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April 9, 2021

ELECTRONIC FILING

Mr. Adam J. Teitzman, Commission Clerk
Office of Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850

Re: Docket 20210034-EI, Petition for Rate Increase by Tampa Electric Company

Dear Mr. Teitzman:

Attached for filing on behalf of Tampa Electric Company in the above-referenced docket is the Direct Testimony and Exhibit of Jose A. Aponte.

Thank you for your assistance in connection with this matter.

(Document 7 of 34)

Sincerely,

J. Jeffry Wahlen

JJW/ne
Attachment

cc: Richard Gentry, Public Counsel
Jon Moyle, FIPUG

BEFORE THE

FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 20210034-EI

IN RE: PETITION FOR RATE INCREASE

BY TAMPA ELECTRIC COMPANY

DIRECT TESTIMONY AND EXHIBIT

OF

JOSE A. APONTE

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

PREPARED DIRECT TESTIMONY

OF

JOSE A. APONTE

Q. Please state your name, address, occupation, and employer.

A. My name is Jose A. Aponte. My business address is 702 N. Franklin Street, Tampa, Florida 33602. I am employed by Tampa Electric Company ("Tampa Electric" or "company") as the Manager of Resource Planning.

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

A. My responsibilities include identifying the need for future resource additions and analyzing the economic and operational impacts to Tampa Electric's system.

Q. Have you previously testified before the Florida Public Service Commission ("Commission")?

A. Yes. I submitted written direct testimony in Docket Nos. 20190136-EI and 20200064-EI regarding the company's Third and Fourth SoBRA projects and have also presented to the

Commission during the Ten-Year Site Plan Workshop.

Q. How does your job impact the experience Tampa Electric provides to its customers?

A. Although I rarely have direct contact with our customers, my main responsibility in Resource Planning is to ensure that the additions we make to our electric generating portfolio are needed and are cost-effective, which in the long run helps ensure that the rates we charge our customers are fair, just, and reasonable.

Q. Please provide a brief outline of your educational background and business experience.

A. I graduated from the University of South Florida with a bachelor's degree and a master's degree in Mechanical Engineering. I am a registered Project Management Professional ("PMP").

I started work with Tampa Electric in 1999 as an engineer in the Inventory Management and Supply Chain Logistics department. In 2004, I became supervisor for the Materials and Quality Assurance department at the Big Bend Power Station. Since 2008, I have held several positions in the

Resource Planning department at Tampa Electric and currently serve as the Manager of Resource Planning.

I have twenty years of electric utility experience working in the areas of planning, systems integration, data analytics, revenue requirements, project economic analysis, and engineering.

Q. What are the purposes of your direct testimony?

A. The purposes of my direct testimony are to (1) generally discuss the company's plans to add an additional 600 MW of utility-scale solar generating capacity to our system ("Future Solar"), (2) demonstrate that the Future Solar projects are cost-effective, both individually and collectively, and (3) explain why the Future Solar is needed, will benefit customers, and is prudent.

Q. Have you prepared an exhibit to support your direct testimony?

A. Yes. My Exhibit No. JAA-1, entitled "Exhibit of Jose A. Aponte," was prepared under my direction and supervision. The contents of my exhibit were derived from the business records of the company and are true and correct to the best

of my information and belief. It consists of nine documents, as follows.

Document No. 1	Demand and Energy Forecast
Document No. 2	Fuel Price Forecast
Document No. 3	Future Solar Projects Cost-Effectiveness Test (Preliminary Analysis)
Document No. 4	Future Solar Projects Revenue Requirements (Preliminary Analysis)
Document No. 5	Future Solar Individual Project Costs per kW_{ac}
Document No. 6	Future Solar Projects Cost-Effectiveness Test (Current ROE)
Document No. 7	Future Solar Projects Revenue Requirements (Current ROE)
Document No. 8	Future Solar Projects Cost-Effectiveness Test (Rate Case ROE)
Document No. 9	Future Solar Projects Revenue Requirements (Rate Case ROE)

Q. Are you sponsoring any sections of Tampa Electric's Minimum Filing Requirements ("MFR") schedules?

A. No.

Q. How does your testimony relate to the testimony of other Tampa Electric witnesses?

A. Tampa Electric witness David A. Pickles explains how the company's proposed Future Solar fits into the company's plans for its generating portfolio.

Tampa Electric witness C. David Sweat explains the details of the 11 individual projects that are underway as part of our plan to build Future Solar. He describes the location, size, timing, and projected costs of each of the projects.

My direct testimony shows that our proposed Future Solar projects are cost effective, needed, and prudent.

The investments and operation and maintenance ("O&M") expenses associated with the first 226.5 MW of additional solar are reflected in the MFR schedules for the company's proposed 2022 test year, which are jointly sponsored by Tampa Electric witness A. Sloan Lewis and Mr. Sweat.

Tampa Electric witness Jeffrey S. Chronister presents the company's proposal for recovering the investments and expenses associated with the remaining 373.5 MW of Future Solar in 2023 and 2024 in his testimony.

TAMPA ELECTRIC'S PLAN FOR FUTURE SOLAR

Q. Please describe the company's existing solar generating facilities.

A. Tampa Electric currently owns and operates 655 MW of solar generating capacity at 13 geographically dispersed locations throughout its service territory.

Our solar portfolio includes 632.1 MW of both single axis tracking and fixed tilt PV solar at 10 sites in Hillsborough and Polk Counties, a 1.6 MW fixed tilt solar PV rooftop canopy array located at the south parking garage at Tampa International Airport, a 1.4 MW fixed tilt solar PV ground canopy array located at Lego Land Florida, and a 19.8 MW single axis tracking solar station coupled with a 12.6 MW battery storage unit located at Big Bend Station ("Big Bend").

600 MW of this capacity was installed pursuant to the company's 2017 Amended and Restated Stipulation and Settlement Agreement ("2017 Agreement"). We began deploying utility scale solar generation in 2013.

Our solar facilities now produce enough electricity to power more than 100,000 homes, and in 2020, about six

percent of our energy was produced from the sun.

As noted in the direct testimony of Mr. Pickles, our first approximately 655 MW of solar is part of the transformation of our generating fleet. It also reflects our belief in the value of renewable energy and our long-standing commitment to clean energy. The Future Solar we are proposing in this case will further the transformation of our generating fleet and enable the company to be cleaner and greener, and emit less carbon, through projects that are cost-effective for all of our customers.

When we complete our Future Solar projects, nearly 14 percent of our energy will be from solar. This cost-effective long term energy solution will be enough to power more than 200,000 homes, and will promote price stability for customers, increase our fuel diversity, and reduce carbon emissions.

Q. Please generally describe the company's plans to build Future Solar.

A. Tampa Electric plans to add an additional 600 MW of utility-scale solar PV projects across its service territory by 2023. The company will build the projects in

three tranches: 226.5 MW in-service by December 1, 2021, 224 MW in-service by December 1, 2022, and 149.5 MW in-service by December 1, 2023.

Our Future Solar projects will be general system resources, not dedicated to a subset of solar energy subscribers and, therefore, their benefits will inure to all of our customers.

Q. Do you have a list of the Future Solar projects by tranche and their projected cost in dollars per kW_{ac}?

A. Yes. The list of projects by tranche and projected cost in dollars per kW_{ac} is shown below in Document No. 3 of my exhibit. The projected costs, excluding Allowance for Funds Used for Construction ("AFUDC"), were provided to me by Mr. Sweat, who explains the costs and project schedules in his direct testimony. I added the AFUDC amounts to the project costs to arrive at the total project costs shown in Document No. 3 of my exhibit.

Q. How were the AFUDC amounts included in your project costs per kW_{ac} determined?

A. Mr. Sweat's capital spending was provided to the company's

accounting team, who then calculated the AFUDC per project. These AFUDC costs were provided to me and included in the cost-effectiveness calculations.

Q. How do the projected costs for these Future Solar projects compare to the cost of the 600 MW of SoBRA solar approved pursuant to the 2017 Agreement?

A. The Future Solar project costs are lower than those of the SoBRA projects due to improvements in module efficiency and reduced module pricing. As modules become more efficient, the balance of system cost is also reduced on a per megawatt basis. Additionally, more efficient modules allow us to construct more solar capacity on a per acre basis, reducing overall project costs. Tampa Electric also procured inverters, tracking systems, and Generator Step-up Unit ("GSU") transformers directly from suppliers to maximize economies of scale, reduce contractor markups, and secure a full 26 percent investment tax credit for all 600 megawatts of these future solar projects.

COST-EFFECTIVENESS OF FUTURE SOLAR

Q. Are the planned solar PV projects cost-effective?

A. Yes. The Future Solar projects are cost-effective in total,

by tranche, and on an individual project basis.

Q. Please describe the analyses Tampa Electric performed to evaluate the cost-effectiveness of the Future Solar projects?

A. The company prepared a preliminary analysis to ensure there was a business case for moving forward and followed that up with a second, more detailed, project-specific analysis. In both analyses, we evaluated cost-effectiveness based on whether or not the projects would lower the company's projected system cumulative present value revenue requirement ("CPVRR") as compared to such CPVRR without the solar projects. As part of the analyses, we modeled the annual revenue requirement associated with operating our system over a 30-year period with and without the proposed additions and used those annual amounts to calculate the CPVRR with and without the proposed additions.

We performed these analyses using our Integrated Resource Planning models to prepare a base case scenario without the Future Solar. We then prepared change case scenarios for the 600 MW in total, each annual tranche in total, and for each individual project, and compared the change cases

to the base case. The base case and change cases used production cost modeling software to determine system CPVRR, including fuel costs and variable O&M, and then the costs associated with a change case were subtracted from the base case to determine the savings. This technique is widely used by electric utilities during the development of integrated resource plans to evaluate whether to make additions to the generating portfolio.

Q. How did the company's detailed cost-effectiveness analysis differ from the preliminary screening analysis?

A. We prepared our preliminary analysis using an average cost of $1,385 per kW_{ac}, including AFUDC for all projects, and evaluated the Future Solar by tranche and in total. We prepared our more detailed second analysis using the forecasted project-specific costs provided by Mr. Sweat, and evaluated cost-effectiveness for the 600 MW in total, by tranche, and by project.

Our screening analysis indicated that the Future Solar was cost effective in total and by tranche, thus providing a basis for the company to continue moving forward with its efforts towards a lower carbon future. The more detailed analysis demonstrates that the Future Solar is cost-

effective in total, by tranche, and by project.

Q. Please explain the assumptions underlying the company's cost-effectiveness calculations.

A. The primary assumptions for the cost-effectiveness calculations are the company's Demand and Energy Forecast, the fuel price forecast, and the projected revenue requirements of the Future Solar projects.

We prepared our cost-effectiveness analyses with the Demand and Energy Forecast used to prepare Tampa Electric's 2020 cost recovery factors and its 2020 Ten Year Site Plan. A summary of the values in the Demand and Energy Forecast is shown in Document No. 1 of my exhibit.

The company prepared the fuel forecast using the same methodology the company has used to develop its fuel price forecast each year over the last decade, and it is shown in Document No. 2 of my exhibit.

Q. How did the company calculate the annual revenue requirements used in the two analyses?

A. In our preliminary analysis, we used an average cost of

$1,385 per kW_{ac}, including AFUDC, to calculate the revenue requirement for the 600 MW of Future Solar in total and then by tranche. In our second analysis, we used project-specific projected costs to calculate a revenue requirement by project, by tranche, and in total. Document Nos. 4 and 7 of my exhibit reflect the revenue requirements used in our preliminary and second cost-effectiveness analyses.

In both analyses, we used the capital structure and return guidelines and standards in our 2017 Agreement, because those guidelines and standards were in effect when we performed our original analyses, and because it is difficult to predict the return on equity and equity ratio that will be approved in this case. Consistent with the guidelines in the 2017 Agreement, we updated the long-term debt rate to 4.8 percent to reflect the prospective long-term debt issuances during the first 12 months of operations of the projects. The investment tax credits associated with the utility-scale solar projects were normalized over the 30-year life of the assets in accordance with applicable Internal Revenue Service regulations. Our revenue requirement calculation included reasonable estimates for O&M expenses (based on our experience with our 600 MW of SoBRA solar), depreciation expense, and property taxes, including the projected impact

of the property tax exemption for solar projects.

Q. Did the company consider allowance for funds used during construction ("AFUDC") and avoided carbon emission costs when calculating the revenue requirements described above?

A. Yes. We calculated the revenue requirements with and without AFUDC and with and without avoided carbon emission costs.

Q. By how much will the Future Solar projects lower the company's carbon emissions?

A. The 600 MW of Future Solar will decrease carbon dioxide ("CO_2") emissions by over 550 thousand tons per year and decrease nitrogen oxide ("NO_X") and sulfur dioxide ("SO_2") emissions by hundreds of tons.

Q. How did the company estimate the avoided cost of carbon emissions for the Future Solar projects?

A. Tampa Electric has been monitoring forecasted carbon prices since the draft Clean Power Plan was issued and contracted with a global consulting services company, ICF International, Inc., to obtain a CO_2 forecast that utilized

the most current assumptions and market conditions. The consultant compared projections for various regions of the country and included low, medium, and high cost of carbon forecasts.

Q. Is it reasonable to include the value of avoided carbon emission costs in the company's cost-effectiveness tests?

A. Yes. Although our federal government and the State of Florida do not currently impose a tax or fee on carbon emissions, public policy consideration and customer expectations in the United States and around the world are trending against carbon emissions and in favor of renewable energy like solar generation. It is difficult to predict whether the company will face a carbon tax or fee in the future, but it is even more difficult to completely rule out that possibility. Accordingly, it is reasonable to consider the value of avoided carbon costs when evaluating the cost-effectiveness of generating alternatives, including our Future Solar.

Q. Did the company consider the value of deferral in its cost-effectiveness analyses?

A. Yes. The company applied the long-standing, Commission-

accepted practice for including value of deferral. Specifically, we evaluated expansion plans for each project against our base expansion plan to determine if it had the ability to defer future capacity additions. Results of this evaluation showed that 10 of the projects had the ability to defer future battery storage additions, while one of the projects did not. The benefits for those projects that had value of deferral were included in the calculation of their respective total CPVRR.

Q. How much fuel expense will Future Solar allow the company's customers to avoid over the life of the projects?

A. Based on our base fuel forecast, we expect the Future Solar to save our customers approximately $739.4 million in fuel costs over the life of the projects.

Q. Please describe the results of the company's preliminary cost-effectiveness analysis.

A. Our preliminary analysis showed that Future Solar was cost effective in total and by tranche. Document No. 3 of my exhibit shows the results of our preliminary analysis in total and by tranche.

For Future Solar in total, the CPVRR differential was favorable for customers by $73.0 million before including any value for reduced emissions. Including reduced emissions benefits increased the CPVRR savings from Future Solar to $122.5 million.

The CPVRR savings for Future Solar by tranche were $22.4 million (Tranche One), $39.1 million (Tranche Two), and $11.6 million (Tranche Three) before including any value for reduced emissions. Including reduced emissions benefits increased the CPVRR savings from Future Solar to $35 million (Tranche One), $58 million (Tranche Two), and $29.5 million (Tranche Three).

Q. Please describe the results of the company's second cost-effectiveness analysis.

A. Our second analysis showed that Future Solar was cost effective in total, by tranche, and by project. Document No. 6 of my exhibit shows the results of our second analysis.

For Future Solar in total, the CPVRR differential in our second analysis was favorable for customers by $122.2 million before including any value for reduced emissions.

Including reduced emissions benefits increased the CPVRR savings from Future Solar to $171.5 million.

The CPVRR savings for Future Solar by tranche in our second analysis were $55.7 million (Tranche One), $45.1 million (Tranche Two), and $21.3 million (Tranche Three) before including any value for reduced emissions. Including reduced emissions benefits increased the CPVRR savings from Future Solar to $74.9 million (Tranche One), $63.5 million (Tranche Two), and $33.1 million (Tranche Three).

As shown on Document No. 6 of my exhibit, each individual project shows a CPVRR savings ranging from $1.5 to $30.9 million per project without carbon, including avoided emissions costs increased the CPVRR savings for each of the projects and increased the range of savings from between $3.4 and $37.3 million per project.

Q. Did the company conduct sensitivity testing on the results of its cost-effectiveness analysis?

A. Yes. Tampa Electric tested the CPVRR savings calculated in its preliminary analysis using high and low fuel price forecasts. The high and low fuel forecasts were prepared contemporaneously with the base fuel forecast. The results

show that customer savings occur under the base case and high fuel forecast sensitivities.

The company also recalculated the revenue requirements for the individual Future Solar projects using a 10.75 percent return on equity and a 55 percent equity ratio as proposed by the company in this case. Using these inputs, and excluding avoided carbon costs, our proposed Future Solar yields CPVRR savings to customers in total and by tranche, with ten of the eleven individual projects showing CPVRR savings ranging from $73.0 thousand to $25.9 million, and the remaining one indicating a minimal incremental CPVRR cost. When a conservative carbon costs forecast is included, all Future Solar projects at 10.75 percent return on equity and 55 percent equity ratio are cost effective. This analysis is shown on Document No. 8 of my exhibit.

NEED FOR FUTURE SOLAR

Q. Are the solar projects needed to provide service to Tampa Electric customers?

A. Yes. Tampa Electric expects demand to increase at an average annual rate of 1.2 percent in the summer and 1.3 percent in the winter. Retail energy sales are projected to rise at a 1.1 percent annual rate. Thus, the company

must plan to meet the power needs of its customers through additional resources and seeks to do so in cost-effective ways that use cleaner, greener, and lower carbon emitting assets. The company's proposed Future Solar aligns well with this goal, producing savings for customers and enhancing the company's environmental stewardship.

Q. Why does Tampa Electric need the Future Solar projects?

A. Tampa Electric needs the Future Solar projects to promote fuel diversity and price stability for our customers, and to respond to the growing demand for solar from our customers. Our proposed Future Solar does not contribute to our winter reserve margin because the projects do not provide capacity at the time of day our coincident winter peak occurs. Our Future Solar will, however, improve our summer reserve margin every year until the Future Solar projects are retired, and is part of our plan to use renewable energy resources and technology to the extent they are available, as contemplated in Section 403.519, Florida Statutes.

Q. Why is 600 MW the right amount of utility-scale solar to add to its system?

A. 600 MW of additional solar generating capacity is the amount of solar that can be added to our system without adding equipment and controls to our transmission and distribution system to accommodate the intermittent nature of solar. Adding 600 MW of zero emissions, cost-effective solar is prudent and is also the component of our generation expansion plan that allows us to maximize fuel diversity, price savings, fuel savings, and other benefits for our customers without incurring system upgrade costs.

Q. Why is it prudent for Tampa Electric to add 600 MW of utility-scale solar in the next three years?

A. Adding the Future Solar projects as planned helps to optimize our generation expansion plans and will allow our customers to enjoy the benefits of the incremental solar capacity as soon as reasonably possible. As Mr. Sweat explains further in his testimony, adding the Future Solar to our system as proposed will allow the company to maximize economies of scale in the procurement and construction of the projects.

Q. How will the Future Solar promote Tampa Electric's fuel diversity?

A. As projected for 2021, Tampa Electric's generation mix is expected to be approximately 87 percent natural gas, about eight percent solar (no fuel), and about five percent coal.

When we complete our Future Solar projects by the end of 2023, over 14 percent of our energy will be from solar which reduces our reliance on natural gas. Tampa Electric witness John C. Heisey discusses how adding solar generating capacity to our system has reduced, and will continue to reduce, our need to maintain high inventory levels of solid fuel.

Q. How will the Future Solar projects promote price stability for Tampa Electric's customers?

A. The prices we pay for the coal, natural gas, and oil burned in our power plants vary over time. In the case of natural gas, commodity prices can become quite volatile in a short period of time.

The "fuel" for solar generation is the sun, which is free, so once installed, the cost of generating solar energy remains constant and does not vary due to fuel cost fluctuations. Future Solar will increase the percentage of

our generating capacity that has no fuel cost, will effectively mitigate fossil fuel cost variability, and therefore, will help promote price stability for our customers.

Q. Is customer demand for solar energy growing?

A. Yes, we believe it is. Tampa Electric witness Melissa L. Cosby discusses this topic in her direct testimony.

Q. Can Tampa Electric use conservation measures as a substitute for the energy that will be provided by its proposed Future Solar?

A. No. These future solar projects are needed after all the Commission approved cost-effective energy efficiency measures are accounted for. As the company demonstrated in the most recent 2020-2029 Demand Side Management ("DSM") Goals proceeding, Florida Building Codes are becoming more stringent and various Federal energy efficiency and appliance standards have been enacted, which are affecting several baseline measures used for the evaluation of potential DSM measures. This reduction of potential savings as related to the baseline will further reduce the amount of energy efficiency that is available to be obtained

through cost-effective DSM programs in the future. It is important to note that in this last DSM Goals proceeding, the company proposed DSM Goals that were 14.3 percent higher than what was approved for the 2015-2024 period. In addition, Tampa Electric continues to be a recognized leader in offering cost-effective DSM programs. The company offers more DSM programs than any other utility in Florida. The design of our comprehensive DSM portfolio ensures that all customers, particularly low-income customers, have opportunities to participate. Tampa Electric and its customers have realized significant savings from the DSM programs offered since the inception of DSM in Florida in 1980. These DSM programs have saved 1,722 GWh of annual energy, but additional DSM programs will not substitute for the zero-fuel cost energy to be provided from our Future Solar projects.

Q. Will Future Solar provide other benefits to Tampa Electric's customers and the communities where they live?

A. Yes. Because it does not burn fuel or have moving parts that operate under high temperatures and pressures, solar generation is safer to operate than fossil fuel-burning generators.

Not only is solar emission-free, it doesn't use ground water nor create wastewater – better for the precious underground aquifer and Florida waterways.

As noted in the testimony of Mr. Pickles, our Future Solar projects will require fewer financial resources to operate than fossil fuel-burning plants and will substitute, in part, for operation of solid fuel generating assets that cost more to operate and maintain, which will allow the company to incur less O&M expense.

Construction of the Future Solar projects will create new construction jobs in this area, which will help our local economies.

The solar projects will also generate new property tax revenues for the local governments where they are located.

Q. Is the company's plan for Future Solar prudent?

A. Yes. As noted in the testimony of Mr. Sweat, the company has planned and will be constructing the 11 Future Solar projects at the lowest reasonable cost, and I have shown that our proposed Future Solar projects are cost-effective. We need Future Solar to promote alternative sources of

energy that can be key to system reliability and resiliency, improve fuel diversity, provide price stability, and respond to growing customer demand for solar. Our planned solar additions are safe, will require fewer financial resources to operate than fossil fuel-burning plants, and will substitute, in part, for operation of solid fuel generating assets that cost more to operate and maintain, which will allow the company to incur less O&M expense.

SUMMARY

Q. Please summarize your direct testimony.

A. My testimony describes the company's plans to add additional 600 MW of utility-scale solar generating capacity to our system; demonstrates that the Future Solar projects are cost-effective, both individually and collectively; and demonstrates that the Future Solar is needed, will benefit customers, and is prudent.

The CPVRR savings for Future Solar by tranche are $55.7 million (Tranche One), $45.1 million (Tranche Two), and $21.3 (Tranche Three) before including any value for reduced emissions. Including reduced emissions benefits increased the CPVRR savings from Future Solar to $74.9 million (Tranche One), $63.5 million (Tranche Two), and

$33.1 million (Tranche Three). Taken individually, the CPVRR for each of the 11 projects was lower, with savings ranging between $1.5 and $30.9 million per project without carbon. Including avoided emissions costs increased the CPVRR savings for each of the projects and increased the range of savings to between $3.4 and $37.3 million per project.

Q. Does this conclude your direct testimony?

A. Yes, it does.

EXHIBIT

OF

JOSE A. APONTE

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Demand and Energy Forecast

	Winter (MW)	Summer (MW)	Energy (GWh)
2019	3,091	4,106	20,432
2020	4,384	4,148	20,497
2021	4,447	4,193	20,674
2022	4,505	4,242	20,882
2023	4,567	4,294	21,105
2024	4,628	4,344	21,338
2025	4,686	4,391	21,547
2026	4,738	4,435	21,738
2027	4,791	4,481	21,950
2028	4,844	4,530	22,181
2029	4,898	4,580	22,430
2030	4,953	4,628	22,674
2031	5,004	4,672	22,904
2032	5,052	4,718	23,138
2033	5,102	4,764	23,375
2034	5,152	4,812	23,621
2035	5,204	4,859	23,867
2036	5,251	4,903	24,103
2037	5,297	4,947	24,342
2038	5,343	4,992	24,584
2039	5,343	4,992	24,584
2040	5,343	4,992	24,584
2041	5,343	4,992	24,584
2042	5,343	4,992	24,584
2043	5,343	4,992	24,584
2044	5,343	4,992	24,584
2045	5,343	4,992	24,584
2046	5,343	4,992	24,584
2047	5,343	4,992	24,584
2048	5,343	4,992	24,584
2049	5,343	4,992	24,584

Fuel Price Forecast ($/MMBtu)

	Coal	Natural Gas
2019	3.21	3.04
2020	3.22	2.87
2021	3.27	2.80
2022	3.28	2.93
2023	3.32	3.14
2024	3.46	3.33
2025	3.60	3.63
2026	3.73	4.01
2027	3.86	4.28
2028	3.99	4.51
2029	4.14	4.69
2030	4.28	4.85
2031	4.43	5.00
2032	4.60	5.19
2033	4.77	5.40
2034	4.94	5.62
2035	5.12	5.85
2036	5.31	6.13
2037	5.50	6.39
2038	5.71	6.64
2039	5.92	6.93
2040	6.13	7.30
2041	6.27	7.57
2042	6.44	7.82
2043	6.63	8.10
2044	6.84	8.44
2045	7.05	8.76
2046	7.25	9.06
2047	7.47	9.40
2048	7.74	9.87
2049	8.02	10.09

Future Solar Projects Cost-Effectiveness (Preliminary)
600 MW of Solar - 150/225/225 MW

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($64.1)
Capital RR - Solar New Arrays (w/Interconnect)	$586.2
RR of Land for Solar	$81.0
System VOM	($34.0)
FOM - Other Future Units	($8.8)
FOM - Solar Future Arrays	$84.1
System Fuel	($717.4)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($73.0)
Plus Emissions Costs	
CO2 - Base	($49.2)
CO2 - High	($174.6)
CO2 - Low	$0.0
NOX - Base	($0.2)
Total w/ CO2 (Base) & NOX Cost	($122.5)
Total w/ CO2 (High) & NOX Cost	($247.9)
Total w/ CO2 (Low) & NOX Cost	($73.3)

Future Solar Projects Cost-Effectiveness (Preliminary)
150 MW of Solar – Tranche 1

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($14.7)
Capital RR - Solar New Arrays (w/Interconnect)	$158.9
RR of Land for Solar	$21.9
System VOM	($11.4)
FOM - Other Future Units	($1.5)
FOM - Solar Future Arrays	$22.3
System Fuel	($197.8)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($22.4)
Plus Emissions Costs	
CO2 - Base	($12.6)
CO2 - High	($44.6)
CO2 - Low	$0.0
NOX - Base	($0.1)
Total w/ CO2 (Base) & NOX Cost	($35.0)
Total w/ CO2 (High) & NOX Cost	($67.1)
Total w/ CO2 (Low) & NOX Cost	($22.4)

Future Solar Projects Cost-Effectiveness (Preliminary)
225 MW of Solar - Tranche 2

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($28.5)
Capital RR - Solar New Arrays (w/Interconnect)	$225.3
RR of Land for Solar	$30.6
System VOM	($13.4)
FOM - Other Future Units	($5.5)
FOM - Solar Future Arrays	$31.9
System Fuel	($279.5)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($39.1)
Plus Emissions Costs	
CO2 - Base	($18.8)
CO2 - High	($66.6)
CO2 - Low	$0.0
NOX - Base	($0.1)
Total w/ CO2 (Base) & NOX Cost	($58.0)
Total w/ CO2 (High) & NOX Cost	($105.8)
Total w/ CO2 (Low) & NOX Cost	($39.2)

Future Solar Projects Cost-Effectiveness (Preliminary)
225 MW of Solar - Tranche 3

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($20.9)
Capital RR - Solar New Arrays (w/Interconnect)	$202.0
RR of Land for Solar	$28.5
System VOM	($9.3)
FOM - Other Future Units	($1.8)
FOM - Solar Future Arrays	$30.0
System Fuel	($240.0)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($11.6)
Plus Emissions Costs	
CO2 - Base	($17.8)
CO2 - High	($63.3)
CO2 - Low	$0.0
NOX - Base	($0.1)
Total w/ CO2 (Base) & NOX Cost	($29.5)
Total w/ CO2 (High) & NOX Cost	($75.0)
Total w/ CO2 (Low) & NOX Cost	($11.7)

Future Solar Projects Revenue Requirements (Preliminary)

150 MW of Solar

($000)	2021
Capital RR	21,596
FOM	1,636
Land RR	2,289
Total RR	25,521

225 MW of Solar

($000)	2022
Capital RR	32,733
FOM	2,507
Land RR	3,434
Total RR	38,674

225 MW of Solar

($000)	2023
Capital RR	33,295
FOM	2,563
Land RR	3,434
Total RR	39,292

FULL YEAR

600 MW of Solar

($000)	
Capital RR	87,625
FOM	6,706
Land RR	9,157
Total RR	103,488

Note: Values may not sum to total due to rounding.

Future Solar Projects Cost per kW_{ac}

	MW	Projected $ per kW_{ac}
Magnolia Solar	74.5	1,244
Big Bend II Solar	25	1,352
Mountain View Solar	52.5	1,426
Jamison Solar	74.5	1,400
Total in-service Dec 2021	226.5	1,350
Laurel Oaks Solar	66.8	1,268
Riverside Solar	65	1,336
Big Bend III Solar	22.2	1,275
Palm River Dairy Solar	70	1,234
Total in-service Dec 2022	224	1,278
Alafia Solar	50	1,382
Wheeler Solar	74.5	1,213
Dover Solar	25	1,375
Total in-service Dec 2023	149.5	1,296

Future Solar Projects Cost-Effectiveness Test (Current ROE)
600 MW of Solar - 226.5/224/149.5 MW

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR - Other New Units	($63.8)
Capital RR - Solar New Arrays (w/Interconnect)	$577.4
RR of Land for Solar	$61.6
System VOM	($34.4)
FOM - Other Future Units	($8.8)
FOM - Solar Future Arrays	$85.3
System Fuel	($739.4)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($122.2)
Plus Emissions Costs	
CO2 - Base	($49.1)
CO2 - High	($174.1)
CO2 - Low	$0.0
NOX - Base	($0.2)
Total w/ CO2 (Base) & NOX Cost	($171.5)
Total w/ CO2 (High) & NOX Cost	($296.5)
Total w/ CO2 (Low) & NOX Cost	($122.4)

Future Solar Projects Cost-Effectiveness Test (Current ROE)
226.5 MW of Solar - Tranche 1

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($23.8)
Capital RR - Solar New Arrays (w/Interconnect)	$239.2
RR of Land for Solar	$23.3
System VOM	($15.8)
FOM - Other Future Units	($5.3)
FOM - Solar Future Arrays	$33.7
System Fuel	($307.0)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($55.7)
Plus Emissions Costs	
CO2 - Base	($19.1)
CO2 - High	($67.6)
CO2 - Low	$0.0
NOX - Base	($0.1)
Total w/ CO2 (Base) & NOX Cost	($74.9)
Total w/ CO2 (High) & NOX Cost	($123.5)
Total w/ CO2 (Low) & NOX Cost	($55.8)

Future Solar Projects Cost-Effectiveness Test (Current ROE)
224 MW of Solar - Tranche 2

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($26.7)
Capital RR - Solar New Arrays (w/Interconnect)	$209.8
RR of Land for Solar	$20.1
System VOM	($12.8)
FOM - Other Future Units	($2.3)
FOM - Solar Future Arrays	$31.7
System Fuel	($265.0)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($45.1)
Plus Emissions Costs	
CO2 - Base	($18.3)
CO2 - High	($64.9)
CO2 - Low	$0.0
NOX - Base	($0.1)
Total w/ CO2 (Base) & NOX Cost	($63.5)
Total w/ CO2 (High) & NOX Cost	($110.1)
Total w/ CO2 (Low) & NOX Cost	($45.2)

Future Solar Projects Cost-Effectiveness Test (Current ROE)
149.5 MW of Solar - Tranche 3

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($13.3)
Capital RR - Solar New Arrays (w/Interconnect)	$128.4
RR of Land for Solar	$18.1
System VOM	($5.8)
FOM - Other Future Units	($1.2)
FOM - Solar Future Arrays	$19.9
System Fuel	($167.5)
System Capacity	$0.0
Sub Total w/o NO_X or CO_2 Cost	($21.3)
Plus Emissions Costs	
CO2 - Base	($11.7)
CO2 - High	($41.6)
CO2 - Low	$0.0
NOX - Base	($0.0)
Total w/ CO2 (Base) & NOX Cost	($33.1)
Total w/ CO2 (High) & NOX Cost	($62.9)
Total w/ CO2 (Low) & NOX Cost	($21.4)

Future Solar Projects Cost-Effectiveness Test (Current ROE)
Magnolia Solar - 74.5 MW

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($9.9)
Capital RR - Solar New Arrays (w/Interconnect)	$73.7
RR of Land for Solar	$5.6
System VOM	($4.6)
FOM - Other Future Units	($3.8)
FOM - Solar Future Arrays	$11.1
System Fuel	($103.1)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($30.9)
Plus Emissions Costs	
CO2 - Base	($6.3)
CO2 - High	($22.6)
CO2 - Low	$0.0
NOX - Base	($0.0)
Total w/ CO2 (Base) & NOX Cost	($37.3)
Total w/ CO2 (High) & NOX Cost	($53.5)
Total w/ CO2 (Low) & NOX Cost	($30.9)

Future Solar Projects Cost-Effectiveness Test (Current ROE)
Big Bend II Solar - 25 MW

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($1.9)
Capital RR - Solar New Arrays (w/Interconnect)	$28.6
RR of Land for Solar	$0.0
System VOM	($2.4)
FOM - Other Future Units	($0.2)
FOM - Solar Future Arrays	$3.7
System Fuel	($34.1)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($6.3)
Plus Emissions Costs	
CO2 - Base	($2.1)
CO2 - High	($7.4)
CO2 - Low	$0.0
NOX - Base	($0.0)
Total w/ CO2 (Base) & NOX Cost	($8.4)
Total w/ CO2 (High) & NOX Cost	($13.7)
Total w/ CO2 (Low) & NOX Cost	($6.3)

Future Solar Projects Cost-Effectiveness Test (Current ROE)
Mountain View Solar - 52.5 MW

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($8.2)
Capital RR - Solar New Arrays (w/Interconnect)	$56.9
RR of Land for Solar	$7.8
System VOM	($3.3)
FOM - Other Future Units	($1.0)
FOM - Solar Future Arrays	$7.8
System Fuel	($63.2)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($3.3)
Plus Emissions Costs	
CO2 - Base	($4.1)
CO2 - High	($14.7)
CO2 - Low	$0.0
NOX - Base	($0.0)
Total w/ CO2 (Base) & NOX Cost	($7.5)
Total w/ CO2 (High) & NOX Cost	($18.0)
Total w/ CO2 (Low) & NOX Cost	($3.3)

Future Solar Projects Cost-Effectiveness Test (Current ROE)
Jamison Solar - 74.5 MW

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($3.8)
Capital RR - Solar New Arrays (w/Interconnect)	$80.0
RR of Land for Solar	$9.9
System VOM	($5.5)
FOM - Other Future Units	($0.3)
FOM - Solar Future Arrays	$11.1
System Fuel	($106.6)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($15.3)
Plus Emissions Costs	
CO2 - Base	($6.5)
CO2 - High	($22.9)
CO2 - Low	$0.0
NOX - Base	($0.0)
Total w/ CO2 (Base) & NOX Cost	($21.8)
Total w/ CO2 (High) & NOX Cost	($38.2)
Total w/ CO2 (Low) & NOX Cost	($15.3)

Future Solar Projects Cost-Effectiveness Test (Current ROE)
Laurel Oaks - 66.8 MW

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($7.6)
Capital RR - Solar New Arrays (w/Interconnect)	$63.5
RR of Land for Solar	$4.3
System VOM	($4.0)
FOM - Other Future Units	($0.7)
FOM - Solar Future Arrays	$9.5
System Fuel	($75.1)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($10.2)
Plus Emissions Costs	
CO2 - Base	($5.4)
CO2 - High	($19.3)
CO2 - Low	$0.0
NOX - Base	($0.0)
Total w/ CO2 (Base) & NOX Cost	($15.7)
Total w/ CO2 (High) & NOX Cost	($29.5)
Total w/ CO2 (Low) & NOX Cost	($10.2)

Future Solar Projects Cost-Effectiveness Test (Current ROE)
Riverside - 22.2 MW

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($3.8)
Capital RR - Solar New Arrays (w/Interconnect)	$61.7
RR of Land for Solar	$8.4
System VOM	($4.0)
FOM - Other Future Units	($0.3)
FOM - Solar Future Arrays	$9.2
System Fuel	($75.1)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($3.8)
Plus Emissions Costs	
CO2 - Base	($5.2)
CO2 - High	($18.4)
CO2 - Low	$0.0
NOX - Base	($0.0)
Total w/ CO2 (Base) & NOX Cost	($9.0)
Total w/ CO2 (High) & NOX Cost	($22.2)
Total w/ CO2 (Low) & NOX Cost	($3.8)

Future Solar Projects Cost-Effectiveness Test (Current ROE)
Big Bend III - 22.2 MW

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($9.5)
Capital RR - Solar New Arrays (w/Interconnect)	$22.4
RR of Land for Solar	$0.0
System VOM	($0.8)
FOM - Other Future Units	($0.8)
FOM - Solar Future Arrays	$3.1
System Fuel	($23.3)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($8.9)
Plus Emissions Costs	
CO2 - Base	($1.9)
CO2 - High	($6.5)
CO2 - Low	$0.0
NOX - Base	($0.0)
Total w/ CO2 (Base) & NOX Cost	($10.8)
Total w/ CO2 (High) & NOX Cost	($15.4)
Total w/ CO2 (Low) & NOX Cost	($9.0)

Future Solar Projects Cost-Effectiveness Test (Current ROE)
Palm River Dairy - 70 MW

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($5.7)
Capital RR - Solar New Arrays (w/Interconnect)	$62.1
RR of Land for Solar	$7.5
System VOM	($4.0)
FOM - Other Future Units	($0.5)
FOM - Solar Future Arrays	$9.9
System Fuel	($91.5)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($22.2)
Plus Emissions Costs	
CO2 - Base	($5.8)
CO2 - High	($20.7)
CO2 - Low	$0.0
NOX - Base	($0.0)
Total w/ CO2 (Base) & NOX Cost	($28.0)
Total w/ CO2 (High) & NOX Cost	($42.9)
Total w/ CO2 (Low) & NOX Cost	($22.2)

Future Solar Projects Cost-Effectiveness Test (Current ROE)
Alafia - 50 MW

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	$0.0
Capital RR - Solar New Arrays (w/Interconnect)	$46.4
RR of Land for Solar	$5.7
System VOM	($1.5)
FOM - Other Future Units	$0.0
FOM - Solar Future Arrays	$6.7
System Fuel	($61.5)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($4.3)
Plus Emissions Costs	
CO2 - Base	($4.1)
CO2 - High	($14.5)
CO2 - Low	$0.0
NOX - Base	($0.0)
Total w/ CO2 (Base) & NOX Cost	($8.3)
Total w/ CO2 (High) & NOX Cost	($18.8)
Total w/ CO2 (Low) & NOX Cost	($4.3)

Future Solar Projects Cost-Effectiveness Test (Current ROE)
Wheeler - 74.5 MW

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($7.6)
Capital RR - Solar New Arrays (w/Interconnect)	$59.9
RR of Land for Solar	$8.4
System VOM	($3.8)
FOM - Other Future Units	($0.7)
FOM - Solar Future Arrays	$9.9
System Fuel	($81.8)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($15.6)
Plus Emissions Costs	
CO2 - Base	($5.7)
CO2 - High	($20.2)
CO2 - Low	$0.0
NOX - Base	($0.0)
Total w/ CO2 (Base) & NOX Cost	($21.3)
Total w/ CO2 (High) & NOX Cost	($35.8)
Total w/ CO2 (Low) & NOX Cost	($15.6)

Future Solar Projects Cost-Effectiveness Test (Current ROE)
Dover - 25 MW

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($5.7)
Capital RR - Solar New Arrays (w/Interconnect)	$22.1
RR of Land for Solar	$4.0
System VOM	($0.5)
FOM - Other Future Units	($0.5)
FOM - Solar Future Arrays	$3.3
System Fuel	($24.2)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($1.5)
Plus Emissions Costs	
CO2 - Base	($1.9)
CO2 - High	($6.9)
CO2 - Low	$0.0
NOX - Base	($0.0)
Total w/ CO2 (Base) & NOX Cost	($3.4)
Total w/ CO2 (High) & NOX Cost	($8.4)
Total w/ CO2 (Low) & NOX Cost	($1.5)

Future Solar Projects Revenue Requirements (Current ROE)

600 MW

($000)	
Capital RR	85,275
FOM	6,669
Land RR	6,883
Total RR	98,827

Tranche 1

226.5 MW

($000)	2021
Capital RR	33,436
FOM	2,470
Land RR	2,440
Total RR	38,346

Magnolia
74.5 MW

($000)	2021
Capital RR	10,307
FOM	812
Land RR	586
Total RR	11,705

Big Bend II
25 MW

($000)	2021
Capital RR	3,997
FOM	273
Land RR	-
Total RR	4,269

Mountain View
52.5 MW

($000)	2021
Capital RR	7,951
FOM	572
Land RR	815
Total RR	9,339

Jamison
74.5 MW

($000)	2021
Capital RR	11,181
FOM	812
Land RR	1,039
Total RR	13,032

FULL YEAR

Note: Values may not sum to total due to rounding.

Future Solar Projects Revenue Requirements (Current ROE)

Tranche 2

224 MW

($000)	2022
Capital RR	31,338
FOM	2,496
Land RR	2,262
Total RR	36,096

Laurel Oaks 66.8 MW

($000)	2022
Capital RR	9,487
FOM	744
Land RR	479
Total RR	10,711

Riverside 65 MW

($000)	2022
Capital RR	9,222
FOM	724
Land RR	946
Total RR	10,892

Big Bend III 22.2 MW

($000)	2022
Capital RR	3,345
FOM	247
Land RR	-
Total RR	3,592

Palm River Dairy 70 MW

($000)	2022
Capital RR	9,283
FOM	780
Land RR	838
Total RR	10,901

FULL YEAR

Note: Values may not sum to total due to rounding.

Future Solar Projects Revenue Requirements (Current ROE)

Tranche 3

149.5 MW

($000)	2023
Capital RR	20,502
FOM	1,703
Land RR	2,180
Total RR	24,385

Alafia
50 MW

($000)	2023
Capital RR	7,413
FOM	569
Land RR	682
Total RR	8,664

Wheeler
74.5 MW

($000)	2023
Capital RR	9,560
FOM	849
Land RR	1,014
Total RR	11,422

Dover
25 MW

($000)	2023
Capital RR	3,529
FOM	285
Land RR	484
Total RR	4,298

FULL YEAR

Note: Values may not sum to total due to rounding.

Future Solar Projects Cost-Effectiveness Test (Rate Case ROE)
600 MW of Solar - 226.5/224/149.5 MW

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($58.4)
Capital RR - Solar New Arrays (w/Interconnect)	$574.2
RR of Land for Solar	$62.2
System VOM	($33.0)
FOM - Other Future Units	($8.0)
FOM - Solar Future Arrays	$81.4
System Fuel	($703.5)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($85.0)
Plus Emissions Costs	
CO2 - Base	($45.9)
CO2 - High	($163.9)
CO2 - Low	$0.0
NOX - Base	($0.2)
Total w/ CO2 (Base) & NOX Cost	($131.2)
Total w/ CO2 (High) & NOX Cost	($249.2)
Total w/ CO2 (Low) & NOX Cost	($85.2)

Future Solar Projects Cost-Effectiveness Test (Rate Case ROE)
226.5 MW of Solar - Tranche 1

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($22.0)
Capital RR - Solar New Arrays (w/Interconnect)	$238.5
RR of Land for Solar	$23.6
System VOM	($15.2)
FOM - Other Future Units	($4.8)
FOM - Solar Future Arrays	$32.2
System Fuel	($292.5)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($40.3)
Plus Emissions Costs	
CO2 - Base	($17.9)
CO2 - High	($63.7)
CO2 - Low	$0.0
NOX - Base	($0.1)
Total w/ CO2 (Base) & NOX Cost	($58.2)
Total w/ CO2 (High) & NOX Cost	($104.1)
Total w/ CO2 (Low) & NOX Cost	($40.4)

Future Solar Projects Cost-Effectiveness Test (Rate Case ROE)
224 MW of Solar - Tranche 2

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($24.2)
Capital RR - Solar New Arrays (w/Interconnect)	$208.5
RR of Land for Solar	$20.4
System VOM	($12.3)
FOM - Other Future Units	($2.1)
FOM - Solar Future Arrays	$30.3
System Fuel	($252.0)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($31.5)
Plus Emissions Costs	
CO2 - Base	($17.1)
CO2 - High	($61.1)
CO2 - Low	$0.0
NOX - Base	($0.1)
Total w/ CO2 (Base) & NOX Cost	($48.7)
Total w/ CO2 (High) & NOX Cost	($92.7)
Total w/ CO2 (Low) & NOX Cost	($31.6)

Future Solar Projects Cost-Effectiveness Test (Rate Case ROE)
149.5 MW of Solar - Tranche 3

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($12.1)
Capital RR - Solar New Arrays (w/Interconnect)	$127.2
RR of Land for Solar	$18.2
System VOM	($5.5)
FOM - Other Future Units	($1.1)
FOM - Solar Future Arrays	$18.9
System Fuel	($158.9)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($13.2)
Plus Emissions Costs	
CO2 - Base	($11.0)
CO2 - High	($39.1)
CO2 - Low	$0.0
NOX - Base	($0.0)
Total w/ CO2 (Base) & NOX Cost	($24.2)
Total w/ CO2 (High) & NOX Cost	($52.4)
Total w/ CO2 (Low) & NOX Cost	($13.2)

Future Solar Projects Cost-Effectiveness Test (Rate Case ROE)
Magnolia Solar - 74.5 MW

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($9.3)
Capital RR - Solar New Arrays (w/Interconnect)	$73.5
RR of Land for Solar	$5.7
System VOM	($4.4)
FOM - Other Future Units	($3.5)
FOM - Solar Future Arrays	$10.6
System Fuel	($98.4)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($25.9)
Plus Emissions Costs	
CO2 - Base	($5.9)
CO2 - High	($21.3)
CO2 - Low	$0.0
NOX - Base	($0.0)
Total w/ CO2 (Base) & NOX Cost	($31.8)
Total w/ CO2 (High) & NOX Cost	($47.2)
Total w/ CO2 (Low) & NOX Cost	($25.9)

Future Solar Projects Cost-Effectiveness Test (Rate Case ROE)
Big Bend II Solar - 25 MW

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($1.7)
Capital RR - Solar New Arrays (w/Interconnect)	$28.5
RR of Land for Solar	$0.0
System VOM	($2.3)
FOM - Other Future Units	($0.2)
FOM - Solar Future Arrays	$3.6
System Fuel	($32.4)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($4.5)
Plus Emissions Costs	
CO2 - Base	($2.0)
CO2 - High	($6.9)
CO2 - Low	$0.0
NOX - Base	($0.0)
Total w/ CO2 (Base) & NOX Cost	($6.5)
Total w/ CO2 (High) & NOX Cost	($11.5)
Total w/ CO2 (Low) & NOX Cost	($4.5)

Future Solar Projects Cost-Effectiveness Test (Rate Case ROE)
Mountain View Solar - 52.5 MW

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($7.5)
Capital RR - Solar New Arrays (w/Interconnect)	$56.7
RR of Land for Solar	$7.9
System VOM	($3.2)
FOM - Other Future Units	($0.9)
FOM - Solar Future Arrays	$7.5
System Fuel	($60.2)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	$0.3
Plus Emissions Costs	
CO2 - Base	($3.9)
CO2 - High	($13.9)
CO2 - Low	$0.0
NOX - Base	($0.0)
Total w/ CO2 (Base) & NOX Cost	($3.6)
Total w/ CO2 (High) & NOX Cost	($13.6)
Total w/ CO2 (Low) & NOX Cost	$0.2

Future Solar Projects Cost-Effectiveness Test (Rate Case ROE)
Jamison Solar - 74.5 MW

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($3.5)
Capital RR - Solar New Arrays (w/Interconnect)	$79.8
RR of Land for Solar	$10.1
System VOM	($5.3)
FOM - Other Future Units	($0.3)
FOM - Solar Future Arrays	$10.6
System Fuel	($101.5)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($10.2)
Plus Emissions Costs	
CO2 - Base	($6.1)
CO2 - High	($21.6)
CO2 - Low	$0.0
NOX - Base	($0.0)
Total w/ CO2 (Base) & NOX Cost	($16.3)
Total w/ CO2 (High) & NOX Cost	($31.8)
Total w/ CO2 (Low) & NOX Cost	($10.2)

Future Solar Projects Cost-Effectiveness Test (Rate Case ROE)
Laurel Oaks - 66.8 MW

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($6.9)
Capital RR - Solar New Arrays (w/Interconnect)	$63.1
RR of Land for Solar	$4.3
System VOM	($3.9)
FOM - Other Future Units	($0.6)
FOM - Solar Future Arrays	$9.0
System Fuel	($71.4)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($6.4)
Plus Emissions Costs	
CO2 - Base	($5.1)
CO2 - High	($18.1)
CO2 - Low	$0.0
NOX - Base	($0.0)
Total w/ CO2 (Base) & NOX Cost	($11.5)
Total w/ CO2 (High) & NOX Cost	($24.5)
Total w/ CO2 (Low) & NOX Cost	($6.4)

Future Solar Projects Cost-Effectiveness Test (Rate Case ROE)
Riverside - 22.2 MW

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($3.5)
Capital RR - Solar New Arrays (w/Interconnect)	$61.4
RR of Land for Solar	$8.5
System VOM	($3.8)
FOM - Other Future Units	($0.3)
FOM - Solar Future Arrays	$8.8
System Fuel	($71.3)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($0.2)
Plus Emissions Costs	
CO2 - Base	($4.9)
CO2 - High	($17.3)
CO2 - Low	$0.0
NOX - Base	($0.0)
Total w/ CO2 (Base) & NOX Cost	($5.1)
Total w/ CO2 (High) & NOX Cost	($17.6)
Total w/ CO2 (Low) & NOX Cost	($0.2)

Future Solar Projects Cost-Effectiveness Test (Rate Case ROE)
Big Bend III - 22.2 MW

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($8.7)
Capital RR - Solar New Arrays (w/Interconnect)	$22.3
RR of Land for Solar	$0.0
System VOM	($0.8)
FOM - Other Future Units	($0.8)
FOM - Solar Future Arrays	$3.0
System Fuel	($22.2)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($7.1)
Plus Emissions Costs	
CO2 - Base	($1.7)
CO2 - High	($6.1)
CO2 - Low	$0.0
NOX - Base	($0.0)
Total w/ CO2 (Base) & NOX Cost	($8.9)
Total w/ CO2 (High) & NOX Cost	($13.2)
Total w/ CO2 (Low) & NOX Cost	($7.1)

Future Solar Projects Cost-Effectiveness Test (Rate Case ROE)
Palm River Dairy - 70 MW

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($5.2)
Capital RR - Solar New Arrays (w/Interconnect)	$61.8
RR of Land for Solar	$7.5
System VOM	($3.8)
FOM - Other Future Units	($0.5)
FOM - Solar Future Arrays	$9.5
System Fuel	($87.1)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($17.9)
Plus Emissions Costs	
CO2 - Base	($5.4)
CO2 - High	($19.5)
CO2 - Low	$0.0
NOX - Base	($0.0)
Total w/ CO2 (Base) & NOX Cost	($23.3)
Total w/ CO2 (High) & NOX Cost	($37.4)
Total w/ CO2 (Low) & NOX Cost	($17.9)

Future Solar Projects Cost-Effectiveness Test (Rate Case ROE)
Alafia - 50 MW

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	$0.0
Capital RR - Solar New Arrays (w/Interconnect)	$46.0
RR of Land for Solar	$5.7
System VOM	($1.4)
FOM - Other Future Units	$0.0
FOM - Solar Future Arrays	$6.3
System Fuel	($58.6)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($2.0)
Plus Emissions Costs	
CO2 - Base	($3.8)
CO2 - High	($13.7)
CO2 - Low	$0.0
NOX - Base	($0.0)
Total w/ CO2 (Base) & NOX Cost	($5.8)
Total w/ CO2 (High) & NOX Cost	($15.7)
Total w/ CO2 (Low) & NOX Cost	($2.0)

Future Solar Projects Cost-Effectiveness Test (Rate Case ROE)
Wheeler - 74.5 MW

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($6.9)
Capital RR - Solar New Arrays (w/Interconnect)	$59.3
RR of Land for Solar	$8.5
System VOM	($3.6)
FOM - Other Future Units	($0.6)
FOM - Solar Future Arrays	$9.4
System Fuel	($77.3)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($11.1)
Plus Emissions Costs	
CO2 - Base	($5.3)
CO2 - High	($19.0)
CO2 - Low	$0.0
NOX - Base	($0.0)
Total w/ CO2 (Base) & NOX Cost	($16.5)
Total w/ CO2 (High) & NOX Cost	($30.1)
Total w/ CO2 (Low) & NOX Cost	($11.1)

Future Solar Projects Cost-Effectiveness Test (Rate Case ROE)
Dover - 25 MW

Delta CPVRR Revenue Requirements	Cost/(Savings) (2019 US $ millions)
Capital RR Benefits	($5.2)
Capital RR - Solar New Arrays (w/Interconnect)	$21.9
RR of Land for Solar	$4.0
System VOM	($0.5)
FOM - Other Future Units	($0.5)
FOM - Solar Future Arrays	$3.2
System Fuel	($23.1)
System Capacity	$0.0
Sub Total w/o NOX or CO2 Cost	($0.1)
Plus Emissions Costs	
CO2 - Base	($1.8)
CO2 - High	($6.5)
CO2 - Low	$0.0
NOX - Base	($0.0)
Total w/ CO2 (Base) & NOX Cost	($1.9)
Total w/ CO2 (High) & NOX Cost	($6.6)
Total w/ CO2 (Low) & NOX Cost	($0.1)

Future Solar Projects Revenue Requirements (Rate Case ROE)

600 MW

($000)	
Capital RR	88,461
FOM	6,669
Land RR	7,177
Total RR	102,308

Tranche 1

226.5 MW

($000)	2021
Capital RR	34,685
FOM	2,470
Land RR	2,545
Total RR	39,700

Magnolia
74.5 MW

($000)	2021
Capital RR	10,692
FOM	812
Land RR	611
Total RR	12,115

Big Bend II
25 MW

($000)	2021
Capital RR	4,146
FOM	273
Land RR	-
Total RR	4,419

Mountain View
52.5 MW

($000)	2021
Capital RR	8,249
FOM	572
Land RR	850
Total RR	9,671

Jamison
74.5 MW

($000)	2021
Capital RR	11,599
FOM	812
Land RR	1,083
Total RR	13,494

FULL YEAR

Note: Values may not sum to total due to rounding.

Future Solar Projects Revenue Requirements (Rate Case ROE)

Tranche 2

224 MW of Solar

($000)	2022
Capital RR	32,509
FOM	2,496
Land RR	2,359
Total RR	37,364

Laurel Oaks 66.8 MW

($000)	2022
Capital RR	9,842
FOM	744
Land RR	499
Total RR	11,085

Riverside 65 MW

($000)	2022
Capital RR	9,567
FOM	724
Land RR	986
Total RR	11,277

Big Bend III 22.2 MW

($000)	2022
Capital RR	3,470
FOM	247
Land RR	-
Total RR	3,717

Palm River Dairy 70 MW

($000)	2022
Capital RR	9,630
FOM	780
Land RR	874
Total RR	11,284

FULL YEAR

Note: Values may not sum to total due to rounding.

Future Solar Projects Revenue Requirements (Rate Case ROE)

Tranche 3

149.5 MW

($000)	2023
Capital RR	21,268
FOM	1,703
Land RR	2,274
Total RR	25,244

Alafia
50 MW

($000)	2023
Capital RR	7,689
FOM	569
Land RR	712
Total RR	8,971

Wheeler
74.5 MW

($000)	2023
Capital RR	9,917
FOM	849
Land RR	1,057
Total RR	11,823

Dover
25 MW

($000)	2023
Capital RR	3,661
FOM	285
Land RR	504
Total RR	4,450

FULL YEAR

Note: Values may not sum to total due to rounding.