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April 2, 2024

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 20240026-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 of Jose Aponte and Exhibit No. JA-1.

Thank you for your assistance in connection with this matter.

(Document 6 of 32)

Sincerely,

A handwritten signature in blue ink, appearing to read 'J. Jeffry Wahlen', with a long horizontal flourish extending to the right.

J. Jeffry Wahlen

cc: All parties

JJW/ne
Attachment



**BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION**

**DOCKET NO. 20240026-EI
IN RE: PETITION FOR RATE INCREASE
BY TAMPA ELECTRIC COMPANY**

**PREPARED DIRECT TESTIMONY AND EXHIBIT
OF
JOSE APONTE**

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OF
JOSE APONTE

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1 **BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

2 **PREPARED DIRECT TESTIMONY**

3 **OF**

4 **JOSE APONTE**

5
6 **Q.** Please state your name, address, occupation, and employer.

7
8 **A.** My name is Jose Aponte. My business address is 702 N.
9 Franklin Street, Tampa, Florida 33602. I am employed by
10 Tampa Electric Company ("Tampa Electric" or the "company")
11 as the Manager Resource Planning.

12
13 **Q.** Please describe your duties and responsibilities in that
14 position.

15
16 **A.** My responsibilities include conducting economic
17 evaluations of future resource additions and analyzing the
18 economic and operational impacts to Tampa Electric's
19 system.

20
21 **Q.** Have you previously testified before the Florida Public
22 Service Commission ("Commission")?

23
24 **A.** Yes. I submitted written direct testimony in Docket Nos.
25 20190136-EI and 20200064-EI regarding the company's Third

1 and Fourth SoBRA projects, and Docket No. 20210034-EI
2 regarding the company's petition for a rate adjustment. I
3 also presented to the Commission during the Ten-Year Site
4 Plan Workshop.

5
6 **Q.** Please provide a brief outline of your educational
7 background and business experience.

8
9 **A.** I graduated from the University of South Florida with a
10 Bachelor's degree and a Master's degree in Mechanical
11 Engineering. I am a registered Project Management
12 Professional ("PMP").

13
14 I began working at Tampa Electric in 1999 as an engineer
15 in the Inventory Management and Supply Chain Logistics
16 department. In 2004, I became supervisor for the Materials
17 and Quality Assurance department at the Big Bend Power
18 Station. Since 2008, I have held several positions in the
19 Resource Planning department at Tampa Electric and
20 currently serve as the Manager of Resource Planning.

21
22 I have twenty-four years of electric utility experience
23 working in the areas of planning, systems integration,
24 data analytics, revenue requirements, project economic
25 analysis, and engineering.

1 Q. What are the purposes of your direct testimony?

2

3 A. The purposes of my direct testimony are to (1) discuss the
4 company's plans to add the Polk 1 Flexibility project
5 ("Polk 1 Flexibility") and South Tampa Resilience project
6 ("South Tampa Resilience") to our system; (2) demonstrate
7 that the Polk 1 Flexibility and South Tampa Resilience
8 projects are cost-effective; (3) discuss the company's
9 plans for 12 projects to add energy storage capacity
10 ("Future Energy Storage") and utility-scale solar
11 generating capacity ("Future Solar") to our system; and
12 (4) demonstrate that the Future Energy Storage and Future
13 Solar projects are cost-effective.

14

15 This portfolio of resource additions will operate in
16 concert to provide price stability and reliability benefits
17 for customers, and will enhance operational flexibility,
18 energy diversity, and resiliency in a cost-effective
19 manner. The proposed resource plan yields a total
20 Cumulative Present Value Revenue Requirements ("CPVRR")
21 savings to customers of approximately \$493.5 million
22 compared to a plan without these projects.

23

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

1 **A.** Yes. Exhibit No. JA-1, entitled "Exhibit of Jose Aponte",
2 was prepared under my direction and supervision. The
3 contents of my exhibit were derived from the business
4 records of the company and are true and correct to the best
5 of my information and belief. It consists of 22 documents,
6 as follows:

- 7
- | | | |
|----|-----------------|---------------------------------------|
| 8 | Document No. 1 | Demand and Energy Forecast |
| 9 | Document No. 2 | Fuel Price Forecast |
| 10 | Document No. 3 | Future Project Costs per kWac |
| 11 | Document No. 4 | Polk 1 Flexibility Project Cost- |
| 12 | | Effectiveness Test |
| 13 | Document No. 5 | South Tampa Resilience Project Cost- |
| 14 | | Effectiveness Test |
| 15 | Document No. 6 | Total Energy Storage Capacity Cost- |
| 16 | | Effectiveness Test |
| 17 | Document No. 7 | Dover Energy Storage Capacity Cost- |
| 18 | | Effectiveness Test |
| 19 | Document No. 8 | Lake Mabel Energy Storage Capacity |
| 20 | | Cost-Effectiveness Test |
| 21 | Document No. 9 | Wimauma Energy Storage Capacity Cost- |
| 22 | | Effectiveness Test |
| 23 | Document No. 10 | South Tampa Energy Storage Capacity |
| 24 | | Cost-Effectiveness Test |

25

- 1 Document No. 11 Total Future Solar Cost-Effectiveness
- 2 Test
- 3 Document No. 12 Future Solar (2024 Projects) Cost-
- 4 Effectiveness Test
- 5 Document No. 13 Future Solar (2025 Projects) Cost-
- 6 Effectiveness Test
- 7 Document No. 14 Future Solar (2026 Projects) Cost-
- 8 Effectiveness Test
- 9 Document No. 15 English Creek Solar Cost-Effectiveness
- 10 Test
- 11 Document No. 16 Bullfrog Creek Solar Cost-
- 12 Effectiveness Test
- 13 Document No. 17 Duette Solar Cost-Effectiveness Test
- 14 Document No. 18 Cottonmouth Solar Cost-Effectiveness
- 15 Test
- 16 Document No. 19 Big Four Solar Cost-Effectiveness Test
- 17 Document No. 20 Farmland Solar Cost-Effectiveness Test
- 18 Document No. 21 Brewster Solar Cost-Effectiveness Test
- 19 Document No. 22 Wimauma 3 Solar Cost-Effectiveness
- 20 Test

21

22 **Q.** Are you sponsoring any sections of Tampa Electric's Minimum

23 Filing Requirement ("MFR") Schedules?

24

25 **A.** No.

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

3

4 A. Tampa Electric witness Carlos Aldazabal will explain how
5 the company's proposed Polk 1 Flexibility, South Tampa
6 Resilience, Future Solar, and Future Energy Storage
7 projects fit into the company's plans for its generating
8 portfolio. Tampa Electric witness Kris Stryker will explain
9 the details of the 12 Future Energy Storage and Future
10 Solar projects. He will describe the location, size,
11 timing, and projected costs of each of the 12 projects.

12

13 My direct testimony shows that Tampa Electric's proposed
14 Polk 1 Flexibility, South Tampa Resilience, Future Energy
15 Storage, and Future Solar projects are cost-effective. My
16 testimony also explains that the company's economic
17 analysis shows that a resource plan using the base fuel
18 forecast with the proposed additions is expected to save
19 customers over \$1.18 billion in fuel costs compared to a
20 resource plan without these additions. The per project fuel
21 cost savings are as follows: (1) \$178.0 million of savings
22 from the Polk 1 Flexibility and South Tampa Resilience
23 projects; (2) \$206.1 million of savings from the Future
24 Energy Storage projects; and (3) the remaining \$797.5
25 million of savings from Future Solar projects.

1 My direct testimony will also show that from a CPVRR basis,
2 the company's resource plan with the proposed additions is
3 favorable to customers by approximately \$493.4 million,
4 with \$176.9 million of the total savings anticipated to
5 come from the Polk 1 Flexibility and South Tampa Resilience
6 projects, \$151.2 million in savings from the Future Energy
7 Storage projects, and the remaining \$165.3 million in
8 savings from Future Solar projects.

9
10 The investments and operation and maintenance ("O&M")
11 expenses associated with the Polk 1 Flexibility, the 75.2
12 megawatts ("MW") South Tampa Resilience project, 115 MW of
13 Future Energy Storage, and 246.5 MW of Future Solar
14 projects are reflected in the MFR Schedules for the
15 company's proposed 2025 test year, which are jointly
16 sponsored by Mr. Aldazabal and Mr. Stryker.

17
18 Mr. Stryker presents the company's proposal for
19 recovering the investments and expenses associated with
20 the remaining 242.2 MW of Future Solar in 2026 in his
21 testimony.

22
23 **Q.** Please describe the process Tampa Electric employs for
24 evaluating cost-effectiveness.

25

1 **A.** Tampa Electric evaluates cost-effectiveness based on
2 whether a resource plan with the proposed project would
3 lower the company's projected system CPVRR as compared to
4 such CPVRR without the project. As part of the analysis,
5 we modeled the annual revenue requirement associated with
6 operating the company's generating portfolio with and
7 without the proposed project and used those annual amounts
8 to calculate the CPVRR with and without the proposed
9 project. This technique is widely used by electric
10 utilities during the development of integrated resource
11 plans to evaluate whether to make additions to the
12 generating portfolio.

13

14 **POLK 1 FLEXIBILITY PROJECT**

15 **Q.** Please generally describe the company's plans for Polk Unit
16 1.

17

18 **A.** The Polk 1 Flexibility project consists of converting our
19 existing Polk Unit 1 from a combined cycle unit to a
20 highly efficient simple cycle unit with the latest
21 technology to better utilize that asset. The simple cycle
22 configuration increases the unit's flexibility, allowing
23 fast starts, increased ramp rates, and lower turndowns,
24 which will allow the company to better optimize our lower
25 cost system assets. The simple cycle unit will also have

1 an improved heat rate, which, along with flexibility, are
2 the main drivers for fuel savings.

3
4 **Q.** Do you have the Polk 1 Flexibility project's projected cost
5 in dollars per kW_{ac}?

6
7 **A.** Yes. The projected costs, excluding Allowance for Funds
8 Used for Construction ("AFUDC"), were provided to me by
9 Mr. Aldazabal, who explains the cost and project schedule
10 in his direct testimony. I added the AFUDC amounts to the
11 project costs to arrive at the total project cost in
12 dollars per kW_{ac} shown in Document No. 3 of my exhibit.

13
14 **Q.** How were the AFUDC amounts included in your project costs
15 per kW_{ac} determined?

16
17 **A.** Capital spending was provided to the company's accounting
18 team, who then calculated the AFUDC for the project. The
19 AFUDC costs were provided to me and included in the cost-
20 effectiveness calculations.

21
22 **COST-EFFECTIVENESS OF THE POLK 1 FLEXIBILITY PROJECT**

23 **Q.** Is the Polk 1 Flexibility project cost-effective?

24
25 **A.** Yes. The Polk 1 Flexibility project is cost-effective.

1 **Q.** Please describe the analysis Tampa Electric performed to
2 evaluate the cost-effectiveness of the Polk 1 Flexibility
3 project.

4
5 **A.** The company performed the analysis using our Integrated
6 Resource Planning models to prepare a base case scenario
7 with Polk Unit 1 operating as a combined cycle unit. We
8 then prepared a change case scenario with Polk Unit 1
9 converted to simple cycle and compared the change case to
10 the base case. The base and change cases used production
11 cost modeling software to determine system CPVRR, including
12 fuel costs and variable O&M, and then the costs associated
13 with a change case were subtracted from the base case to
14 determine the savings.

15
16 **Q.** Please explain the assumptions underlying the company's
17 cost-effectiveness calculations.

18
19 **A.** The primary assumptions for the cost-effectiveness
20 calculations are the company's Demand and Energy Forecast,
21 the fuel price forecast, and the projected revenue
22 requirements of the Polk 1 Flexibility project. We prepared
23 our cost-effectiveness analyses with the Demand and Energy
24 Forecast used to prepare Tampa Electric's 2024 cost
25 recovery factors and its 2024 Ten Year Site Plan. A summary

1 of the values in the Demand and Energy Forecast is shown
2 in Document No. 1 of my exhibit.

3
4 The company prepared the fuel forecast using the same
5 methodology the company has used to develop its fuel price
6 forecast each year over the last decade, and it is shown
7 in Document No. 2 of my exhibit.

8

9 **Q.** How did the company calculate the annual revenue
10 requirements used in the analysis?

11

12 **A.** The company used project-specific projected costs to
13 calculate the revenue requirement. Consistent with the
14 guidelines in the 2021 Stipulation and Settlement Agreement
15 ("2021 Agreement"), approved by the Commission on November
16 10, 2021 in Order No. PSC-2021-0423-S-EI in Docket
17 20210034-EI, we updated the long-term debt rate to 5.5
18 percent to reflect the prospective long-term debt issuances
19 during the first 12 months of operations of the project.
20 The revenue requirement calculation included reasonable
21 estimates for O&M expenses, depreciation expense, and
22 taxes.

23

24 **Q.** Did the company consider AFUDC when calculating the revenue
25 requirements described above?

1 **A.** Yes. We calculated the revenue requirements with and
2 without AFUDC.

3

4 **Q.** How much fuel expense will the Polk 1 Flexibility project
5 allow the company's customers to avoid over the life of
6 the project?

7

8 **A.** Based on our base fuel forecast, we expect that the Polk 1
9 Flexibility project will save our customers approximately
10 \$40 million in fuel costs.

11

12 **Q.** Please describe the results of the company's cost-
13 effectiveness analysis for the Polk 1 Flexibility project.

14

15 **A.** Tampa Electric's analysis showed that the Polk 1
16 Flexibility project is cost effective. The CPVRR
17 differential was favorable for customers by \$166.9 million
18 before including any value for reduced emissions. Including
19 reduced emissions benefits increased the CPVRR savings from
20 the Polk 1 Flexibility project to \$170.3 million. Document
21 No. 4 of my exhibit shows the results of our analysis.

22

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

25

1 **A.** Yes. Tampa Electric tested the CPVRR savings calculated in
2 its analysis using high and low fuel price forecasts. The
3 high and low fuel forecasts were prepared contemporaneously
4 with the base fuel forecast. The results show that customer
5 savings occur under all fuel price forecast sensitivities.
6

7 **SOUTH TAMPA RESILIENCE PROJECT**

8 **Q.** Please generally describe the company's plans for the South
9 Tampa Resilience project.
10

11 **A.** The South Tampa Resilience project is a Distributed Energy
12 Resource ("DER") facility located on MacDill Air Force Base
13 ("MAFB"). It consists of four Reciprocating Internal
14 Combustion Engines ("RICE") units with a total capacity of
15 75.2 MW. Phase 1 (37.6 MW) has an expected commercial in-
16 service date of April 2025, and Phase 2 (37.6 MW) has an
17 expected commercial in-service date of June 2026.
18

19 These highly reliable, cost-effective resources are quick
20 start units that enhance the system's operational
21 flexibility compared to larger frame CT, and more
22 frequently result in fuel savings and greenhouse gas
23 emission reductions. The MAFB provided access to the site
24 in exchange for the added level of resilience to the
25 company's customers in the middle of a dense load center

1 and the base.

2

3 **Q.** Do you have the South Tampa Resilience projected cost in
4 dollars per kW_{ac}?

5

6 **A.** Yes. The projected costs, excluding AFUDC, were provided
7 to me by Mr. Aldazabal, who explains the cost and project
8 schedule in his direct testimony. I added the AFUDC amounts
9 to the project costs to arrive at the total project cost
10 in dollars per kW_{ac} shown in Document No. 3 of my exhibit.

11

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

14

15 **A.** Capital spending was provided to the company's accounting
16 team, who then calculated the AFUDC for the project. The
17 AFUDC costs were provided to me and included in the cost-
18 effectiveness calculations.

19

20 **COST-EFFECTIVENESS OF THE SOUTH TAMPA RESILIENCE PROJECT**

21 **Q.** Is the South Tampa Resilience project cost-effective?

22

23 **A.** Yes. The South Tampa Resilience project is cost-effective.

24

25 **Q.** Please describe the analysis Tampa Electric performed to

1 evaluate the cost-effectiveness of the South Tampa
2 Resilience project.

3
4 **A.** Tampa Electric performed the analysis using our Integrated
5 Resource Planning models to prepare a base case scenario
6 without the four reciprocating engines. We then prepared a
7 change case scenario with South Tampa Resilience
8 reciprocating engines and compared the change case to the
9 base case. The base and change cases used production cost
10 modeling software to determine system CPVRR, including fuel
11 and variable O&M costs, and then the costs associated with
12 the change case were subtracted from the base case to
13 determine the savings.

14
15 **Q.** Please explain the assumptions underlying the company's
16 cost-effectiveness calculations.

17
18 **A.** The primary assumptions for the cost-effectiveness
19 calculations are the company's Demand and Energy Forecast,
20 the fuel price forecast, and the projected revenue
21 requirements of the South Tampa Resilience project.

22
23 We prepared our cost-effectiveness analysis with the Demand
24 and Energy Forecast used to prepare Tampa Electric's 2024
25 cost recovery factors and its 2024 Ten Year Site Plan. A

1 summary of the values in the Demand and Energy Forecast is
2 shown in Document No. 1 of my exhibit.

3
4 The company prepared the fuel forecast using the same
5 methodology the company has used to develop its fuel price
6 forecast each year over the last decade, and it is shown
7 in Document No. 2 of my exhibit.

8
9 **Q.** How did the company calculate the annual revenue
10 requirements used in the analysis?

11
12 **A.** The company used project-specific projected costs to
13 calculate the revenue requirement. Consistent with the
14 guidelines in the 2021 Agreement, we updated the long-term
15 debt rate to 5.5 percent to reflect the prospective long-
16 term debt issuances during the first 12 months of
17 operations of the project. The revenue requirement
18 calculation included reasonable estimates for O&M
19 expenses, depreciation expense, and taxes.

20
21 **Q.** Did the company consider AFUDC when calculating the revenue
22 requirements described above?

23
24 **A.** Yes. We calculated the revenue requirements with and
25 without AFUDC.

1 **Q.** How much fuel expense will the South Tampa Resilience
2 project allow the company's customers to avoid over the
3 life of the project?
4

5 **A.** Based on our base fuel forecast, we expect the South Tampa
6 Resilience project to save our customers approximately
7 \$137.9 million in fuel costs.
8

9 **Q.** Please describe the results of the company's cost-
10 effectiveness analysis.
11

12 **A.** Our analysis showed that the South Tampa Resilience project
13 is cost-effective. The CPVRR differential was favorable
14 for customers by \$10.0 million before including any value
15 for reduced emissions. Including reduced emissions
16 benefits increased the CPVRR savings from South Tampa
17 Resilience project to \$32.4 million. Document No. 5 of my
18 exhibit shows the results of our analysis.
19

20 **Q.** Did the company conduct sensitivity testing on the results
21 of its cost-effectiveness analysis?
22

23 **A.** Yes. Tampa Electric tested the CPVRR savings calculated in
24 its analysis using high and low fuel price forecasts. The
25 high and low fuel forecasts were prepared contemporaneously

1 with the base fuel forecast. The results show that customer
2 savings occur under the base and high fuel price forecast
3 sensitivities.
4

5 **TAMPA ELECTRIC'S PLAN FOR FUTURE ENERGY STORAGE PROJECTS**

6 **Q.** Please generally describe the company's plans to build
7 Future Energy Storage Capacity.
8

9 **A.** Tampa Electric plans to add a total of 115 MW of utility-
10 scale energy storage capacity projects located across four
11 sites inside its service territory by April 2025: (1)
12 Dover; (2) Lake Mabel; (3) Wimauma; and (4) South Tampa.
13 These projects will help the company maintain the required
14 winter capacity reserve margin as peak load grows with
15 increased customers. Additionally, the projects will
16 provide fuel savings for customers through energy
17 arbitrage, where energy is stored during off-peak hours
18 when electricity prices are cheapest and used during on-
19 peak hours when electricity prices are highest.
20

21 The Lake Mabel Future Energy Storage Capacity project has
22 the added benefit of eliminating an otherwise necessary
23 transmission upgrade by locating an energy source close to
24 a high load area.
25

1 Q. Do you have a list of the Future Energy Storage projects
2 and their projected costs in dollars per kW_{ac}?

3

4 A. Yes. The projected costs, excluding AFUDC, were provided
5 to me by Mr. Stryker, who explains the costs and project
6 schedules in his direct testimony. I added the AFUDC
7 amounts to the project costs to arrive at the total project
8 costs in dollars per kW_{ac} shown in Document No. 3 of my
9 exhibit.

10

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

13

14 A. Capital spending was provided to the company's accounting
15 team, who then calculated the AFUDC per project. These
16 AFUDC costs were provided to me and included in the cost-
17 effectiveness calculations.

18

19 **COST-EFFECTIVENESS OF THE FUTURE ENERGY STORAGE PROJECTS**

20 Q. Are the planned Future Energy Storage projects cost-
21 effective?

22

23 A. Yes. The planned Future Energy Storage projects are cost-
24 effective in total, and on an individual project basis.

25

1 **Q.** Please describe the analyses Tampa Electric performed to
2 evaluate the cost-effectiveness of the Future Energy
3 Storage projects.

4
5 **A.** The company performed the analyses using our Integrated
6 Resource Planning models to prepare a base case scenario
7 without the planned energy storage capacity projects. We
8 then prepared change case scenarios for the 115 MW in
9 total, and for each individual project, and compared the
10 change cases to the base case. The base case and change
11 cases used production cost modeling software to determine
12 system CPVRR, including fuel and variable O&M costs, and
13 then the costs associated with the change cases were
14 subtracted from the base case to determine the savings.

15
16 **Q.** Please explain the assumptions underlying the company's
17 cost-effectiveness calculations.

18
19 **A.** The primary assumptions for the cost-effectiveness
20 calculations are the company's Demand and Energy Forecast,
21 the fuel price forecast, and the projected revenue
22 requirements of the planned energy storage capacity
23 projects.

24
25 We prepared our cost-effectiveness analyses with the Demand

1 and Energy Forecast used to prepare Tampa Electric's 2024
2 cost recovery factors and its 2024 Ten Year Site Plan. A
3 summary of the values in the Demand and Energy Forecast is
4 shown in Document No. 1 of my exhibit.

5
6 The company prepared the fuel forecast using the same
7 methodology the company has used to develop its fuel price
8 forecast each year over the last decade, and it is shown
9 in Document No. 2 of my exhibit.

10
11 **Q.** How did the company calculate the annual revenue
12 requirements used in the analysis?

13
14 **A.** The company used project-specific projected costs to
15 calculate a revenue requirement by project, and in total.
16 Consistent with the guidelines in the 2021 Agreement, we
17 updated the long-term debt rate to 5.5 percent to reflect
18 the prospective long-term debt issuances during the first
19 12 months of operations of the projects. The investment
20 tax credits associated with the energy storage capacity
21 projects were normalized over the life of the assets in
22 accordance with applicable Internal Revenue Service
23 regulations. Our revenue requirement calculation included
24 reasonable estimates for O&M expenses, depreciation
25 expense, and taxes.

1 Q. Did the company consider AFUDC when calculating the revenue
2 requirements described above?

3

4 A. Yes. We calculated the revenue requirements with and
5 without AFUDC costs.

6

7 Q. How much fuel expense will the energy storage capacity
8 projects allow the company's customers to avoid over the
9 life of the project?

10

11 A. Based on our base fuel forecast, Tampa Electric expects
12 Future Energy Storage projects to save our customers
13 approximately \$206.1 million in fuel costs over the life
14 of the projects.

15

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

18

19 A. The company's analysis showed that the planned energy
20 storage capacity is cost-effective in total and by project.
21 Document Nos. 6 through 10 of my exhibit shows the results
22 of the analyses by individual project.

23

24 For the planned Future Energy Storage in total, the CPVRR
25 differential was favorable for customers by \$151.2 million

1 before including any value for reduced emissions. Including
2 reduced emissions benefits increased the CPVRR savings from
3 Future Battery Storage to \$169.9 million.

4
5 The CPVRR savings for Future Energy Storage by project were
6 \$18.7 million (Dover Energy Storage Capacity), \$63.0
7 million (Lake Mabel Energy Storage Capacity), \$52.5 million
8 (Wimauma Energy Storage Capacity), and \$17.1 million (South
9 Tampa Energy Storage Capacity) before including any value
10 for reduced emissions. Including reduced emissions
11 benefits increased the CPVRR savings from Future Battery
12 Storage to \$22.3 million (Dover Energy Storage Capacity),
13 \$69.9 million (Lake Mabel Energy Storage Capacity), \$58.2
14 million (Wimauma Energy Storage Capacity), and \$19.6
15 million (South Tampa Energy Storage Capacity).

16
17 **Q.** Did the company conduct sensitivity testing on the results
18 of its cost-effectiveness analysis?

19
20 **A.** Yes. Tampa Electric tested the CPVRR savings calculated in
21 its analysis using high and low fuel price forecasts. The
22 high and low fuel forecasts were prepared contemporaneously
23 with the base fuel forecast. The results show that customer
24 savings occur under all fuel price forecast sensitivities.

25

1 **TAMPA ELECTRIC'S PLAN FOR FUTURE SOLAR**

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

4
5 **A.** Since 2015, Tampa Electric has deployed utility scale solar
6 generation. As of January 2024, Tampa Electric owns and
7 operates 22 solar generating sites geographically dispersed
8 throughout its service territory with a combined capacity
9 of 1,252 MW. The company's cost-effective solar portfolio
10 includes 1,247 MW of primary single axis tracking
11 photovoltaic ("PV") solar arrays throughout Hillsborough
12 and Polk Counties. It also includes a 1.6 MW fixed tilt
13 solar photovoltaic ("PV") rooftop canopy array located at
14 the top of the south parking garage at Tampa International
15 Airport, a 1.4 MW fixed tilt solar PV ground canopy array
16 located at Legoland Florida, a 1.0 MW floating solar
17 project, and a 1.0 MW agrivoltaics pilot project at Big
18 Bend Power Station.

19
20 Tampa Electric installed 600 MW of this capacity pursuant
21 to the company's 2017 Amended and Restated Stipulation and
22 Settlement Agreement ("2017 Agreement") approved by the
23 Commission on November 27, 2017, in Order No. PSC-2017-
24 0456-EI. Another 595 MW of this capacity was installed
25 pursuant to the company's 2021 Agreement.

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In 2023, our solar facilities produced about eight percent of the total energy for load.

As noted in the direct testimony of Mr. Stryker, the company's solar expansion is a cost-effective way to serve increased customer load while reducing the impact of fuel price fluctuations on customer bills due to the zero-fuel cost generation. The proposed Future Solar will help moderate fuel price volatility, increase fuel diversity, reduce reliance on natural gas, and have little to no water requirements for operations. In addition, with the passage of the Inflation Reduction Act, the federal government is providing additional tax incentives which will benefit our customers.

When Tampa Electric completes our Future Solar projects, nearly 18 percent of our energy will be from solar. This cost-effective long-term energy solution will promote fuel price stability for customers and increase our fuel diversity.

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

A. Tampa Electric plans to add an additional 488.7 MW of

1 utility-scale solar PV projects across its service
2 territory by the end of 2026.

3
4 The company plans to add the projects to its generating
5 fleet over a three-year period. By the end of 2024, we will
6 place in-service another 97.5 MW. During 2025, Tampa
7 Electric will place 149 MW of Future Solar projects in-
8 service, and the company will add 242.2 MW in-service by
9 the end of 2026.

10
11 The Future Solar projects will be general system resources,
12 not dedicated to a subset of solar energy subscribers and,
13 therefore, their benefits will inure to all of our
14 customers.

15
16 **Q.** Do you have a list of the Future Solar projects by year
17 and their projected cost in dollars per kW_{ac}?

18
19 **A.** Yes. The projected cost for each Future Solar project,
20 excluding AFUDC, was provided by Mr. Stryker who explains
21 the costs and project schedules in his direct testimony. I
22 added the AFUDC amounts to the project costs to arrive at
23 the total project costs in dollars per kW_{ac} shown in
24 Document No. 3 of my exhibit.

25

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

3

4 A. Capital spending was provided to the company's accounting
5 team, who then calculated the AFUDC per project. These
6 AFUDC costs were provided to me and included in the cost-
7 effectiveness calculations.

8

9 **COST-EFFECTIVENESS OF FUTURE SOLAR**

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

11

12 A. Yes. Excluding savings from avoided carbon emission costs,
13 the Future Solar projects are cost-effective in total, by
14 year, and individually except for one project.

15

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

19

20 A. We performed the analyses using our Integrated Resource
21 Planning models to prepare a base case scenario without
22 the Future Solar. We then prepared change case scenarios
23 for the 488.7 MW in total, for each year in total, and for
24 each individual project, and compared the change cases to
25 the base case. The base and change cases used production

1 cost modeling software to determine system CPVRR, including
2 fuel and variable O&M costs, and then the costs associated
3 with the change case were subtracted from the base case to
4 determine the savings.

5

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

8

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

13

14 We prepared our cost-effectiveness analyses with the Demand
15 and Energy Forecast used to prepare Tampa Electric's 2024
16 cost recovery factors and its 2024 Ten Year Site Plan. A
17 summary of the values in the Demand and Energy Forecast is
18 shown in Document No. 1 of my exhibit.

19

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

24

25 **Q.** How did the company calculate the annual revenue

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requirements used in the analysis?

A. The company used project-specific projected costs to calculate the revenue requirement by project and in total.

Consistent with the guidelines in the 2021 Agreement, we updated the long-term debt rate to 5.5 percent to reflect the prospective long-term debt issuances during the first 12 months of operations of the projects. The production tax credits associated with the utility-scale solar projects were applied over the first 10-year life of the assets in accordance with applicable Internal Revenue Service regulations. The revenue requirement calculation included reasonable estimates for O&M expenses, depreciation expense, and taxes, including the projected impact of the property tax exemption for solar projects.

Q. Did the company consider AFUDC and avoided carbon emission costs when calculating the revenue requirements described above?

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

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

3

4 A. The 488.7 MW of Future Solar will decrease carbon dioxide
5 ("CO₂") emissions by over 450 thousand tons per year and
6 decrease nitrogen oxide ("NO_x") and sulfur dioxide ("SO₂")
7 emissions by hundreds of tons.

8

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

11

12 A. Tampa Electric worked with a third-party contractor to
13 estimate the avoided cost of carbon emissions for the
14 Future Solar projects. Since 2015, upon the issuance of
15 the draft Clean Power Plan, the company has monitored
16 forecasted carbon prices. The company used a CO₂ forecast
17 based on current assumptions and market conditions from
18 global consulting services company ICF International, Inc.
19 ("ICF"). ICF provides projections for various regions of
20 the country as well as low, medium, and high cost-of-carbon
21 forecasts.

22

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

25

1 **A.** Yes. Although our federal government and the State of
2 Florida do not currently impose a tax or fee on carbon
3 emissions, public policy considerations and customer
4 expectations in the United States and around the world are
5 trending against carbon emissions and in favor of renewable
6 energy like solar generation. It is difficult to predict
7 when a carbon tax or fee will be imposed on the company,
8 but it is even more difficult to completely rule out that
9 possibility. Accordingly, it is reasonable to consider the
10 value of avoided carbon costs when evaluating the cost-
11 effectiveness of generating alternatives, including our
12 Future Solar projects.

13
14 **Q.** How much fuel expense will Future Solar allow the company's
15 customers to avoid over the life of the projects?

16
17 **A.** Based on our base fuel forecast, we expect Future Solar to
18 save our customers approximately \$797.5 million in fuel
19 costs over the life of the projects.

20
21 **Q.** Please describe the results of the company's cost-
22 effectiveness analysis.

23
24 **A.** Document Nos. 11 through 22 of my exhibit shows the results
25 of the analyses.

1 For Future Solar in total, the CPVRR differential in our
2 analysis was favorable for customers by \$165.3 million
3 before including any value for reduced emissions. Including
4 reduced emissions benefits increased the CPVRR savings from
5 Future Solar to \$322.3 million.

6
7 The CPVRR savings for Future Solar by year in our analysis
8 were \$34.0 million for the 2024 projects, \$52.6 million
9 for the 2025 projects, and \$78.7 million for the 2026
10 projects before including any value for reduced emissions.
11 Including reduced emissions benefits increased the CPVRR
12 savings from Future Solar to \$66.0 million for the 2024
13 projects, \$100.5 million for the 2025 projects, and \$155.8
14 million for the 2026 projects.

15
16 **Q.** Did the company conduct sensitivity testing on the results
17 of its cost-effectiveness analysis?

18
19 **A.** Yes. Tampa Electric tested the CPVRR savings calculated in
20 its analysis using high and low fuel price forecasts. The
21 high and low fuel forecasts were prepared contemporaneously
22 with the base fuel forecast. Results of the high fuel price
23 sensitivity show that all individual projects are cost-
24 effective, and under the low fuel price sensitivity all
25 but two projects show benefits to customers.

1 **OTHER BENEFITS TO THE RESILIENCE AND CAPACITY PROJECTS**

2 **Q.** Are there any other benefits besides cost savings that the
3 Polk 1 Flexibility and South Tampa Resilience projects will
4 provide to Tampa Electric's customers and the communities
5 where they live?

6
7 **A.** Yes. As explained in the testimony of Mr. Aldazabal, the
8 Polk 1 Flexibility and South Tampa Resilience projects will
9 improve the company's utilization of its generating assets
10 due to the increased flexibility, reduced maintenance
11 intervals, fast start capability, improved heat rates,
12 faster ramp rates, and lower turndowns provided by these
13 projects.

14
15 These projects also strengthen Tampa Electric's near-term
16 reserve margins and further insulate our customers from
17 disruptions during an extreme weather event.

18
19 **Q.** Are there any other benefits besides cost savings that the
20 Future Energy Storage and Future Solar projects will
21 provide to Tampa Electric's customers and the communities
22 where they live?

23
24 **A.** Yes. As noted in the testimony of Mr. Stryker, our Future
25 Solar and Future Energy Storage projects will require fewer

1 financial resources to operate than fossil fuel-burning
2 plants and will substitute, in part, for operation of solid
3 fuel generating assets that cost more to operate and
4 maintain, which will allow the company to incur less O&M
5 expense.

6
7 Additionally, because solar resources do not burn fuel or
8 have moving parts that operate under high temperatures and
9 pressures, solar generators are safer to operate than
10 fossil fuel-burning generators. Solar generation is not
11 only emission-free, but also requires little to no water
12 for operation, which is better for protecting Florida water
13 resources.

14
15 Further, with the passage of the Inflation Reduction Act,
16 the federal government is providing additional tax
17 incentives which will also benefit our customers.

18
19 Construction of these projects will create new jobs in this
20 area, which will help our local economy. The solar projects
21 also generate new property tax revenues for the local
22 governments where they are located.

23
24 **PRUDENCE OF THE COMPANY'S PROPOSED RESOURCE PLAN**

25 **Q.** Is the company's proposed resource plan prudent?

1 **A.** Yes. As noted in the testimony of Mr. Aldazabal and Mr.
2 Stryker, the company has planned and will be constructing
3 the 14 projects in the proposed resource plan at the lowest
4 reasonable cost. My direct testimony shows these projects
5 are cost-effective in total and by year.

6
7 The Polk 1 Flexibility, South Tampa Resilience, and Future
8 Energy Storage projects will improve the company's
9 utilization of the system generating assets due to the
10 increased dispatch flexibility provided by these projects.
11 The 14 projects included in our proposed resource plan will
12 result in lower fuel costs for customers.

13
14 The Future Energy Storage projects also will enable energy
15 arbitrage that will provide fuel cost savings for customers
16 by storing lower cost off-peak energy and delivering it
17 during peak times. Additionally, these assets will provide
18 increased resilience and improve system reliability by
19 helping the company maintain the required winter capacity
20 reserve margin as peak load grows.

21
22 The proposed Future Solar projects reduce electricity
23 costs, reduce price volatility for customers, improve fuel
24 diversity, reduce reliance on natural gas, have little to
25 no water requirements for operations, and provide

1 alternative sources of energy that enhance system
2 reliability and resilience.

3
4 The company's Future Solar projects will require fewer
5 financial resources to operate than fossil fuel-burning
6 plants, and will substitute, in part, for operation of
7 fossil fuel generating assets that cost more to operate
8 and maintain, which will allow the company to incur less
9 O&M expense.

10
11 **SUMMARY**

12 **Q.** Please summarize your direct testimony.

13
14 **A.** My direct testimony describes the company's plans to
15 upgrade Polk Unit 1 to a highly efficient simple cycle unit
16 (Polk 1 Flexibility project), add 75.2 MW of distributed
17 energy resources for improved system resilience (South
18 Tampa Resilience project), add 115 MW of Energy Storage
19 Capacity, and add an additional 488.7 MW of utility-scale
20 Future Solar generating capacity to our system. My direct
21 testimony also demonstrates that the Polk 1 Flexibility,
22 South Tampa Resilience, Future Solar, and Future Energy
23 Storage capacity projects are cost-effective, will benefit
24 customers, and are prudent.

25

1 The company's proposed resource plan is expected to save
2 customers just over \$1.18 billion in fuel costs alone over
3 the life of these assets compared to a resource plan
4 without these additions, with \$178.0 million of the total
5 savings anticipated to come from the Polk 1 Flexibility
6 and South Tampa Resilience projects, \$206.1 million in
7 savings from the Future Energy Storage projects, and the
8 remaining \$797.5 million from the Future Solar projects.

9
10 On a CPVRR basis and excluding any benefits from reduced
11 emissions, the proposed resource plan is estimated to be
12 favorable to customers by \$493.4 million over the life of
13 these assets compared to a resource plan without the
14 proposed additions, with \$176.9 million of the total CPVRR
15 savings anticipated to come from the Polk 1 Flexibility
16 and South Tampa Resilience projects, \$151.2 million savings
17 from the Future Energy Storage projects, and the remaining
18 \$165.3 million of savings from the Future Solar projects.

19
20 The collection of projects in the proposed resource plan
21 lowers overall costs to customers while simultaneously
22 increasing system reliability and flexibility, reducing
23 price and supply risk from natural gas, and lowering
24 greenhouse gas emissions.

25

1 Q. Does this conclude your direct testimony?

2

3 A. Yes, it does.

4

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EXHIBIT

OF

JOSE APONTE

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Demand and Energy Forecast

Year	Winter (MW)	Summer (MW)	Energy (GWh)
2024	4,513	4,384	21,355
2025	4,566	4,421	21,513
2026	4,625	4,461	21,706
2027	4,683	4,501	21,900
2028	4,739	4,542	22,100
2029	4,795	4,584	22,313
2030	4,850	4,626	22,532
2031	4,903	4,668	22,757
2032	4,954	4,710	22,990
2033	5,005	4,752	23,224
2034	5,055	4,795	23,472
2035	5,104	4,843	23,754
2036	5,151	4,889	24,036
2037	5,199	4,936	24,319
2038	5,246	4,982	24,613
2039	5,293	5,026	24,897
2040	5,337	5,068	25,175
2041	5,380	5,111	25,450
2042	5,424	5,154	25,742
2043	5,468	5,197	26,028
2044	5,514	5,240	26,320
2045	5,560	5,283	26,596
2046	5,605	5,325	26,896
2047	5,651	5,368	27,189
2048	5,696	5,410	27,482
2049	5,743	5,452	27,760
2050	5,790	5,501	28,071
2051	5,837	5,557	28,385
2052	5,884	5,620	28,703
2053	5,931	5,690	29,024

Fuel Price Forecast (\$/MMBtu)

Year	Natural Gas	Coal
2024	3.85	4.05
2025	4.31	4.03
2026	4.55	4.24
2027	5.23	4.58
2028	5.82	4.86
2029	5.61	5.03
2030	5.40	5.33
2031	5.40	5.68
2032	5.45	5.66
2033	5.66	5.83
2034	5.89	6.00
2035	6.19	6.17
2036	6.38	6.42
2037	6.64	6.70
2038	6.70	7.08
2039	7.01	7.35
2040	7.29	7.69
2041	7.52	7.93
2042	7.51	8.19
2043	7.63	8.57
2044	7.55	8.95
2045	7.73	9.35
2046	7.67	9.75
2047	7.79	10.12
2048	7.94	10.47
2049	8.00	10.88
2050	8.17	11.31
2051	8.30	11.74
2052	8.43	12.20
2053	8.55	12.50

Future Project Costs per kW_{ac} Including AFUDC

Project Name	Cost \$/kW	Capacity (MW)
Polk 1 Flexibility Project	397	203.0
South Tampa Resilience	2,224	75.2
Dover Energy Storage Capacity	1,285	15.0
Lake Mabel Energy Storage Capacity	1,281	40.0
Wimauma Energy Storage Capacity	1,108	40.0
South Tampa Energy Storage Capacity	1,410	20.0
Bullfrog Creek Solar ¹	1,471	74.5
English Creek Solar	1,878	23.0
Cottonmouth Solar ¹	1,492	74.5
Duette Solar	1,536	74.5
Big Four Solar ¹	1,399	74.5
Farmland Solar	1,755	54.4
Brewster Solar	1,475	38.8
Wimauma 3 Solar ¹	1,695	74.5

¹ Land Lease costs (if applicable) are not included these figures but included in the cost effectiveness analyses

Polk 1 Flexibility Project

Cost-Effectiveness Test

Base Fuel Forecast	Cost/(Savings) (2024 US \$ millions)
Capital RR - Polk 1 Project Upgrade	(\$40.8)
Capital RR - Polk 1 Sustaining Capital	(\$50.1)
Capital RR - Balance of System*	\$8.7
System FOM	(\$20.3)
System VOM	(\$24.0)
System Fuel	(\$40.0)
Start Costs	(\$0.3)
Sub Total w/o CO ₂ Emissions	(\$166.9)
CO ₂ Emissions Cost / (Savings)	(\$3.4)
Total w/ CO ₂ Emissions	(\$170.3)

* Capital RR - Balance of System includes new and/or avoided generation, transmission, and interconnect capital.

South Tampa Resilience Project

Cost-Effectiveness Test

Base Fuel Forecast	Cost/(Savings) (2024 US \$ millions)
Capital RR - Reciprocating Engines	\$203.3
Capital RR - Balance of System*	(\$73.9)
System FOM	\$10.3
System VOM	(\$9.4)
System Fuel	(\$137.9)
Start Costs	(\$2.4)
Sub Total w/o CO ₂ Emissions	(\$10.0)
CO ₂ Emissions Cost /(Savings)	(\$22.4)
Total w/ CO ₂ Emissions	(\$32.4)

* Capital RR - Balance of System includes new and/or avoided generation, transmission, and interconnect capital.

Future Energy Storage Capacity (115 MW)

Cost-Effectiveness Test

Base Fuel Forecast	Cost/(Savings) (2024 US \$ millions)
Capital RR - New Batteries	\$124.8
Capital RR - Balance of System*	(\$54.2)
System FOM	(\$2.1)
System VOM	(\$6.9)
System Fuel	(\$206.1)
Start Costs	(\$6.7)
Sub Total w/o CO ₂ Emissions	(\$151.2)
CO ₂ Emissions Cost / (Savings)	(\$18.7)
Total w/ CO ₂ Emissions	(\$169.9)

* Capital RR - Balance of System includes new and/or avoided generation, transmission, and interconnect capital.

Dover Energy Storage Capacity

Cost-Effectiveness Test

Base Fuel Forecast	Cost/(Savings) (2024 US \$ millions)
Capital RR - New Batteries	\$16.8
Capital RR - Balance of System*	\$0.0
System FOM	\$0.7
System VOM	(\$3.6)
System Fuel	(\$31.6)
Start Costs	(\$1.0)
Sub Total w/o CO ₂ Emissions	(\$18.7)
CO ₂ Emissions Cost /(Savings)	(\$3.6)
Total w/ CO ₂ Emissions	(\$22.3)

* Capital RR - Balance of System includes new and/or avoided generation, transmission, and interconnect capital.

Lake Mabel Energy Storage Capacity
Cost-Effectiveness Test

Base Fuel Forecast	Cost/(Savings) (2024 US \$ millions)
Capital RR - New Batteries	\$45.0
Capital RR - Balance of System*	(\$25.3)
System FOM	\$1.0
System VOM	(\$1.5)
System Fuel	(\$80.3)
Start Costs	(\$1.9)
Sub Total w/o CO ₂ Emissions	(\$63.0)
CO ₂ Emissions Cost / (Savings)	(\$6.9)
Total w/ CO ₂ Emissions	(\$69.9)

* Capital RR - Balance of System includes new and/or avoided generation, transmission, and interconnect capital.

Wimauma Energy Storage Capacity

Cost-Effectiveness Test

Base Fuel Forecast	Cost/(Savings) (2024 US \$ millions)
Capital RR - New Batteries	\$38.7
Capital RR - Balance of System*	(\$19.2)
System FOM	(\$2.5)
System VOM	(\$1.4)
System Fuel	(\$66.1)
Start Costs	(\$2.0)
Sub Total w/o CO ₂ Emissions	(\$52.5)
CO ₂ Emissions Cost / (Savings)	(\$5.7)
Total w/ CO ₂ Emissions	(\$58.2)

* Capital RR - Balance of System includes new and/or avoided generation, transmission, and interconnect capital.

South Tampa Energy Storage Capacity

Cost-Effectiveness Test

Base Fuel Forecast	Cost/(Savings) (2024 US \$ millions)
Capital RR - New Batteries	\$24.3
Capital RR - Balance of System*	(\$9.6)
System FOM	(\$1.4)
System VOM	(\$0.5)
System Fuel	(\$28.1)
Start Costs	(\$1.8)
Sub Total w/o CO ₂ Emissions	(\$17.1)
CO ₂ Emissions Cost / (Savings)	(\$2.5)
Total w/ CO ₂ Emissions	(\$19.6)

* Capital RR - Balance of System includes new and/or avoided generation, transmission, and interconnect capital.

Total Future Solar
Cost-Effectiveness Test

Base Fuel Forecast	Cost/ (Savings) (2024 US \$ millions)
Capital RR - New Solar Units	\$735.5
Capital RR - Balance of System*	\$0.0
PTC Benefit	(\$252.4)
RR Land for Solar	\$30.1
Land Lease	\$34.8
System FOM	\$133.9
System VOM	(\$52.6)
System Fuel	(\$797.5)
Start Costs	\$2.9
Sub Total w/o CO ₂ Emissions	(\$165.3)
CO ₂ Emissions Cost / (Savings)	(\$157.0)
Total w/ CO ₂ Emissions	(\$322.3)

* Capital RR - Balance of System includes new and/or avoided generation, transmission, and interconnect capital.

Future Solar (2024 Projects)

Cost-Effectiveness Test

Base Fuel Forecast	Cost/(Savings) (2024 US \$ millions)
Capital RR - New Solar Units	\$164.7
Capital RR - Balance of System*	\$0.0
PTC Benefit	(\$54.1)
RR Land for Solar	\$0.0
Land Lease	\$9.1
System FOM	\$28.4
System VOM	(\$11.0)
System Fuel	(\$171.5)
Start Costs	\$0.3
Sub Total w/o CO ₂ Emissions	(\$34.0)
CO ₂ Emissions Cost /(Savings)	(\$32.0)
Total w/ CO ₂ Emissions	(\$66.0)

* Capital RR - Balance of System includes new and/or avoided generation, transmission, and interconnect capital.

Future Solar (2025 Projects)

Cost-Effectiveness Test

Base Fuel Forecast	Cost/ (Savings) (2024 US \$ millions)
Capital RR - New Solar Units	\$214.4
Capital RR - Balance of System*	\$0.0
PTC Benefit	(\$77.3)
RR Land for Solar	\$16.7
Land Lease	\$8.3
System FOM	\$41.2
System VOM	(\$16.1)
System Fuel	(\$240.4)
Start Costs	\$0.5
Sub Total w/o CO ₂ Emissions	(\$52.6)
CO ₂ Emissions Cost / (Savings)	(\$47.9)
Total w/ CO ₂ Emissions	(\$100.5)

* Capital RR - Balance of System includes new and/or avoided generation, transmission, and interconnect capital.

Future Solar (2026 Projects)

Cost-Effectiveness Test

Base Fuel Forecast	Cost/(Savings) (2024 US \$ millions)
Capital RR - New Solar Units	\$356.4
Capital RR - Balance of System*	\$0.0
PTC Benefit	(\$121.1)
RR Land for Solar	\$13.5
Land Lease	\$17.3
System FOM	\$64.3
System VOM	(\$25.5)
System Fuel	(\$385.6)
Start Costs	\$2.0
Sub Total w/o CO ₂ Emissions	(\$78.7)
CO ₂ Emissions Cost / (Savings)	(\$77.1)
Total w/ CO ₂ Emissions	(\$155.8)

* Capital RR - Balance of System includes new and/or avoided generation, transmission, and interconnect capital.

English Creek Solar

Cost-Effectiveness Test

Base Fuel Forecast	Cost/(Savings) (2024 US \$ millions)
Capital RR - New Solar Units	\$46.6
Capital RR - Balance of System*	\$0.0
PTC Benefit	(\$12.6)
System FOM	\$6.7
System VOM	(\$1.9)
System Fuel	(\$36.5)
Start Costs	\$0.1
Sub Total w/o CO ₂ Emissions	\$2.3
CO ₂ Emissions Cost /(Savings)	(\$6.8)
Total w/ CO ₂ Emissions	(\$4.5)

* Capital RR - Balance of System includes new and/or avoided generation, transmission, and interconnect capital.

Bullfrog Creek Solar
Cost-Effectiveness Test

Base Fuel Forecast	Cost/(Savings) (2024 US \$ millions)
Capital RR - New Solar Units	\$118.1
Capital RR - Balance of System*	\$0.0
PTC Benefit	(\$41.5)
Land Lease	\$9.1
System FOM	\$21.7
System VOM	(\$9.1)
System Fuel	(\$135.0)
Start Costs	\$0.2
Sub Total w/o CO ₂ Emissions	(\$36.4)
CO ₂ Emissions Cost /(Savings)	(\$25.2)
Total w/ CO ₂ Emissions	(\$61.5)

* Capital RR - Balance of System includes new and/or avoided generation, transmission, and interconnect capital.

Duette Solar

Cost-Effectiveness Test

Base Fuel Forecast	Cost/(Savings) (2024 US \$ millions)
Capital RR - New Solar Units	\$101.7
Capital RR - Balance of System*	\$0.0
PTC Benefit	(\$38.6)
RR Land for Solar	\$16.7
System FOM	\$20.6
System VOM	(\$7.8)
System Fuel	(\$118.2)
Start Costs	\$1.7
Sub Total w/o CO ₂ Emissions	(\$23.9)
CO ₂ Emissions Cost /(Savings)	(\$23.2)
Total w/ CO ₂ Emissions	(\$47.1)

* Capital RR - Balance of System includes new and/or avoided generation, transmission, and interconnect capital.

Cottonmouth Solar
Cost-Effectiveness Test

Base Fuel Forecast	Cost/(Savings) (2024 US \$ millions)
Capital RR - New Solar Units	\$112.7
Capital RR - Balance of System*	\$0.0
PTC Benefit	(\$38.6)
Land Lease	\$8.3
System FOM	\$20.6
System VOM	(\$8.3)
System Fuel	(\$122.2)
Start Costs	(\$1.2)
Sub Total w/o CO ₂ Emissions	(\$28.7)
CO ₂ Emissions Cost /(Savings)	(\$24.7)
Total w/ CO ₂ Emissions	(\$53.4)

* Capital RR - Balance of System includes new and/or avoided generation, transmission, and interconnect capital.

Big Four Solar
Cost-Effectiveness Test

Base Fuel Forecast	Cost/(Savings) (2024 US \$ millions)
Capital RR - New Solar Units	\$103.8
Capital RR - Balance of System*	\$0.0
PTC Benefit	(\$37.7)
Land Lease	\$8.9
System FOM	\$20.2
System VOM	(\$7.8)
System Fuel	(\$124.0)
Start Costs	\$1.3
Sub Total w/o CO ₂ Emissions	(\$35.3)
CO ₂ Emissions Cost /(Savings)	(\$23.6)
Total w/ CO ₂ Emissions	(\$59.0)

* Capital RR - Balance of System includes new and/or avoided generation, transmission, and interconnect capital.

Farmland Solar

Cost-Effectiveness Test

Base Fuel Forecast	Cost/(Savings) (2024 US \$ millions)
Capital RR - New Solar Units	\$81.1
Capital RR - Balance of System*	\$0.0
PTC Benefit	(\$26.3)
RR Land for Solar	\$10.8
System FOM	\$14.3
System VOM	(\$6.2)
System Fuel	(\$82.7)
Start Costs	\$0.8
Sub Total w/o CO ₂ Emissions	(\$8.2)
CO ₂ Emissions Cost /(Savings)	(\$16.6)
Total w/ CO ₂ Emissions	(\$24.8)

* Capital RR - Balance of System includes new and/or avoided generation, transmission, and interconnect capital.

Brewster Solar
Cost-Effectiveness Test

Base Fuel Forecast	Cost/(Savings) (2024 US \$ millions)
Capital RR - New Solar Units	\$51.9
Capital RR - Balance of System*	\$0.0
PTC Benefit	(\$18.7)
RR Land for Solar	\$2.6
System FOM	\$10.2
System VOM	(\$3.5)
System Fuel	(\$54.6)
Start Costs	(\$0.4)
Sub Total w/o CO ₂ Emissions	(\$12.4)
CO ₂ Emissions Cost /(Savings)	(\$11.4)
Total w/ CO ₂ Emissions	(\$23.8)

* Capital RR - Balance of System includes new and/or avoided generation, transmission, and interconnect capital.

Wimauma 3 Solar
Cost-Effectiveness Test

Base Fuel Forecast	Cost/ (Savings) (2024 US \$ millions)
Capital RR - New Solar Units	\$119.5
Capital RR - Balance of System*	\$0.0
PTC Benefit	(\$38.4)
Land Lease	\$8.4
System FOM	\$19.6
System VOM	(\$7.9)
System Fuel	(\$124.4)
Start Costs	\$0.3
Sub Total w/o CO ₂ Emissions	(\$22.8)
CO ₂ Emissions Cost / (Savings)	(\$25.5)
Total w/ CO ₂ Emissions	(\$48.2)

* Capital RR - Balance of System includes new and/or avoided generation, transmission, and interconnect capital.