that minimizes tree-related service disruptions.

3.2 *Reposition of Assets*

As a strategic consideration, OUC has been working on repositioning its assets. One major consideration was the sale of its Indian River power plant steam units to Reliant Energy in 1999⁶. The sale of the Indian River steam units allowed OUC to take positions in Stanton A and B and to update and diversify its generation portfolio. The sale offered OUC the ability to replace the less competitive oil and gas steam units with more competitive combined cycle generation.

As part of the agreement associated with the termination of the gasification portion of Stanton B, OUC acquired a 165-acre tract of land in its service territory situated near its highest growth areas⁷. The land is in an industrial area and is ideal for a new power generation site, having access to important infrastructure including a rail spur, natural gas lines, and OUC-owned and operated transmission lines.

3.3 *Florida Municipal Power Pool*

In 1988, OUC joined Lakeland Electric and FMPP's All-Requirements Project members to form the Florida Municipal Power Pool (FMPP). Later, KUA joined FMPP. Over time, FMPP's All-Requirements Project has added members as well. FMPP is an operating-type electric pool, which dispatches all the pool members' generating resources in the most economical manner to meet the total load requirements of the pool. The central dispatch provides savings to all parties because of reduced commitment costs and lower overall fuel costs. OUC serves as the FMPP dispatcher and handles all accounting for the allocation of fuel expenses and savings. The term of the pool agreement is three years and automatically renews until terminated by the consent of all participants.

OUC's participation in FMPP provides significant savings from the joint commitment and dispatch of FMPP's units. Participation in FMPP also provides OUC with a ready market for any excess energy available from OUC's generating units.

3.4 *Security of Power Supply*

OUC currently maintains interchange agreements with other utilities in Florida to provide electrical energy during emergency conditions. The reliability of the power supply is enhanced by metered interconnections with other Florida utilities, including nine interconnections with Duke Energy Florida (formerly Progress Energy Florida), four with KUA, two each with Tampa Electric Company and Reedy Creek Improvement District, two with FPL, and one each with Lakeland Electric and St. Cloud. Along with enhancing reliability,

⁶ As discussed previously, OUC recently repurchased the Indian River steam units. Given the current condition of the units (Extended Cold Shutdown), OUC is not assigning a capacity value for purposes of capacity planning. The purchase of the units provides OUC with full control over the Indian River site and additional alternatives for future generation, including possible repowering.

⁷ Originally proposed to be an integrated gasification combined cycle (IGCC) unit, Stanton B was designed to be able to run as a stand-alone natural gas unit with the gasification portion as an alternative fuel source. In 2007, OUC made the decision not to move forward with the gasification portion of Stanton B, and the unit began commercial operation in February 2010 as a 1x1 combined cycle unit operating on natural gas as the primary fuel with the capability to utilize fuel oil as a secondary fuel source.

these interconnections also facilitate the marketing of electric energy by OUC to and from other electric utilities in Florida.

In addition, in 2017, OUC entered into a new five-year contract for the storage of natural gas to manage price volatility and provide backup fuel during emergencies. The fuel will provide up to 30,000 MMBtu/day to help ensure power reliability.

3.5 Environmental Performance⁸

As the quality of the environment is important to Florida, and especially important to the tourist-attracted economy in Central Florida, OUC is committed to protecting human health and preserving the quality of life and the environment in Central Florida. To demonstrate this commitment, OUC has chosen to operate its generating units with emission levels below those required by permits and licenses by equipping its power plants with the best available environmental protection systems. As a result, even with a second unit in operation, the Stanton Energy Center is one of the cleanest coal-fired generating stations in the nation. Unit 2 is the first of its size and kind in the nation to use selective catalytic reduction (SCR) to remove nitrogen oxides (NO_x). Using SCR and low-NO_x burner technology, Stanton 2 successfully meets the stringent air quality requirements imposed upon it. Stanton A incorporates environmentally advanced technology and enables OUC to diversify its fuel mix while adding more flexibility to OUC's portfolio of owned generation and purchased power. As its newest generating asset, Stanton B further contributes to OUC's environmentally responsible portfolio of generating resources.

This superior environmental performance not only preserves the environment, but also results in many economic benefits, which help offset the costs associated with the superior environmental performance. For example, the high quality coal burned at Stanton contributes to the high availability of the units as well as their low heat rates. Additionally, OUC has installed natural gas igniters for both Stanton 1 and Stanton 2, eliminating the use of No. 6 fuel oil and reducing the amount of coal burned during operations when economical to do so. This allows OUC to dial down the units to as low as 90 MW each. For reference, most coal units are only able to operate at minimum loads around 50 to 60 percent of the maximum capability rating; however, the Stanton coal units are able to operate as low as 20 percent of maximum capability.

Further demonstrating its environmental commitment to clean air, OUC has signed a contract to burn methane gas collected from the Orange County landfill adjacent to Stanton Energy Center and John Drury Landfill. Methane gas, when released into the atmosphere, is considered 20 times worse than carbon dioxide in terms of possible global warming effects. Stanton 1 and Stanton 2 both have the capability of burning methane.

OUC has also voluntarily implemented a product substitution program not only to protect workers' health and safety but to minimize hazardous waste generation and to prevent environmental impacts. The Environmental Affairs and Safety Divisions constantly review and replace products to eliminate the use of

⁸ Please refer to Section 2.4 of this Ten-Year Site Plan for a detailed discussion of OUC's renewable generating technologies and other environmental initiatives.

hazardous substances. To further prevent pollution and reduce waste generation, OUC also reuses and recycles many products.

3.5.1 Emphasis on Sustainability

OUC completed its first greenhouse gas inventory for the entire company in 2008 and updates the inventory annually. This report helps OUC analyze how it impacts the environment, detailing both operating emissions and ways to reduce greenhouse gases. The greenhouse gas inventory was only a part of a larger initiative to perform a comprehensive sustainability audit of every department in the company. The goal of this effort is to understand both short-term and long-term opportunities to reduce the corporate carbon footprint in all departments and business functions. A comprehensive sustainability audit was completed in 2009, and is produced annually, to serve as a guide to help OUC develop new environmental initiatives.

OUC's commitment to efficiency and sustainability is further demonstrated by the completion of Reliable Plaza, OUC's energy and water efficient center in south downtown, which replaced OUC's previous South Orange Avenue home. OUC's Reliable Plaza has earned Gold Leadership in Energy and Environmental Design (LEED) certification, officially cementing the 10-story administrative center as the "Greenest Building in downtown Orlando." The non-profit U.S. Green Building Council awarded the Gold level certification after completing a review of the building's design and construction. Reliable Plaza also holds a Florida Water Star certification, a voluntary program for new and existing construction that encourages water efficiency in appliances plumbing fixtures, irrigation systems and landscapes. Reliable Plaza showcases a number of environmentally friendly features and uses 28 percent less energy and 40 percent less water than a similarly sized facility.

OUC is No. 1 for the 21st straight year for electric distribution and reliability compared to all major utilities in Florida, according to data submitted to the Public Service Commission.

Building on a platform of advanced digital electric and water meters, OUC launched a series of technology enhancements to support mobile devices, automate its website, add a consumption dashboard, and synchronize its automated phone system with the website and new customer-facing products such as OUC's innovative Power Pass prepaid program. Now, customers can access detailed account information, including their power and water consumption, at any time and on any mobile device. Providing real-time information, combined with energy saving tips, empowers them to make better decisions, which in turn helps make us all more sustainable.

Additionally, smart grid advances are enabling OUC to pinpoint problems – from power outages to water leaks – the moment they occur while tracking crew locations to dispatch the closest truck to resolve customer issues quickly and saving precious resources at the same time.

3.6 Community Relations, Connecting Our Customers, and Economic Development

3.6.1 Community Relations

As Orlando's hometown utility, OUC is committed to helping the community it serves. Individuals and organizations know they can rely on the utility when it matters most –through board involvement, support, employee volunteerism and more. OUC supports more than 400 non-profit and business-based organizations and participates in nearly 150 events each year, while employees volunteer more than

10,000 hours in the community. Many events incorporate sustainability messaging, encouraging the efficient use of energy and water.

From unique solar sculptures at high visibility locations like Camping World Stadium and St. Cloud's Lakefront Park, to solar mobile device charging stations at LYNX bus stations and H₂OUC Hydration Stations at parks and neighborhood centers, OUC's commitment to sustainability can be seen all around town. Additionally, OUC set out to make Orlando one of the most EV-friendly cities in the nation and has installed more than 150 EV charging stations in its service area.

OUC also supports a diverse group of business chambers within its service territory, including the Orlando Chamber, St. Cloud Chamber and Indian American, Hispanic, African-American, Asian, Caribbean, Disability and LGBT chambers. It is also actively involved with economic gardening organizations such as GrowFL, National Entrepreneur Center, Prospera (formerly the Hispanic Business Initiative Fund), Black Business Investment Fund, Athena and technical associations. OUC helped power OiX Orlando, a collective of tech experts, entrepreneurs, and tech industry leaders fueling the explosion of high-tech startups in the region.

3.6.1.1 Utility and Community Volunteerism

OUC launched Project Care, its utility assistance fund, in 1994. The program, managed by United Way 2-1-1, a local, non-profit organization, provides rapid response to customers in need through case management and home energy audits to help with energy efficiency. Since its inception, Project Care has raised more than \$3 million, helping fund more than 19,000 households and thousands of families and individuals. For every \$1 donated, OUC contributes \$2 to the program.

In addition, OUC's Proud Volunteer program encourages and rewards employees for their volunteer work in the community. Employees volunteer more than 10,000 hours every year and help support a variety of non-profit organizations in the community.

The annual OUC Charity Golf Tournament has raised more than \$646,000 for more than 50 Central Florida non-profits since its inception in 1995.

In November 2017, OUC participated in the annual Ride-4-Ronald bike ride to benefit Ronald McDonald House Charities of Central Florida. The OUC team raised over \$15,000 from the event.

3.6.1.2 Water Color Project

Since 2006, OUC has hosted the Water Color Project, a conservation-themed art program that encourages students to highlight the importance of saving water through their artwork. More than 2,700 students from 29 schools have competed to have their artwork featured. Winning elementary school students' art is featured in an annual calendar, while middle and high school students decorate rain barrels. The barrels become a traveling exhibit throughout the community.

3.6.1.3 Project AWESOME

OUC and the Orlando Science Center deliver energy and water conservation workshops to every fifth grader in OUC's service territory via Project AWESOME (Alternative Water & Energy Supply; Observation, Methods & Education). The educational program promotes both water and energy conservation through a hands-on curriculum using content approved by OUC that meets Common Core Standards. As part of an

electric and water conservation and alternative sources educational program, the projects include making an aquifer, building a solar-powered car, and testing low-flow showerheads and compact fluorescent light bulbs (CFLs) against traditional fixtures. Project AWESOME, which launched in 2009, delivers two 90-minute classroom workshops, as well as hands-on labs and pre- and post-classroom activities—energy is covered as part of the earth science section and water during the life science section. More than 40,000 students have gone through the curriculum.

3.6.1.4 Strategic Partnerships Promote Awareness

OUC has leveraged highly visible, professional sports partnerships to highlight OUC’s commitment to sustainability and high-impact economic development efforts.

After assisting with energy and water efficiency features in the design phase of the Orlando Magic’s LEED certified home, Amway Center, OUC has continued its green partnership with the NBA team, including promotion of the facility’s LEED certification and its energy and water efficiency features through highly visible educational signage and on-going digital.

The Magic partnership served as a model for OUC’s agreement with the United States Tennis Association (USTA). The new Home of American Tennis in Lake Nona meets LEED certification standards. OUC is exclusively designated as the “Official Sustainability & Utility Sponsor” and displays savings that can be achieved through initiatives such as EV charging stations, hydration stations, mobile device charging stations and solar arrays on the roofs of shade pavilions. The new facility is expected to bring more than 150 high-wage jobs to the community and attract 100,000 unique visitors per year.

In 2015, OUC became the exclusive electric, water and sustainability utility partner for Orlando City Soccer Club. Within the club’s new MLS soccer stadium, OUC has branded all water fountains and showcases the savings that can be achieved through sustainability initiatives. Both permanent and transitional signage highlighting the energy and water efficiency features were incorporated into the facility along with OUC’s role in helping it achieve LEED certification. In addition, a solar sculpture will be installed outside to demonstrate sustainability and clean energy features at the stadium.

3.6.2 Connecting Customers

From providing better online access to their consumption history to designing convenient and effective conservation programs, OUC arms customers with the information and tools they need to optimize the efficiency of their homes and businesses. This includes the community outreach previously discussed in this report as well as a mix of new technologies and programs designed to provide customers with the information, control and options they desire.

3.6.2.1 Self-Service Options

OUC’s informational website, self-service portal and automated phone system – which see about 70 percent of total customer transactions – are used by over 125,000 customers each month.

Customers are able to find tips, videos on ways to save, as well as frequently asked questions regarding their services. Through their myOUC online profile, they are able to pay their bills, make service requests, request payment extensions and more. The Usage Dashboard and OUC Power Pass program continue to

drive adoption of the website. The site is mobile friendly and accessible from a range of devices including tablets and smartphones.

3.6.2.2 Traditional Media and Digital Outreach

To reach the desired audience, OUC implements comprehensive, integrated media campaigns that utilize print, online, television, radio, social, outdoor media and community partnerships. By diversifying and targeting media, OUC can effectively reach the right customer with the right message. Campaigns cover a range of topics from safety to storm prep to sustainability. These campaigns reinforce OUC's commitment to showing customers how to reduce their energy and water use and ultimately their utility bills while promoting programs and initiatives important to the community.

3.6.2.3 Connections

Connections is a monthly newsletter sent to all OUC customers whether they receive a paper statement or e-bill. The newsletters are posted on www.OUC.com and feature information on OUC's programs, community events, sustainability initiatives, and energy- and water-saving tips.

3.6.2.4 Social Media

Facebook, Twitter, YouTube, and NextDoor allow OUC to update customers about the Commission's community involvement, as well as provide them with conservation tips, outage and restoration updates, and other need-to-know, real-time information that may affect them. Social media platforms also serve as additional customer service outlets, allowing customers to notify OUC about issues needing quick resolution, and provide additional opportunities for the Commission to build interactive relationships with customers and potentially diffuse negative situations.

3.6.2.5 Digital Meters

OUC's entire service area was upgraded with nearly 370,000 digital electric and water meters. The digital meters are easier to read and provide detailed information about customers' daily energy and water use. Meters can be monitored remotely, which reduces costs and time while ensuring an accurate and timely reading for the customer. Remote monitoring also allows OUC to better predict and prevent outages and restore power faster. OUC created Florida's first meter farm consisting of 120 electric meters and four water meters at its Pershing facility. The farm provides information and shows OUC exactly how updates are installed to ensure the meters are working correctly.

3.6.2.5 OUC Power Pass Program

OUC Power Pass is a program that allows customers to pay-as-you-go or pay in advance for utility services allowing the option of avoiding deposits, late fees and a monthly bill. Statistics have shown that pay-before-consumption programs result in less electricity and water usage because customers are more aware of how much they are using. Customers can check on their electric bill or water usage every day using the OUC Power Pass portal or receive alerts via text, email and/or phone. More than 10,000 customers are enrolled in the program to date.

3.6.2.6 Usage Dashboard

Digital meter technology allows customers to monitor electric consumption on an hourly basis and water on a daily basis instead of waiting until the end of the month to receive their bills. The ability to track usage patterns and make adjustments to lower energy bills was one of the items most frequently requested by OUC customers. To accommodate their needs, OUC released the OUC Usage Dashboard to

most residential customers through their myOUC online profile. Because the new system also provides high-consumption alerts via email, changes in usage can be made immediately, and costs can be kept in check.

3.6.2.7 Online Rebate Application

In 2015, the Sustainability Department launched a new online rebate application tool that allows customers to apply for savings without the hassle of paperwork. It is more convenient for customers, reduces transaction times, and has almost eliminated the use of paper and mail for this type of service. Customers are able to access the tool through their myOUC online profile. The new system also streamlines internal work and provides more detailed reports on program enrollment and savings.

3.6.2.8 Project Momentum

OUC upgraded its customer information system from PeopleSoft Enterprise Risk Management to Customer Care & Billing to improve the quality experience for all levels of customers. OUC undertook this major initiative to lay the foundation for future enhancements and new technologies. This complex endeavor took into account other affected systems such as Outage Management, Meter Data Management, Enterprise 1, Geographic Information System, the Web, and Interactive Voice Response. Kicked off in January 2015 and implemented in July 2017, Project Momentum required 200-plus employees from 17 OUC departments and partner contractors to understand and work through hundreds of business processes and thousands of data points. Delivering an improved quality experience for customers is a primary goal of OUC's Strategic Plan.

3.6.2.9 Outage Alerts

OUC launched the first phase of its Alerts program with Outage Alerts in December 2017. The system allows customers to receive information about service outages, including the cause and an estimated restoration time, via text, voice or email. Future Alerts program phases will include billing and consumption notifications, and marketing messages.

3.6.2.10 Billing Alerts

In January 2019, the second phase of OUC's Alerts program expanded to include Billing Alerts. The new feature lets customers set an alert, via text, email or voice, to let them know when their new bill is ready to view and when payment is due. This alert, along with Outage Alerts, launched in 2017, are among new "two-way communication" initiatives OUC has introduced to provide customers. Future Alerts program phases will include consumption notifications and marketing messages.

3.6.3 Economic Development

Orlando has undergone a radical transformation over the years to diversify its economy and attract high-wage positions in technology, medicine, life sciences, and modeling and simulation. With Orlando's increasing emphasis on recruiting, retaining and expanding commercial customers, OUC has become a major player in the region's economic development. Working in partnership with Enterprise Florida, the Orlando Economic Partnership, and city and county governments, the utility is attracting more companies to Orlando and St. Cloud and helping them grow into vital and valuable members of the business community.

To attract large businesses that enhance the vitality of the community, OUC offers two rates. For large power users who qualify, OUC is able to negotiate its already-affordable rates to fit their business needs. The Economic Development Rider (EDR) is available to new or expanding businesses representing select

target industries. Companies must add a minimum of 500 kW demand of new electric load and must create at least 25 new jobs at or above the 150 percent median income level to qualify. The Commercial Industrial Service Rider (CISR) is available to companies that have minimum load of 2,000 kW or greater, served by a single meter. Companies must provide validation of a lower rate offering outside OUC's service territory to qualify.

Details of these rates and other incentives are outlined at www.oucpowersgrowth.com – a website that assists site selectors and businesses seeking to locate and learn more about Orlando and OUC. The site includes property search functionality and is mobile friendly.

4.0 FORECAST OF PEAK DEMAND AND ENERGY CONSUMPTION

OUC prepares 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 as needed. IHS Markit Ltd (Global Insight) provides the economic projection data. Itron provides primary forecasting software, analysis of end-use equipment saturation and efficiencies, and technical expertise.

4.1 Forecast Methodology

OUC has adopted a Statistically Adjusted Engineering (SAE) modeling technique developed by Itron. This approach entails specifying end-use variables (xHeat for heating, xCool for cooling, and xOther for other use) and utilizing these variables in multi-regression models to forecast sales. SAE variables allow anticipated shifts in customer end-use consumption driven by the type, saturation and efficiency of heating and cooling equipment, and other end-use devices to be represented along with econometric drivers and the effects of photovoltaic systems (PV) and electric vehicles (EV) in the forecast models. Itron reviews OUC's application of these techniques and provides data on heating, cooling, and other end-use load trends. These techniques are used to develop the forecasts for both the OUC and St. Cloud service territories.

4.1.1 Residential

The residential sales forecast consists of both a customer forecast model and an average use per customer model. Monthly average use models were estimated using actual data for the period 2004 to 2018. This provides 15 years of historical data and enough observations to estimate strong regression models. Once models showing the number of expected customers and the expected average use per customer are developed, the projected residential sales by year (y) and month (m) are calculated as the product of the customer and average use forecasts:

$$Sales_{y,m} = Customers_{y,m} \times Average\ Usage_{y,m}$$

4.1.1.1 Residential Customer Forecast

Residential customers are forecast as a function of household growth for Orange County for the OUC jurisdiction and Osceola County for the St. Cloud jurisdiction. There is a strong correlation (R^2 of 0.99 for inside the City and 0.98 for outside the City) between historical changes in OUC customer counts and historical changes in Orange County households. Approximately 71 percent of OUC's residential customers are inside the City. St. Cloud historical customer counts correlate well with the Osceola County household values (R^2 of 0.97). The multi-regression model for residential customers is represented as:

$$Customers_{y,m} = \beta_0 + \beta_1(Households_{y,m})$$

The coefficients (β) are outputs of the multi-regression models.

4.1.1.2 Average Use Forecast

The residential forecast models utilize multi-regression modeling made up of three major components:

1. Changes in the economy, such as median household income, household size, and the price of electricity.
2. End-use equipment index variables, which capture the long-term net effect of equipment saturation and equipment efficiency improvements.
3. Weather variables, which serve to allocate the seasonal impacts of weather throughout the year.

The SAE model framework begins by defining energy use for an average customer in year (y) and month (m) as the sum of energy used by heating equipment ($x_{Heat_{y,m}}$), cooling equipment ($x_{Cool_{y,m}}$), and other equipment ($x_{Other_{y,m}}$). The x_{Heat} , x_{Cool} and x_{Other} variables are defined as a product of an annual equipment index and a monthly usage multiplier. This model is represented as:

$$Average\ Usage_{y,m} = \beta_1(x_{Heat_{y,m}}) + \beta_2(x_{Cool_{y,m}}) + \beta_3(x_{Other_{y,m}})$$

Where:

$$x_{Heat_{y,m}} = Economics_{y,m} \times HeatingEquipment_{y,m} \times HDD_Index_{y,m}$$

$$x_{Cool_{y,m}} = Economics_{y,m} \times CoolingEquipment_{y,m} \times CDD_Index_{y,m}$$

$$x_{Other_{y,m}} = Economics_{y,m} \times OtherEquipment_{y,m}$$

A customer's monthly usage level is impacted by several economic factors, including the price of electricity, household size, and household income.

$$Economics_{y,m} = \left(\frac{Price_{y,m}}{Price_{base\ y}} \right)^{-0.1} \times \left(\frac{HH\ Size_{y,m}}{HH\ Size_{base\ y,m}} \right)^{0.2} \times \left(\frac{HH\ Income_{y,m}}{HH\ Income_{base\ y,m}} \right)^{0.2}$$

The annual equipment variables (HeatEquip, CoolEquip, OtherEquip) are defined as a weighted average across equipment types multiplied by equipment saturation levels normalized by operating efficiency levels.

$$HeatEquip_y = \sum_{tech} Weight \times \left(\frac{Saturation_y / Efficiency_y}{Saturation_{base\ y} / Efficiency_{base\ y}} \right)$$

$$CoolEquip_y = \sum_{tech} Weight \times \left(\frac{Saturation_y / Efficiency_y}{Saturation_{base\ y} / Efficiency_{base\ y}} \right)$$

$$OtherEquip_y = \sum_{tech} Weight \times \left(\frac{Saturation_y / Efficiency_y}{Saturation_{base\ y} / Efficiency_{base\ y}} \right)$$

The following degree day index variables serve to allocate the seasonal impacts of weather throughout the year. For historic periods, actual heating degree days ("HDD") and cooling degree days ("CDD") are used. Normal HDDs and CDDs are used for forecast periods.

$$HDD_Index_{y,m} = \frac{HDD_{y,m}}{Normal\ HDD_y}$$

$$CDD_Index_{y,m} = \frac{CDD_{y,m}}{Normal\ CDD_y}$$

4.1.2 Non-Residential

4.1.2.1 General Service Non-Demand (GSND)

The General Service Non-Demand (GSND) and General Service Demand Secondary (GSD Secondary) classes are modeled as a combined General Service Secondary class (GS Secondary) using a single model because the historic data indicates customer migration has occurred back and forth between the two classes. The result is a single model, which produces predicted values with a higher correlation than that of two separate models.

The forecast is later split between GSND and GSD Secondary using the monthly relationships between the two classes in 2018.

The framework for the GS secondary class model is similar to the residential model. It also has three major components and utilizes the SAE model framework. General service customers and general service average use are modeled separately. The end-use equipment variables are based on commercial appliance / equipment saturation and efficiency projections. The economic drivers in the model are the commercial price of electricity and Gross Metro Product Index. The third component is the weather variable, which is entirely composed of CDDs. HDDs are not used in the GS Secondary model because no statistically valid correlation between HDDs and sales could be identified.

GS secondary customers are forecast as a function of population for Orange County for the OUC jurisdiction and Osceola County for the St. Cloud jurisdiction. There is a strong correlation (R^2 of 0.98) between historical changes in customers and historical changes in the Orange County population. St. Cloud historical customers also correlates well with the Osceola County population (R^2 of 0.91).

The GS Secondary use per customer model is represented as:

$$Sales_{y,m} = Customers_{y,m} \times Average\ Usage_{y,m}$$

Sales to six large GSD Secondary customers are excluded from the GS Secondary model discussed above. These six large customers are forecast individually using a combination of SAE techniques, individual customer trending, and customer-specific planning input. These six customers represent approximately five percent of OUC's total load and eight percent of the GS Secondary Load. They are handled individually because each has identifiable growth plans or patterns and/or each individually represents a significant load.

4.1.2.2 General Service Demand (GSD)

Forecast sales to GSD Secondary customers were modeled as discussed above. In addition to the customers taking service at secondary voltage, OUC serves 21 customers (excluding OUC water plants) at primary voltage. Of those 21, 16 are modeled as a group because they have exhibited a consistent load over time. This group of 16 customers represents about 19 percent of the GSD Primary sales.

The five remaining primary customers are forecast individually using a combination of techniques, which includes regression modeling, individual customer trending, and customer-specific planning input. These five customers represent approximately six percent of OUC's total load and 81 percent of the GSD Primary sales.

Sales from the various GSD models are summed to complete the GSD forecast.

4.1.2.3 Streetlights

Private and public lighting consumption is forecast separately. Both classes are not impacted by the weather, and the SAE modeling approach does not apply. Therefore, simple exponential smoothing models with a linear trend are used to generate both forecasts. The forecast for public streetlights reflects the planned schedule for replacement of traditional HPS and MH fixtures with LED fixtures.

4.1.2.4 OUC Use

OUC Use sales are those to OUC Water Plants, OUCooling Plants, and OUC facilities. The OUC Use models utilize CDDs, but not HDDs or the factors included in the "Other" SAE modeling variable.

Binary variables have been inserted in the multi-regression model coinciding with operations date for the three OUC Cooling Plants commissioned in the past 10 years.

4.1.3 Net Energy for Load (“NEL”) and Peak Demand Forecast

The individual OUC and St. Cloud net energy for load forecasts are generated based on the respective sales forecasts described above and the historic relationship between actual monthly sales and NEL. Peak demand forecasts are then developed for each system based on the forecast NEL and the historic relationship between NEL, peak demand and daily weather.

4.2 Base Case Forecast Assumptions

Incorporated into the forecast regression models are sets of underlying economic and demographic, price of electricity, and weather assumptions.

4.2.1 Economics & Demographics

The economic and demographic assumptions are derived from forecasts for Orange County, Osceola County, and the Orlando Standard Metropolitan Statistical Area (“SMSA”) provided by Global Insight.

4.2.1.1 Median Household Income

The residential forecast model uses the Median Household Income in real dollars, which is forecast to grow at an average annual rate of 0.7 percent over the period 2019-2028 as shown in Table 4-1.

4.2.1.2 Gross Metro Product

The non-residential forecast models use Orlando SMSA Gross Metro Product which is projected to grow at an average annual rate of 2.6 percent over the ten-year period 2019 – 2028. Gross Metro Product is shown in Table 4-1.

Table 4-1 Economic & Demographic Projections

Year	Orlando SMSA Median Household Income ¹	Orlando SMSA Gross Metro Product (\$ Billions) ¹	Orange County (Thousands)		Osceola County (Thousands)	
			Households	Population	Households	Population
2019	\$49,712	\$130.0	523.9	1,401.7	128.3	379.4
2024	\$51,568	\$147.3	571.6	1,508.1	150.6	443.8
2028	\$52,771	\$163.4	609.8	1,597.0	169.6	499.5
Average Annual Increase						
19 - 24	0.7%	2.5%	1.8%	1.5%	3.3%	3.2%
19 - 28	0.7%	2.6%	1.7%	1.5%	3.2%	3.1%
(1) 2009 dollars						

4.2.1.3 Households and Population

The primary demographic drivers in the residential forecast model are the number of households and the population (see Table 4-1). Households are used in the residential customer forecast model. The population data is divided by the household data to determine household size used in the residential average use forecast model.

4.2.2 Price of Electricity

The nominal price of electricity by customer class is forecast to increase at the same rate as inflation resulting in essentially no change to the real price of electricity. The real price of electricity by customer class is used in the residential and non-residential forecast models.

4.2.3 Weather

Weather is a key factor affecting electricity consumption for indoor cooling and heating. Monthly CDDs are used to capture electric cooling load requirements while HDDs are used to capture electric heating load requirements. CDDs and HDDs are calculated from the daily average temperatures as reported by the National Weather Service for the weather station at the Orlando International Airport. CDDs are calculated using a 65°F base temperature as follows:

$$CDD_d = (Avg Temp_d - 65°F) \text{ when } Avg Temp_d \geq 65°F$$

The daily CDD values are then aggregated to yield monthly CDDs for each year as follows:

$$CDD_{y,m} = \sum CDD_{y,m,d}$$

Daily HDD values are calculated in a similar manner using a base temperature of 65°F as follows:

$$HDD_d = (65°F - Avg Temp_d) \text{ when } Avg Temp_d \leq 65°F$$

The daily HDD values are then aggregated to yield monthly HDDs for each year as follows:

$$HDD_{y,m} = \sum HDD_{y,m,d}$$

“Normal” monthly weather is assumed to be the median annual degree days for the 30-year period ending 2015.

4.3 Base Case Load Forecast

A long-term annual budget forecast was developed using the methodology and base-case assumptions outlined above.

4.3.1 Customer and Sales Forecast Results

Total retail sales for OUC are expected to increase from 6,028 gigawatt-hours (GWh) in calendar year 2019 to 6,928 GWh in 2028. St. Cloud sales are projected to increase from 739 GWh to 960 GWh over this same period. Shown in Table 4-2 through Table 4-5 are the annual customer and sales forecasts for OUC and St. Cloud.

4.3.1.1 Residential Forecast

With increasing appliance efficiency, increased customer conservation, and declining household size, average use per residential customer is projected to decline over the forecast period 2019 through 2028. Residential sales are projected to grow at an average annual rate of 1.2 percent for OUC and at 2.8 percent for St. Cloud over this same period. The number of residential customers is projected to grow at an average annual growth rate of 1.5 percent for OUC and 3.2 percent for St. Cloud over this same period.

4.3.1.2 GSND Forecast

GSND sales are projected to grow at an average annual rate of 1.0 percent and 3.3 percent for OUC and St. Cloud, respectively, between 2019 and 2029. The number of GSND customers is projected to grow at an average annual growth rate of 1.1 percent and 3.1 percent, respectively, for OUC and St. Cloud over this same period.

4.3.1.3 GSD Forecast

GSD is comprised of large commercial and industrial customers. Sales are projected to show considerable growth as a result of new major commercial development such as new tourist attractions, hotels, airport expansion, and other smaller commercial development. Sales are projected to grow at an average annual rate of 1.5 percent and 3.3 percent for OUC and St. Cloud, respectively, between 2019 and 2028. The number of GSD customers is projected to grow at an average annual growth rate of 1.1 percent and 3.1 percent, respectively, for OUC and St. Cloud over this same period.

Table 4-2 OUC Long-Term Sales Forecast (GWh)

Year	Residential	GSND	GSD	Lighting	OUC Use	Total Retail
2019	1,980	425	3,425	56	143	6,028
2024	2,084	443	3,778	64	249	6,618
2028	2,205	466	3,932	71	254	6,928
Average Annual Increase						
19 - 24	1.0%	0.8%	2.0%	2.8%	11.7%	1.9%
19 - 28	1.2%	1.0%	1.5%	2.8%	6.6%	1.6%

Table 4-3 OUC Average Number of Customers Forecast

Year	Residential	GSND	GSD	Total Retail
2019	178,469	22,031	5,335	205,835
2024	192,397	23,254	5,631	221,281
2028	203,578	24,277	5,877	233,732
Average Annual Increase				
19 - 24	1.5%	1.1%	1.1%	1.5%
19 - 28	1.5%	1.1%	1.1%	1.4%

Table 4-4 St. Cloud Long-Term Sales Forecast (GWh)

Year	Residential	GSND	GSD	Lighting	Total Retail
2019	526	55	155	3	739
2024	604	63	178	3	849
2028	675	74	208	3	960
Average Annual Increase					
19 - 24	2.8%	2.8%	2.8%	-0.4%	2.8%
19 - 28	2.8%	3.3%	3.3%	-0.2%	2.9%

Table 4-5 St. Cloud Average Number of Customers Forecast

Year	Residential	GSND	GSD	Total Retail
2019	36,663	3,483	356	40,501
2024	42,992	4,071	416	47,479
2028	48,541	4,592	470	53,602
Average Annual Increase				
19 - 24	3.2%	3.2%	3.2%	3.2%
19 - 28	3.2%	3.1%	3.1%	3.2%

4.3.2 Forecast Peak Demand and NEL

Peak demand growth is driven by the aggregate retail class energy forecast for OUC and St. Cloud. OUC and St. Cloud peaks and NEL are presented in Tables 4-6 and 4-7, respectively. Table 4-8 represents the combined seasonal peak demand and NEL forecasts for OUC and St. Cloud. Peak demand is forecast to grow at a higher rate than NEL due to non-residential sales growth outpacing residential sales growth.

Table 4-6 OUC Forecast Peak Demand (Summer and Winter) and NEL

Year	Summer (MW)	Winter (MW)	NEL (GWh)
2019	1,162	1,006	6,275
2024	1,278	1,105	6,842
2028	1,335	1,159	7,156
Average Annual Increase			
19 - 24	1.9%	1.9%	1.7%
19 - 28	1.6%	1.6%	1.5%

Table 4-7 St. Cloud Forecast Peak Demand (Summer and Winter) and NEL

Year	Summer (MW)	Winter (MW)	NEL (GWh)
2019	200	172	784
2024	230	196	900
2028	260	222	1,018
Average Annual Increase			
19 - 24	2.8%	2.7%	2.8%
19 - 28	3.0%	2.9%	2.9%

Table 4-8 System Forecast Peak Demand (Summer and Winter) and NEL (Total of OUC and St. Cloud)

Year	Summer (MW)	Winter (MW)	NEL (GWh)
2019	1,362	1,177	7,059
2024	1,507	1,301	7,742
2028	1,596	1,381	8,173
Average Annual Increase			
19 - 24	2.1%	2.0%	1.9%
19 - 28	1.8%	1.8%	1.6%

4.4 High and Low Load Scenarios

In addition to the base case, two long-term forecast scenarios representing a high and low range around the forecast peak demand and NEL were constructed to test for sensitivity of uncertain economic conditions and customer growth. Weather conditions deviating from normal were not included in sensitivity testing due to non-growth related impacts and an equal probability of affecting any given year either negatively or positively. The high and low load scenarios represent alternatives to the base case forecast and are defined by 0.5 percent higher and 0.5 percent lower economic growth rates, respectively. Table 4-9 represents a summary of the high and low load scenarios.

Table 4-9 High and Low Scenario System Forecast Peak Demand (Summer and Winter) and NEL (Total of OUC and St. Cloud)

High Load Scenario			
Year	Summer (MW)	Winter (MW)	NEL (GWh)
2019	1,365	1,178	7,074
2024	1,538	1,327	7,904
2028	1,654	1,432	8,475
Average Annual Increase			
19 - 24	2.4%	2.4%	2.2%
19 - 28	2.2%	2.2%	2.0%
Low Load Scenario			
Year	Summer (MW)	Winter (MW)	NEL (GWh)
2019	1,358	1,178	7,048
2024	1,475	1,275	7,585
2028	1,536	1,331	7,879
Average Annual Increase			
19 - 24	1.7%	1.6%	1.5%
19 - 28	1.4%	1.4%	1.2%

5.0 DEMAND-SIDE MANAGEMENT

Sections 366.80 through 366.85, and 403.519, Florida Statutes (F.S.), are known collectively as the Florida Energy Efficiency and Conservation Act (FEECA). Section 366.82(2), F.S., requires the Florida Public Service Commission (PSC) to adopt appropriate goals designed to increase the conservation of expensive resources, such as petroleum fuels, to reduce and control the growth rates of electric consumption and weather-sensitive peak demand. Pursuant to Section 366.82(6), F.S., the PSC must review the conservation goals of each utility subject to FEECA at least every five years. The seven utilities subject to FEECA are Florida Power & Light Company (FPL), Progress Energy Florida, Inc. (PEF), Tampa Electric Company (TECO), Gulf Power Company (Gulf), Florida Public Utilities Company (FPUC), OUC, and JEA (referred to collectively as the FEECA utilities).

OUC's residential and commercial/industrial numeric conservation goals for the 2015 through 2024 period were established by the PSC pursuant to Order No. PSC-13-0645-PAA-EU. These PSC-established annual goals are presented in Tables 5-1, 5-2 and 5-3.

Table 5-1 Residential DSM Goals Approved by the PSC

Calendar Year	Summer (MW)	Winter (MW)	Annual (GWh)
2015	0.05	0.04	0.14
2016	0.08	0.08	0.30
2017	0.12	0.12	0.45
2018	0.16	0.16	0.60
2019	0.20	0.21	0.72
2020	0.21	0.21	0.77
2021	0.21	0.22	0.80
2022	0.19	0.20	0.72
2023	0.19	0.18	0.66
2024	0.16	0.16	0.57
Total	1.57	1.58	5.73

Table 5-2 Commercial/Industrial DSM Goals Approved by the PSC

Calendar Year	Summer (MW)	Winter (MW)	Annual (GWh)
2015	0.20	0.49	0.34
2016	0.28	0.57	0.50
2017	0.30	0.70	0.66
2018	0.36	0.70	0.75
2019	0.37	0.66	0.82
2020	0.39	0.70	0.85
2021	0.40	0.78	0.86
2022	0.37	0.78	0.85
2023	0.39	0.74	0.82
2024	0.36	0.70	0.80
Total	3.42	6.82	7.25

Table 5-3 Total Residential and Commercial/Industrial DSM Goals Approved by the PSC

Calendar Year	Summer (MW)	Winter (MW)	Annual (GWh)
2015	0.25	0.54	0.48
2016	0.36	0.65	0.80
2017	0.42	0.82	1.11
2018	0.52	0.82	1.35
2019	0.57	0.86	1.54
2020	0.60	0.91	1.62
2021	0.61	1.00	1.66
2022	0.56	0.98	1.56
2023	0.57	0.92	1.48
2024	0.52	0.86	1.37
Total	4.98	8.36	12.97

OUC has been increasingly emphasizing its DSM and conservation programs to increase customer awareness of such programs. Not only do these programs help customers save money by saving energy, the programs help OUC reduce emissions of greenhouse gases and better position OUC to meet possible future greenhouse gas regulations. It should be noted that government mandates have forced manufacturers to increase their efficiency standards, thereby decreasing the incremental amount of energy savings achievable. In addition, the efficiency of new generation has increased and natural gas prices have remained at or near historic lows for the last several years, and look to continue to do so for the near future. These appliance and generating unit efficiency improvements, coupled with low natural

gas prices, have mitigated to some degree the effectiveness of DSM and conservation programs, as overall efficiency increases in the marketplace partially offset the benefit of such programs.

The conservation programs included in OUC's DSM Plan (filed with the PSC on March 16, 2015) and offered to its customers in 2018 consist of the following:

- Residential Home Energy Survey Program – Walk-Through and Online
- 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 Energy Survey 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

The remainder of this section describes each of the DSM and conservation programs outlined above. Incentives and rebate amounts included in the program descriptions are current as of the time this report was prepared. In addition to offering these programs, OUC continues to play an active role in promoting conservation through community relations as discussed in Section 2.4 and Section 3.6 of this Ten-Year Site Plan.

5.1 Energy Survey Programs

5.1.1 Residential Home Energy Survey Program

OUC has been offering home energy surveys dating back to the late 1970's. The home energy walk-through surveys were designed to provide residential customers with recommended energy efficiency measures and practices customers can implement. The Residential Energy Survey Program consists of two measures: the Residential Energy Walk-Through Survey and an interactive Online Energy Survey. These measures are available to both single family and multi-family residential customers.

The Residential Energy Walk-Through Survey includes a complete examination of the attic insulation; heating, ventilation, and air conditioning (HVAC) system; air duct and air returns; window caulking; weather stripping around doors; faucets and toilets; and lawn sprinkler systems. OUC provides participating customers specific tips on conserving electricity and water as well as details on customer rebate programs. OUC Conservation Specialists are using this walk-through type audit as a means of motivating OUC customers to participate in other conservation programs and qualify for appropriate rebates.

In addition to the Energy Walk-Through, OUC offers customers an interactive Online Home Energy Audit. The Online Home Energy Audit walks the customer through a complete visual assessment of energy and water efficiency in his or her home. The online audit has several benefits over the walk-through survey, including the convenience of viewing it at any time without a scheduled appointment and the ability to conduct it numerous times. The interactive Online Home Energy Audit is available on OUC's web site at <http://www.OUC.com/energyaudit>.

One of the primary benefits of the Residential Energy Survey Program is the education it provides to customers on energy conservation measures and ways their lifestyle can directly affect their energy use. Customers participating in the Energy Survey Program are informed about conservation measures that they can implement. Customers will benefit from the increased efficiency in their homes, and decreased electric and water bills.

Participation in the Walk-Through Energy Survey has been consistently strong over the past several years and interest in the interactive Online Home Energy Audit has been high since the measure was first introduced. Feedback from customers who have taken advantage of the surveys has been very positive.

The Home Energy Audit rates how efficient a customer's home energy use is and where one can make improvements to lower utility bills. Participation is tracked through service orders that are produced when appointments are scheduled and completed. Online Surveys are tracked through the service provider (Schneider), who produces monthly activity reports.

5.1.2 Commercial Energy Survey Program

The Commercial/Industrial Energy Survey Program has been offered for several years and is focused on increasing the energy efficiency and energy conservation of commercial buildings and includes a free survey comprised of a physical walk-through inspection of the commercial facility performed by highly trained and experienced energy experts. The survey will examine heating and air conditioning systems including duct work, refrigeration equipment, lighting, water heating, motors, process equipment, and the thermal characteristics of the building including insulation. Following the inspection the customer receives a written report detailing cost-effective recommendations to make the facility more energy and water efficient. Participating customers are encouraged to participate in other OUC commercial programs and directly benefit from energy conservation, which decreases their electric and water bills.

OUC customers can participate by calling the OUC Customer Service Call Center and requesting an appointment for a Business Energy Survey. Participation is tracked through service orders that are produced when appointments are scheduled and completed.

5.2 Rebate Programs

The following outlines the various rebate programs OUC offers to its customers. Customers can participate by submitting a rebate application online at <http://www.OUC.com/rebates>. Proofs of purchase and/or receipts are required to be attached to the application and repairs can be performed by a contractor or the customer. Participation is tracked based on the number of rebates processed. Typically these rebates are credited on the customer's bill, or a check can be processed and sent to the property owner who may have paid for the improvement.

5.2.1 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.

5.2.2 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.

5.2.3 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.

5.2.4 Residential ENERGY STAR® Window 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.

5.2.5 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

5.2.6 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.

5.2.7 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.

5.2.8 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

5.2.9 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.

5.2.10 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.

5.2.11 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.

5.2.12 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.

6.0 FORECAST OF FACILITIES REQUIREMENTS

6.1 Existing Capacity Resources

6.1.1 Existing Generating Capacity

Tables 6-1 and 6-2, which are presented at the end of this section, indicate that the combined installed generating capability for OUC and St. Cloud (as of January 1, 2019) is 1,548 MW in the winter and 1,508 MW in the summer. OUC's existing generating capability (described in more detail in Section 2.0) consists of the following:

- A joint ownership share in the Stanton Energy Center (Units 1, 2, and Stanton A)
- Sole ownership of Stanton Energy Center Unit B (Stanton B)
- Joint ownership shares of the Indian River combustion turbine units
- Joint ownership shares of McIntosh Unit 3 and St. Lucie Unit 2

St. Cloud's entitlement to capacity from Stanton Unit 2 is included as generating capability in Tables 6-1 and 6-2, consistent with the Interlocal Agreement described in Section 2.0.

6.1.2 Power Purchase Agreements

Corresponding to the construction of Stanton A, OUC entered into a PPA with SCF to purchase capacity from SCF's 65 percent ownership share of Stanton A. The original Stanton A PPA was for a term of 10 years and allowed OUC, KUA, and FMPA to purchase all of SCF's 65 percent capacity share. The utilities originally had options to extend the PPA beyond its initial term. Subsequent amendments to the original PPA continued OUC's capacity purchase until September 30, 2023. OUC's Stanton A PPA has been extended through December 2031. As discussed in Section 2, NextEra Energy has purchased SCF's interest in Stanton A.

6.1.3 Power Sales Agreements

OUC's power sales to Bartow, Lake Worth, Winter Park, and Florida Power & Light are described in Section 2.3.

6.1.4 Retirements of Generating Facilities

OUC has not scheduled any unit retirements over the planning horizon, but will continue to evaluate options on an ongoing basis. One factor affecting potential unit modifications and/or retirements is the impact of pending future environmental regulations. OUC will continue to monitor future environmental regulations that may impact its operating fleet and decisions related to generating units, and develop appropriate corresponding compliance plans.

6.2 Reserve Margin Requirements

The FPSC has established a minimum planned reserve margin criterion of 15 percent in 25-6.035 (1) Florida Administrative Code for the purposes of sharing responsibility for grid reliability. The 15 percent minimum planned reserve margin criterion is generally consistent with practice throughout much of the industry. OUC has adopted the 15 percent minimum reserve margin requirement as its planning criterion.

6.3 *Future Resource Needs*

6.3.1 *Generator Capabilities and Requirements Forecast*

Tables 6-1 and 6-2 (presented at the end of this section) display the forecast reserve margins for the combined OUC and St. Cloud systems for the winter and summer seasons, respectively. OUC's capacity from renewable projects (discussed in Section 2.4) that is projected to be available at the time of peak demand is also reflected in Tables 6-1 and 6-2.

Table 6-1 and Table 6-2 indicate that OUC is projected to have adequate generating capacity to maintain the 15 percent reserve margin requirements through the period considered in this Ten-Year Site Plan (i.e. through 2028). As such, this Ten-Year Site Plan does not include any new capacity additions.

6.3.2 *Transmission Capability and Requirements Forecast*

OUC continuously monitors and upgrades the bulk power transmission system as necessary to provide reliable electric service to its customers. OUC's current transmission system planning criteria are summarized in its annual filing to the Federal Energy Regulatory Commission. Please see OUC's FERC Form 715 for additional information.

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Table 6-1 Projected Winter Reserve Requirements – Base Case

Year	Retail and Wholesale Peak Demand (MW) ¹							Available Capacity (MW)				Reserves (MW)			Excess/ (Deficit) Capacity to Maintain 15% Reserve Margin (MW) ⁽⁷⁾
	OUC	STC	Bartow	Lake Worth	Winter Park	Florida Power & Light	Total	Installed ⁽²⁾	SEC A PPA	Landfill Gas ⁽³⁾	Solar ⁽³⁾	Total ⁽⁴⁾	Required ⁽⁵⁾	Available ⁽⁶⁾	
2018/19	1,006	172	40	38	17	70	1,343	1,548	350	18	0	1,916	187	573	386
2019/20	1,020	175	40	39	0	70	1,344	1,556	350	18	0	1,924	190	579	390
2020/21	1,033	179	0	40	0	0	1,252	1,570	350	18	0	1,937	182	685	504
2021/22	1,045	185	0	40	0	0	1,269	1,570	350	18	0	1,937	184	668	484
2022/23	1,093	190	0	41	0	0	1,324	1,570	350	18	0	1,937	192	614	421
2023/24	1,105	196	0	41	0	0	1,342	1,570	350	18	0	1,937	195	595	400
2024/25	1,122	202	0	42	0	0	1,366	1,570	350	18	0	1,937	199	572	373
2025/26	1,135	209	0	0	0	0	1,344	1,570	350	18	0	1,937	202	593	392
2026/27	1,150	215	0	0	0	0	1,366	1,570	350	18	0	1,937	205	572	367
2027/28	1,159	222	0	0	0	0	1,381	1,570	350	18	0	1,937	207	556	349

(1). Peak Demands shown are non-coincident.

(2). Includes existing net capability to serve OUC and St. Cloud.

(3). Capacity of LFG and Solar reflects capacity projected to be available at time of seasonal peak demand.

(4). "Totals" may not add due to rounding.

(5). "Required Reserves" include 15 percent reserve margin on OUC and St. Cloud retail peak demand as well as wholesale sales to Florida Power & Light. OUC is not responsible for providing reserves to Bartow or Winter Park. Wholesale sale shown to Lake Worth includes reserves.

(6). "Available Reserves" equals the difference between total available capacity and total peak demand.

(7). Calculated as the difference between "Available Reserves" and "Required Reserves."

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2019 TEN-YEAR SITE PLAN**

Table 6-2 Projected Summer Reserve Requirements – Base Case

Year	Retail and Wholesale Peak Demand (MW) ¹						Available Capacity (MW)					Reserves (MW)		Excess/ (Deficit) Capacity to Maintain 15% Reserve Margin (MW) ⁽⁷⁾	
	OUC	STC	Bartow	Lake Worth	Winter Park	Florida Power & Light	Total	Installed ⁽²⁾	SEC A PPA	Landfill Gas ⁽³⁾	Solar ⁽³⁾	Total ⁽⁴⁾	Required ⁽⁵⁾		Available ⁽⁶⁾
2019	1,162	200	40	38	17	100	1,557	1,508	342	18	9	1,877	219	320	101
2020	1,179	205	40	39	0	100	1,562	1,529	342	18	9	1,898	223	336	113
2021	1,190	210	0	40	0	0	1,440	1,529	342	18	65	1,954	210	514	304
2022	1,251	216	0	40	0	0	1,507	1,529	342	18	65	1,954	220	446	226
2023	1,265	223	0	41	0	0	1,529	1,529	342	18	65	1,954	223	425	202
2024	1,278	230	0	41	0	0	1,549	1,529	342	18	65	1,954	226	405	179
2025	1,291	237	0	42	0	0	1,570	1,529	342	18	65	1,954	229	384	155
2026	1,304	244	0	0	0	0	1,549	1,529	342	18	65	1,954	232	405	172
2027	1,319	252	0	0	0	0	1,571	1,529	342	18	65	1,954	236	383	147
2028	1,335	260	0	0	0	0	1,596	1,529	342	18	65	1,954	239	358	119

(1). Peak Demands shown are non-coincident.

(2). Includes existing net capability to serve OUC and St. Cloud.

(3). Capacity of LFG and Solar reflects capacity projected to be available at time of seasonal peak demand.

(4). "Totals" may not add due to rounding.

(5). "Required Reserves" include 15 percent reserve margin on OUC and St. Cloud retail peak demand as well as wholesale sales to Florida Power & Light. OUC is not responsible for providing reserves to Bartow or Winter Park. Wholesale sale shown to Lake Worth includes reserves.

(6). "Available Reserves" equals the difference between total available capacity and total peak demand.

(7). Calculated as the difference between "Available Reserves" and "Required Reserves."

7.0 SUPPLY-SIDE ALTERNATIVES

As discussed previously, OUC is projected to have adequate capacity to satisfy forecast reserve margin requirements through 2028 (i.e. through the duration of this Ten-Year Site Plan). As such, no supply-side alternatives have been evaluated as part of this Ten-Year Site Plan.

8.0 ECONOMIC EVALUATION CRITERIA AND METHODOLOGY

This section presents the economic evaluation criteria and methodology used for OUC's current planning processes.

8.1 Economic Parameters

The economic parameters are summarized below and are presented on an annual basis.

8.1.1 Inflation and Escalation Rates

The general inflation rate, construction cost escalation rate, fixed O&M escalation rate, and nonfuel variable O&M escalation rate are each assumed to be 2.0 percent.

8.1.2 Present Worth Discount Rate

The present worth discount rate is assumed to be 6.5 percent.

8.2 Fuel Price Forecasts

The natural gas and fuel oil price forecasts reflected in this Ten-Year Site Plan were developed based on a combination of the NYMEX forward curve and projections provided by PIRA Energy Group (PIRA). PIRA was founded in 1976 and is an international energy consulting firm specializing in global energy market analysis and intelligence. Among other services, PIRA offers consulting on a broad range of subjects in the international crude oil, petroleum products, natural gas, electricity, coal, biofuels and emissions markets. PIRA's clients include international and national integrated oil and gas companies, independent producers, refiners, marketers, oil and gas pipelines, electric and gas utilities, industrials, trading companies, financial institutions and government agencies.

The coal forecast reflected in this Ten-Year Site Plan was developed 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. EVA is a consulting firm that engages in a variety of projects for private and public sector clients related to energy and environmental issues. In the energy area, much of EVA's work is related to analysis of the electric utility industry and fuel markets, particularly oil, natural gas, and coal. EVA's clients in these areas include coal, oil, and natural gas producers; electric utility and industrial energy consumers; and gas pipelines and railroads. EVA also works for a number of public agencies, such as state regulatory commissions, the US EPA, and the US DOE, as well as interveners in utility rate proceedings, such as consumer counsels and municipalities. Another group of clients include trade and industry associations, such as the Electric Power Research Institute, the Gas Research Institute, and the Center for Energy and Economic Development. EVA has provided testimony to numerous state public utility commissions, including the Florida Public Service Commission. Furthermore, the firm has filed testimony in a number of cases in both state and federal courts, as well as before the Federal Energy Regulatory Commission.

9.0 ANALYSIS AND RESULTS

As discussed previously, consideration of OUC's existing generating resources and OUC's current base-case load forecast indicates that OUC is projected to have adequate capacity to satisfy forecast reserve margin requirements through 2028 (the final year considered in this Ten-Year Site Plan). As such, no new capacity additions are included in this Ten-Year Site Plan.

For informational purposes, OUC utilized PCI GenTrader to obtain the annual production costs associated for various load, fuel, and other sensitivity cases. GenTrader is a computer-based chronological production costing model developed for use in power supply system planning. GenTrader simulates the hour-by-hour operation of a power supply system over a specified planning period. Required inputs include the performance characteristics of generating units, fuel costs, and the system hourly load profile for each year.

The cumulative present worth cost (CPWC) calculations presented in this section account for annual system costs (i.e. fuel and energy, non-fuel variable O&M, and startup costs) for each year of the expansion planning period and discounts each back to 2019 at the present worth discount rate of 6.5 percent. These annual present worth costs are then summed over the 2019 through 2028 period to calculate the total CPWC of the expansion plan being considered.

9.1 CPWC Analyses

9.1.1 Base-Case Analysis

The base case considers the base load forecast presented in Section 4 and the base fuel price forecasts. The CPWC associated with the base case analysis is approximately \$2.17 billion.

9.1.2 Sensitivity Analyses

As part of its capacity planning process, OUC considers a number of sensitivity analyses to measure the impact of variations to critical assumptions. Among the numerous sensitivities that OUC may consider in its planning processes are high and low fuel prices, high and low load and energy growth projections, a case in which the differential between natural gas and coal price projections is held constant over time, and a high present worth discount rate case. Of these sensitivities, only the high and low load and energy growth projection sensitivities would potentially impact the timing of unit additions as compared to the base-case analysis. For informational purposes, the following subsections describe the high and low load and energy growth, the high and low fuel price, the constant differential fuel price, and the high present worth discount rate sensitivities.

9.1.2.1 High Load Forecast Sensitivity

The high load forecast is presented in Section 4.0; as with the base case load forecast, OUC is anticipated to have sufficient capacity to maintain its 15 percent reserve margin under the high load forecast sensitivity. The CPWC associated with the high load analysis is approximately \$2.24 billion.

9.1.2.2 Low-Load Forecast Sensitivity

The low-load forecast is presented in Section 4.0; as with the base case load forecast, OUC is anticipated to have sufficient capacity to maintain its 15 percent reserve margin under the low load forecast sensitivity. The CPWC associated with the low-load analysis is approximately \$2.11 billion.

9.1.2.3 High Fuel Price Forecast Sensitivity

OUC's contractual arrangements for coal delivery will mitigate the effects of volatility in coal prices; however, for purposes of this analysis, this factor was not considered. The CPWC associated with the high natural gas and coal price forecast sensitivity is approximately \$2.40 billion.

9.1.2.4 Low Fuel Price Forecast Sensitivity

OUC's contractual arrangements for coal delivery will mitigate the effects of volatility in coal prices; however, for purposes of this analysis, this factor was not considered. The CPWC associated with the low natural gas and coal price forecast sensitivity is approximately \$2.17 billion.

9.1.2.5 Constant Differential Natural Gas and Coal Price Forecast Sensitivity

The constant differential natural gas and coal price forecast sensitivity assumes that differential in price between coal and natural gas projected for 2019 will remain constant through 2028. The CPWC associated with the constant differential natural gas and coal price forecast sensitivity is approximately \$2.25 billion.

9.1.2.6 High Present Worth Discount Rate Sensitivity

The high present worth discount rate sensitivity assumes a 10 percent present worth discount rate instead of the 6.5 percent present worth discount rate used in the other economic analyses discussed in this section. The CPWC associated with the high present worth discount rate sensitivity is approximately \$1.90 billion.

10.0 ENVIRONMENTAL AND LAND USE INFORMATION

As discussed previously, consideration of OUC's existing generating resources and OUC's current base-case load forecast indicates that OUC is projected to have adequate capacity to satisfy forecast reserve margin requirements through 2028 (the final year considered in this Ten-Year Site Plan). As such, no new capacity additions are included in this Ten-Year Site Plan. In general, it should be noted that OUC's existing Stanton Energy Center and Indian River sites may accommodate future generating unit additions.

11.0 CONCLUSIONS

As discussed previously, consideration of OUC's existing generating resources and OUC's current base-case load forecast indicates that OUC is projected to have adequate capacity to satisfy forecast reserve margin requirements through 2028 (the final year considered in this Ten-Year Site Plan). As such, no new capacity additions are included in this Ten-Year Site Plan. In general, it should be noted that OUC's existing Stanton Energy Center and Indian River sites may accommodate future generating unit additions.

12.0 TEN-YEAR SITE PLAN SCHEDULES

This section presents the schedules required by the Ten-Year Site Plan rules for the FPSC. The information contained within the FPSC Schedules is representative of the combined OUC and City of St. Cloud systems, consistent with all sections of the 2019 OUC Ten-Year Site Plan.

ORLANDO UTILITIES COMMISSION
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Schedule 1
Existing Generating Facilities
As of December 31, 2018

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Plant Name	Unit No.	Location	Unit Type	Fuel Pri	Fuel Alt	Fuel Transport Pri	Fuel Transport Alt	Alt. Fuel Days Use	Commercial In-Service Month/Year	Expected Retirement Month/Year	Gen. Max. Nameplate KW ⁽¹⁾	Net Capability Summer MW	Net Capability Winter MW
Indian River	A	Brevard	GT	NG	DFO	PL	TK	0.2	06/89	Unknown	41,400	15.6 ⁽²⁾	18.1 ⁽²⁾
Indian River	B	Brevard	GT	NG	DFO	PL	TK	0.2	07/89	Unknown	41,400	15.6 ⁽²⁾	18.1 ⁽²⁾
Indian River	C	Brevard	GT	NG	DFO	PL	TK	0.2	08/92	Unknown	130,000	83.0 ⁽³⁾	88.5 ⁽³⁾
Indian River	D	Brevard	GT	NG	DFO	PL	TK	0.2	10/92	Unknown	130,000	83.0 ⁽³⁾	88.5 ⁽³⁾
Stanton Energy Center	1	Orange	ST	BIT	NA	RR	UN	UN	07/87	Unknown	464,500	302.3 ⁽⁴⁾	302.3 ⁽⁴⁾
Stanton Energy Center	2	Orange	ST	BIT	NA	RR	UN	UN	06/96	Unknown	464,500	339.4 ⁽⁵⁾	339.4 ⁽⁵⁾
Stanton Energy Center	A	Orange	CC	NG	DFO	PL	TK	3	10/01	Unknown		184.2 ⁽⁶⁾	188.5 ⁽⁶⁾
Stanton Energy Center	B	Orange	CC	NG	DFO	PL	TK	3	02/10	Unknown	333,000	292.0	307.0
McIntosh	3	Polk	ST	BIT	NA	REF	UN	UN	09/82	Unknown		133.0 ⁽⁷⁾	136.0 ⁽⁷⁾
St. Lucie ⁽⁸⁾	2	St. Lucie	ST	NUC	NA	TK	UN	UN	08/83	Unknown		60.0	62.0

NOTES:

⁽¹⁾ Nameplate ratings are reported for units which OUC maintains majority ownership. Values reported are for the entire unit (not just OUC's ownership share)

⁽²⁾ Reflects an OUC ownership share of 48.8 percent.

⁽³⁾ Reflects an OUC ownership share of 79.0 percent.

⁽⁴⁾ Reflects an OUC ownership share of 68.6 percent.

⁽⁵⁾ Reflects an OUC ownership share of 71.6 percent and St. Cloud entitlement of 3.4 percent.

⁽⁶⁾ Reflects an OUC ownership share of 28.0 percent.

⁽⁷⁾ Reflects an OUC ownership share of 40.0 percent.

⁽⁸⁾ Capacity from Crystal River Unit No. 3 Is not included as available capacity given it has not operated since summer of 2009 and is retired.

⁽⁹⁾ OUC owns approximately 6.1 percent of St. Lucie Unit No. 2. Reliability exchange divides 50 percent power from Unit No. 1 and 50 percent power from Unit No. 2.

ORLANDO UTILITIES COMMISSION
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Schedule 2.1
History and Forecast of Energy Consumption and
Number of Customers by Customer Class

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Year	Population	Members per Household	GWH	Rural and Residential Average No. of Customers	Average KWH Consumption Per Customer	GWH	Commercial Average No. of Customers	Average KWH Consumption Per Customer
HISTORY:								
2009	452,220	2.55	2,235	177,163	12,615	317	20,762	15,264
2010	454,300	2.55	2,325	178,197	13,047	311	21,648	14,366
2011	458,940	2.55	2,223	180,072	12,347	311	22,138	14,026
2012	466,940	2.56	2,140	182,570	11,723	319	23,198	13,730
2013	476,916	2.56	2,153	186,455	11,549	345	22,585	15,254
2014	485,016	2.55	2,264	190,279	11,899	379	23,376	16,230
2015	496,659	2.54	2,430	195,606	12,421	393	23,705	16,579
2016	514,813	2.56	2,491	201,424	12,369	401	23,991	16,719
2017	576,536	2.79	2,481	206,959	11,987	424	24,323	17,440
2018	577,895	2.74	2,576	210,899	12,212	475	25,020	18,966
FORECAST:								
2019	589,749	2.74	2,506	215,131	11,651	480	25,514	18,813
2020	598,854	2.73	2,530	219,179	11,544	484	25,868	18,715
2021	608,632	2.72	2,560	223,362	11,461	489	26,223	18,629
2022	618,080	2.72	2,600	227,442	11,433	493	26,581	18,553
2023	627,740	2.71	2,644	231,463	11,421	499	26,949	18,519
2024	638,624	2.71	2,688	235,389	11,420	506	27,325	18,528
2025	649,996	2.72	2,733	239,327	11,419	514	27,707	18,540
2026	659,527	2.71	2,778	243,467	11,409	522	28,098	18,591
2027	671,090	2.71	2,826	247,648	11,411	531	28,483	18,644
2028	681,424	2.70	2,880	252,119	11,424	540	28,869	18,697

Notes:
Represents total of OUC and St. Cloud.

ORLANDO UTILITIES COMMISSION
2019 TEN-YEAR SITE PLAN

Schedule 2.2
History and Forecast of Energy Consumption and
Number of Customers by Customer Class

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Year	GWH	Industrial Average No. of Customers	Average KWH Consumption Per Customer	Railroads and Railways GWH	Street & Highway Lighting GWH	Other Sales to Public Authorities GWH	Total Sales to Ultimate Consumers GWH
HISTORY:							
2009	3,418	6,725	508,217	0	46	15	6,031
2010	3,414	7,201	474,101	0	51	31	6,030
2011	3,422	7,428	460,737	0	34	30	6,021
2012	3,392	7,558	448,853	0	35	30	5,955
2013	3,467	5,718	606,442	0	29	30	6,025
2014	3,489	5,618	621,007	0	30	29	6,191
2015	3,514	5,793	606,546	0	61	139	6,537
2016	3,506	5,811	603,333	0	61	142	6,601
2017	3,480	5,839	595,929	0	59	124	6,713
2018	3,513	5,709	615,262	0	61	146	6,769
FORECAST:							
2019	3,564	5,691	626,271	0	59	143	6,752
2020	3,612	5,762	626,919	0	60	152	6,838
2021	3,638	5,832	623,841	0	62	165	6,914
2022	3,734	5,902	632,647	0	63	219	7,109
2023	3,806	5,973	637,251	0	65	247	7,261
2024	3,842	6,046	635,543	0	67	249	7,353
2025	3,882	6,121	634,259	0	69	250	7,448
2026	3,925	6,196	633,449	0	70	252	7,547
2027	3,970	6,271	633,141	0	72	253	7,652
2028	4,017	6,346	633,014	0	74	254	7,765

Notes:
Represents total of OUC and St. Cloud.

Schedule 2.3
History and Forecast of Energy Consumption and
Number of Customers by Customer Class

(1)	(2)	(3)	(4)	(5)	(6)
Year	Sales for Resale GWH	Utility Use & Losses GWH	Net Energy for Load GWH	Other Customers (Average No.)	Total No. of Customers
HISTORY:					
2009	0	223	6,252	0	204,650
2010	469	277	6,767	0	207,046
2011	768	188	6,977	0	209,638
2012	764	346	7,135	0	214,758
2013	769	272	7,065	0	214,758
2014	1,000	332	7,523	0	219,272
2015	1,317	268	8,120	0	225,104
2016	1,100	278	7,979	0	231,226
2017	1,032	302	8,103	0	241,628
2018	1,040	189	7,998	0	241,628
FORECAST:					
2019	674	307	7,733	0	246,336
2020	581	328	7,747	0	250,809
2021	257	334	7,504	0	255,417
2022	259	358	7,727	0	259,925
2023	262	382	7,905	0	264,385
2024	265	389	8,007	0	268,760
2025	267	394	8,109	0	273,155
2026	0	398	7,945	0	277,761
2027	0	403	8,055	0	282,402
2028	0	408	8,173	0	287,334

Notes:

Represents total of OUC and St. Cloud.

2010 - 2012 "Sales for Resale" represent sales to City of Vero Beach.

2013-2018 "Sales for Resale" represents sales to City of Vero Beach, City of Winter Park, City of Lake Worth, and City of Bartow.

Forecast "Sales for Resale" include projected sales to City of Vero Beach, City of Winter Park, City of Lake Worth, City of Bartow, and Florida Power & Light.

"Net Energy for Load" may not match other Schedules due to rounding.

ORLANDO UTILITIES COMMISSION 2019 TEN-YEAR SITE PLAN

**Schedule 3.1
History and Forecast of Summer Peak Demand
Base Case**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Year	Total	Wholesale	Retail	Interruptible	Residential Load Management	Residential Conservation	Comm./Ind. Load Management	Comm./Ind. Conservation	Net Firm Demand
HISTORY:									
2009	1,244	0	1,244	0	0	0.0	0.0	0.0	1,244
2010	1,295	74	1,218	0	0	1.0	0.0	1.7	1,292
2011	1,371	164	1,205	0	0	1.0	0.0	0.6	1,369
2012	1,381	165	1,214	0	0	0.6	0.0	1.7	1,379
2013	1,413	157	1,256	0	0	0.7	0.0	0.9	1,411
2014	1,500	203	1,297	0	0	0.6	0.0	0.2	1,499
2015	1,531	206	1,325	0	0	0.4	0.0	2.2	1,528
2016	1,620	252	1,368	0	0	0.5	0.0	2.5	1,617
2017	1,638	255	1,383	0	0	0.4	0.0	5.0	1,633
2018	1,541	207	1,334	0	0	0.4	0.0	3.7	1,537
FORECAST:									
2019	1,557	195	1,362	0	0	0.2	0	0.4	1,557
2020	1,563	179	1,384	0	0	0.4	0	0.7	1,562
2021	1,442	40	1,402	0	0	0.6	0	1.1	1,440
2022	1,510	40	1,470	0	0	0.8	0	1.5	1,507
2023	1,531	41	1,491	0	0	1.0	0	1.9	1,529
2024	1,552	41	1,511	0	0	1.1	0	2.3	1,549
2025	1,574	42	1,532	0	0	1.3	0	2.6	1,570
2026	1,553	0	1,553	0	0	1.4	0	3.0	1,549
2027	1,576	0	1,576	0	0	1.6	0	3.4	1,571
2028	1,601	0	1,601	0	0	1.8	0	3.7	1,596

Notes:

Represents total of OUC and St. Cloud. Peak demands may not match other schedules due to non-coincidence of OUC and St. Cloud peaks and/or rounding.

Historical "Residential Conservation" and "Comm/Ind. Conservation" represent annual demand reductions associated with new participants in OUC's DSM programs described in Section 5 of OUC's 2018 Ten-Year Site Plan.

Forecast "Residential Conservation" and "Comm/Ind. Conservation" represent cumulative annual demand reductions associated with new participants in OUC's DSM programs described in Section 5 of OUC's 2018 Ten-Year Site Plan.

2010 - 2012 "Wholesale" represent sales to City of Vero Beach.

2013-2018 "Wholesale" represents sales to City of Vero Beach, City of Winter Park, City of Lake Worth, and City of Bartow.

Forecast "Wholesale" include projected sales to City of Vero Beach, City of Winter Park, City of Lake Worth, City of Bartow, and Florida Power & Light.

Forecast "Net Firm Demand" may not exactly match up with peak demands presented in the 2019 OUC Ten-Year Site Plan due to coincidence and rounding.

ORLANDO UTILITIES COMMISSION
2019 TEN-YEAR SITE PLAN

Schedule 3.2
History and Forecast of Winter Peak Demand
Base Case

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Year	Total	Wholesale	Retail	Interruptible	Residential Load Management	Residential Conservation	Comm./Ind. Load Management	Comm./Ind. Conservation	Net Firm Demand
HISTORY:									
2008/09	1,178	0	1,178	0	0	0.0	0.0	0.0	1,178
2009/10	1,337	36	1,299	0	0	0.8	0.0	0.9	1,335
2010/11	1,323	174	1,147	0	0	0.8	0.0	0.6	1,321
2011/12	1,216	182	1,032	0	0	0.5	0.0	1.8	1,214
2012/13	1,183	155	1,028	0	0	0.5	0.0	0.9	1,182
2013/14	1,275	201	1,074	0	0	0.4	0.0	0.2	1,275
2014/15	1,374	207	1,166	0	0	0.4	0.0	0.7	1,373
2015/16	1,320	243	1,077	0	0	0.4	0.0	1.3	1,319
2016/17	1,194	210	984	0	0	0.3	0.0	4.4	1,189
2017/18	1,410	182	1,228	0	0	0.3	0.0	4.7	1,405
FORECAST:									
2018/19	1,344	165	1,178	0	0	0.2	0	0.7	1,343
2019/20	1,346	149	1,197	0	0	0.4	0	1.4	1,344
2020/21	1,255	40	1,215	0	0	0.6	0	2.1	1,252
2021/22	1,273	40	1,233	0	0	0.8	0	2.8	1,269
2022/23	1,328	41	1,287	0	0	1.0	0	3.6	1,324
2023/24	1,348	41	1,306	0	0	1.1	0	4.4	1,342
2024/25	1,372	42	1,330	0	0	1.3	0	5.1	1,366
2025/26	1,351	0	1,351	0	0	1.5	0	5.8	1,344
2026/27	1,374	0	1,374	0	0	1.6	0	6.5	1,366
2027/28	1,390	0	1,390	0	0	1.8	0	7.2	1,381

Notes:

Represents total of OUC and St. Cloud. Peak demands may not match other schedules due to non-coincidence of OUC and St. Cloud peaks and/or rounding.

Historical "Residential Conservation" and "Comm/Ind. Conservation" represent annual demand reductions associated with new participants in OUC's DSM programs described in Section 5 of OUC's 2018 Ten-Year Site Plan.

Forecast "Residential Conservation" and "Comm/Ind. Conservation" represent cumulative annual demand reductions associated with new participants in OUC's DSM programs described in Section 5 of OUC's 2018 Ten-Year Site Plan.

2010/11 - 2012/13 "Wholesale" represent sales to City of Vero Beach.

2013/14-2017/18 "Wholesale" represents sales to City of Vero Beach, City of Winter Park, City of Lake Worth, and City of Bartow.

Forecast "Wholesale" include projected sales to City of Vero Beach, City of Winter Park, City of Lake Worth, City of Bartow, and Florida Power & Light.

Forecast "Net Firm Demand" may not exactly match up with peak demands presented in the 2019 OUC Ten-Year Site Plan due to coincidence and rounding.

ORLANDO UTILITIES COMMISSION
2019 TEN-YEAR SITE PLAN

Schedule 3.3
History and Forecast of Annual Net Energy for Load - GWH
Base Case

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Year	Total	Residential Conservation	Comm./Ind. Conservation	Retail	Wholesale	Utility Use & Losses	Net Energy for Load	Load Factor %
HISTORY:								
2009	6,253	0	0	6,031	0	223	6,253	57.4%
2010	6,785	3.01	5.8	6,030	469	277	6,776	58.2%
2011	6,983	2.7	3.0	6,021	768	188	6,977	58.2%
2012	7,074	1.9	7.3	5,955	764	346	7,065	58.2%
2013	7,072	1.9	4.5	6,025	769	272	7,065	57.2%
2014	7,526	1.8	1.0	6,191	1,000	332	7,523	57.3%
2015	8,136	0.8	13.4	6,537	1,317	268	8,122	57.3%
2016	7,992	1.2	12.3	6,601	1,100	278	7,979	55.4%
2017	7,934	0.8	31.0	6,568	1,032	302	7,902	55.3%
2018	8,033	0.8	34.7	6,769	1,040	189	7,998	59.4%
FORECAST:								
2019	7,735	0.6	0.8	6,752	674	307	7,733	56.7%
2020	7,750	1.3	1.6	6,838	581	328	7,747	56.6%
2021	7,509	2.1	2.4	6,914	257	334	7,504	59.5%
2022	7,732	2.9	3.0	7,109	259	358	7,727	58.5%
2023	7,912	3.6	3.8	7,261	262	382	7,905	59.0%
2024	8,016	4.3	4.7	7,353	265	389	8,007	59.0%
2025	8,119	4.8	5.5	7,448	267	394	8,109	59.0%
2026	7,957	5.4	6.3	7,547	0	398	7,945	58.6%
2027	8,068	6.0	7.1	7,652	0	403	8,055	58.5%
2028	8,188	6.6	7.9	7,765	0	408	8,173	58.5%

Notes:

Represents total of OUC and St. Cloud. NEL may not match other schedules due to rounding.

Historical "Residential Conservation" and "Comm/Ind. Conservation" represent annual demand reductions associated with new participants in OUC's DSM programs described in Section 5 of OUC's 2018 Ten-Year Site Plan.

Forecast "Residential Conservation" and "Comm/Ind. Conservation" represent cumulative annual demand reductions associated with new participants in OUC's DSM programs described in Section 5 of OUC's 2018 Ten-Year Site Plan.

Historical "Wholesale" includes power sales to Vero Beach in 2010 through 2014, and to Bartow in 2013 through 2018.

2010 - 2012 "Wholesale" represent sales to City of Vero Beach.

2013-2018 "Wholesale" represents sales to City of Vero Beach, City of Winter Park, City of Lake Worth, and City of Bartow.

Forecast "Wholesale" include projected sales to City of Vero Beach, City of Winter Park, City of Lake Worth, City of Bartow, and Florida Power & Light.

Schedule 4
Previous Year and 2-Year Forecast of Retail Peak Demand and Net Energy for Load by Month

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Month	2018 Actual		2019 Forecast		2020 Forecast	
	Peak Demand MW	NEL GWH	Peak Demand MW	NEL GWH	Peak Demand MW	NEL GWH
January	1,223	544	1,177	542	1,195	546
February	1,041	476	1,173	471	1,148	493
March	1,018	490	1,026	513	1,043	524
April	1,078	523	1,084	543	1,105	550
May	1,165	594	1,240	625	1,263	636
June	1,300	647	1,345	658	1,366	670
July	1,299	674	1,361	704	1,382	715
August	1,314	694	1,361	719	1,383	730
September	1,327	670	1,310	656	1,331	661
October	1,236	620	1,226	595	1,246	596
November	1,103	512	1,056	506	1,074	509
December	994	514	1,044	527	1,056	535

Notes:

Represents the total of OUC and St. Cloud retail peak demands and net energy for load. Wholesale sales are not included.
Peak demands may not match other schedules due to non-coincidence of OUC and St. Cloud peaks and/or rounding.

ORLANDO UTILITIES COMMISSION 2019 TEN-YEAR SITE PLAN

Schedule 5 Fuel Requirements

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Fuel Requirements		Units	Actual 2017	Actual 2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
(1)	Nuclear		Trillion BTU	5	4	5	5	5	5	5	5	5	5	5	5
(2)	Coal		1000 Ton	1,634	1,736	1,285	1,192	1,059	1,053	1,194	1,194	872	789	768	811
(3)	Residual	Total	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(4)		Steam	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(5)		CC	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(6)		CT	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(7)		Other	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(8)	Distillate	Total	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(9)		Steam	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(10)		CC	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(11)		CT	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(12)		Other	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(13)	Natural Gas	Total	1000 MCF	23,667	21,638	26,835	28,064	26,895	28,274	27,143	27,860	33,761	34,020	35,325	35,300
(14)		Steam	1000 MCF	1,080	28	2	2	2	2	2	2	2	2	2	2
(15)		CC	1000 MCF	22,351	21,385	26,637	27,851	26,795	28,190	26,879	27,596	33,688	33,919	35,190	35,162
(16)		CT	1000 MCF	236	225	196	211	98	82	262	262	71	98	133	136
(17)	Other (Specify)		Trillion BTU	0	0	0	0	0	0	0	0	0	0	0	0

Notes:

Represents fuel required to serve OUC and St. Cloud, and sales to wholesale customers.

Natural gas CC includes purchases from Stanton A PPA

ORLANDO UTILITIES COMMISSION
2019 TEN-YEAR SITE PLAN

Schedule 6.1
Energy Sources

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Energy Sources		Units	Actual 2017	Actual 2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
(1)	Firm Inter-Region Interchange		GWH	0	0	0	0	0	0	0	0	0	0	0	0
(2)	Nuclear		GWH	467	470	591	577	556	586	588	588	586	576	545	561
(3)	Coal		GWH	3,955	4,204	3,112	2,887	2,565	2,551	2,890	2,890	2,112	1,910	1,859	1,964
(4)	Residual	Total	GWH	0	0	0	0	0	0	0	0	0	0	0	0
(5)		Steam	GWH	0	0	0	0	0	0	0	0	0	0	0	0
(6)		CC	GWH	0	0	0	0	0	0	0	0	0	0	0	0
(7)		CT	GWH	0	0	0	0	0	0	0	0	0	0	0	0
(8)		Other	GWH	0	0	0	0	0	0	0	0	0	0	0	0
(9)	Distillate	Total	GWH	0	0	0	0	0	0	0	0	0	0	0	0
(10)		Steam	GWH	0	0	0	0	0	0	0	0	0	0	0	0
(11)		CC	GWH	0	0	0	0	0	0	0	0	0	0	0	0
(12)		CT	GWH	0	0	0	0	0	0	0	0	0	0	0	0
(13)		Other	GWH	0	0	0	0	0	0	0	0	0	0	0	0
(14)	Natural Gas	Total	GWH	3,326	3,138	3,823	3,998	3,839	4,037	3,862	3,965	4,822	4,857	5,041	5,037
(15)		Steam	GWH	114	68	5	5	5	5	5	5	5	5	5	5
(16)		CC	GWH	3,193	3,055	3,805	3,979	3,828	4,027	3,840	3,942	4,813	4,846	5,027	5,023
(17)		CT	GWH	19	15	13	14	7	5	17	17	5	7	9	9
(18)	NUG		GWH	0	0	0	0	0	0	0	0	0	0	0	0
(19)	Renewables	Total	GWH	154	185	207	284	544	552	565	565	589	602	610	611
(20)		Biofuels	GWH	0	0	0	0	0	0	0	0	0	0	0	0
(21)		Biomass	GWH	0	0	0	0	0	0	0	0	0	0	0	0
(22)		Hydro	GWH	0	0	0	0	0	0	0	0	0	0	0	0
(23)		Landfill Gas	GWH	142	157	181	191	194	203	216	216	243	256	265	265
(24)		MSW	GWH	0	0	0	0	0	0	0	0	0	0	0	0
(25)		Solar	GWH	12	28	26	93	350	349	348	348	346	346	345	345
(26)		Wind	GWH	0	0	0	0	0	0	0	0	0	0	0	0
(27)		Other	GWH	0	0	0	0	0	0	0	0	0	0	0	0
(28)	Other (Specify)		GWH	0	0	0	0	0	0	0	0	0	0	0	0
(29)	Net Energy for Load		GWH	7,902	7,997	7,733	7,745	7,504	7,727	7,905	8,007	8,110	7,944	8,054	8,173

Notes:

Represents GWh required to serve OUC and St. Cloud, and sales to wholesale customers.

Total Net Energy for Load may not correspond to other Schedules due to rounding.

Natural gas CC includes purchases from Stanton APPA

ORLANDO UTILITIES COMMISSION
2019 TEN-YEAR SITE PLAN

Schedule 6.2
Energy Sources

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Energy Sources		Units	Actual 2017	Actual 2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
(1)	Firm Inter-Region Interchange		%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
(2)	Nuclear		%	5.91%	5.88%	7.64%	7.45%	7.41%	7.59%	7.44%	7.35%	7.23%	7.25%	6.76%	6.87%
(3)	Coal		%	50.05%	52.57%	40.24%	37.27%	34.18%	33.01%	36.56%	36.09%	26.05%	24.04%	23.08%	24.03%
(4)	Residual	Total	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
(5)		Steam	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
(6)		CC	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
(7)		CT	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
(8)		Other	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
(9)	Distillate	Total	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
(10)		Steam	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
(11)		CC	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
(12)		CT	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
(13)		Other	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
(14)	Natural Gas	Total	%	42.09%	39.24%	49.44%	51.61%	51.16%	52.25%	48.86%	49.51%	59.46%	61.14%	62.58%	61.63%
(15)		Steam	%	1.44%	0.85%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%
(16)		CC	%	40.41%	38.20%	49.21%	51.37%	51.01%	52.12%	48.58%	49.23%	59.34%	61.00%	62.41%	61.46%
(17)		CT	%	0.24%	0.19%	0.17%	0.18%	0.09%	0.07%	0.22%	0.22%	0.06%	0.08%	0.11%	0.11%
(18)	NUG		%												
(19)	Renewables	Total	%	1.95%	2.31%	2.68%	3.66%	7.25%	7.15%	7.14%	7.05%	7.26%	7.57%	7.57%	7.47%
(20)		Biofuels	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
(21)		Biomass	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
(22)		Hydro	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
(23)		Landfill Gas	%	1.80%	1.96%	2.35%	2.46%	2.59%	2.63%	2.74%	2.70%	2.99%	3.22%	3.28%	3.25%
(24)		MSW	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
(25)		Solar	%	0.15%	0.35%	0.33%	1.20%	4.66%	4.52%	4.40%	4.35%	4.27%	4.35%	4.28%	4.23%
(26)		Wind	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
(27)		Other	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
(28)	Other (Specify)		%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
(29)	Net Energy for Load		%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Notes:

Represents GWh required to serve OUC and St. Cloud, and sales to wholesale customers.
Natural gas CC includes purchases from Stanton A PPA

ORLANDO UTILITIES COMMISSION
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Schedule 7.1
Forecast of Capacity, Demand, and Scheduled Maintenance at Time of Summer Peak

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Year	Total Installed Capacity MW	Firm Capacity Import MW	Firm Capacity Export MW	QF MW	Total Capacity Available MW	System Firm Summer Peak Demand MW	Reserve Margin before Maintenance MW	% of Peak	Scheduled Maintenance MW	Reserve Margin after Maintenance MW	% of Peak
FORECAST:											
2019	1,508	369	0	0	1,877	1,557	320	22%	0	320	22%
2020	1,529	369	0	0	1,898	1,562	336	23%	0	336	23%
2021	1,529	424	0	0	1,954	1,440	514	37%	0	514	37%
2022	1,529	424	0	0	1,954	1,507	446	30%	0	446	30%
2023	1,529	424	0	0	1,954	1,529	425	29%	0	425	29%
2024	1,529	424	0	0	1,954	1,549	405	27%	0	405	27%
2025	1,529	424	0	0	1,954	1,570	384	25%	0	384	25%
2026	1,529	424	0	0	1,954	1,549	405	26%	0	405	26%
2027	1,529	424	0	0	1,954	1,571	383	24%	0	383	24%
2028	1,529	424	0	0	1,954	1,596	358	22%	0	358	22%

Notes:

"Firm Capacity Import" includes OUC's existing and future power purchase agreements, including renewables.

"System Firm Summer Peak Demand" includes OUC and St. Cloud peak demand, as well as OUC's wholesale power sales.

"Reserve Margin (MW)" calculated as available capacity minus "System Firm Summer Peak Demand."

"Reserve Margin (% of Peak)" calculated as "Reserve Margin (MW)" divided by "System Firm Summer Peak Demand." OUC's agreement with LWU already includes reserve calculations and OUC does not carry reserves under the Winter Park or Bartow agreements.

"Scheduled Maintenance (MW)" is zero, as no units are scheduled for maintenance during peak periods.

ORLANDO UTILITIES COMMISSION
2019 TEN-YEAR SITE PLAN

Schedule 7.2
Forecast of Capacity, Demand, and Scheduled Maintenance at Time of Winter Peak

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Year	Total Installed Capacity MW	Firm Capacity Import MW	Firm Capacity Export MW	QF MW	Total Capacity Available MW	System Firm Winter Peak Demand MW	Reserve Margin before Maintenance MW	% of Peak	Scheduled Maintenance MW	Reserve Margin after Maintenance MW	% of Peak
FORECAST:											
2018/19	1,548	368	0	0	1,916	1,343	573	46%	0	573	46%
2019/20	1,556	368	0	0	1,924	1,344	579	46%	0	579	46%
2020/21	1,570	368	0	0	1,937	1,252	685	57%	0	685	57%
2021/22	1,570	368	0	0	1,937	1,269	668	54%	0	668	54%
2022/23	1,570	368	0	0	1,937	1,324	614	48%	0	614	48%
2023/24	1,570	368	0	0	1,937	1,342	595	46%	0	595	46%
2024/25	1,570	368	0	0	1,937	1,366	572	43%	0	572	43%
2025/26	1,570	368	0	0	1,937	1,344	593	44%	0	593	44%
2026/27	1,570	368	0	0	1,937	1,366	572	42%	0	572	42%
2027/28	1,570	368	0	0	1,937	1,381	556	40%	0	556	40%

Notes:

"Firm Capacity Import" includes OUC's existing and future power purchase agreements, including renewables.

"System Firm Summer Peak Demand" includes OUC and St. Cloud peak demand, as well as OUC's wholesale power sales.

"Reserve Margin (MW)" calculated as available capacity minus "System Firm Summer Peak Demand."

"Reserve Margin (% of Peak)" calculated as "Reserve Margin (MW)" divided by "System Firm Summer Peak Demand." OUC's agreement with LWU already includes reserve calculations and OUC does not carry reserves under the Winter Park or Bartow agreements.

"Scheduled Maintenance (MW)" is zero, as no units are scheduled for maintenance during peak periods.

**ORLANDO UTILITIES COMMISSION
2019 TEN-YEAR SITE PLAN**

**Schedule 8
Planned and Prospective Generating Facility Additions and Changes**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Plant Name	Unit No.	Location	Unit Type	Fuel		Fuel Transport		Const. Start Mo/Yr	Commercial In-Service Mo/Yr	Expected Retirement Mo/Yr	Gen. Max. Nameplate KW	Net Capability		Status
				Pri	Alt	Pri	Alt					Summer MW	Winter MW	
Stanton Energy Center	1	Orange	ST	BIT	N/A	RR	N/A	-	04/20	-	464,500	20	20	P
Stanton Energy Center	2	Orange	ST	BIT	N/A	RR	N/A	-	10/19	-	464,500	10	10	P

Notes:

Changes to Net Capability for Stanton Energy Center Units 1 and 2 represent increased output for the entire units, not just for OUC's ownership shares.

Schedule 9
Status Report and Specifications of Proposed Generating Facilities

- (1) Plant Name and Unit Number:
- (2) Capacity
 - a. Summer:
 - b. Winter:
- (3) Technology Type:
- (4) Anticipated Construction Timing
 - a. Field construction start-date:
 - b. Commercial in-service date:
- (5) Fuel
 - a. Primary fuel:
 - b. Alternate fuel:
- (6) Air Pollution Control Strategy:
- (7) Cooling Method:
- (8) Total Site Area:
- (9) Construction Status:
- (10) Certification Status:
- (11) Status with Federal Agencies:
- (12) Projected Unit Performance Data
 - Planned Outage Factor (POF):
 - Forced Outage Factor (FOF):
 - Equivalent Availability Factor (EAF):
 - Resulting Capacity Factor (%):
 - Average Net Operating Heat Rate (ANOHR):
- (13) Projected Unit Financial Data
 - Book Life (Years):
 - Total Installed Cost (In-Service Year \$/kW):
 - Direct Construction Cost (\$/kW):
 - AFUDC Amount (\$/kW):
 - Escalation (\$/kW):
 - Fixed O&M (\$/kW-Yr):
 - Variable O&M (\$/MWH):
 - K Factor:

Notes:

As discussed through OUC's 2019 Ten-Year Site Plan, OUC is projected to have sufficient capacity to maintain a 15% reserve margin for the 2019 through 2028 period. As such, there are no proposed generating facilities to include in this schedule.

Schedule 10
Status Report and Specifications of Proposed Directly Associated Transmission Lines

- (1) Point of Origin and Termination:
- (2) Number of Lines:
- (3) Right-of-Way:
- (4) Line Length:
- (5) Voltage:
- (6) Anticipated Construction Timing:
- (7) Anticipated Capital Investment:
- (8) Substations:
- (9) Participation with Other Utilities:

Notes:

OUC's 2019 Ten-Year Site Plan does not include any directly proposed transmission lines. Therefore, Schedule 10 is not applicable.