



Dianne M. Triplett
Deputy General Counsel

October 19, 2020

VIA ELECTRONIC FILING

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

Re: *Petition for a limited proceeding to approve Clean Energy Connection Program and Tariff and Stipulation by Duke Energy Florida, LLC; Docket 20200176-EI*

Dear Mr. Teitzman:

On behalf of Duke Energy Florida, LLC ("DEF"), please find enclosed for electronic filing in the above-referenced docket, DEF's Rebuttal Testimony in Response to the Direct Testimony and Exhibits of Karl R. Rábago. The filing includes the following:

- Rebuttal Testimony of Benjamin Borsch,
- Rebuttal Testimony of Thomas G. Foster; and
- Rebuttal Testimony of Lon Huber with Exhibit No. __ (LH-2).

Thank you for your assistance in this matter. Please feel free to call me at (727) 820 - 4692 should you have any questions concerning this filing.

Respectfully,

/s/ Dianne M. Triplett

Dianne M. Triplett
Dianne.Triplett@duke-energy.com

DMT/cmw
Enclosures

1 BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

2 REBUTTAL TESTIMONY OF

3 BENJAMIN BORSCH

4 ON BEHALF OF

5 DUKE ENERGY FLORIDA

6 DOCKET NO. 20200176-EI

7 October 19, 2020

8 **Q. Please State Your Name and Business Address.**

9 A. My name is Benjamin M. H. Borsch. My business address is Duke Energy Florida,
10 LLC, 299 1st Avenue North, St. Petersburg, Florida 33701.

11
12 **Q. By whom are you employed and what is your position?**

13 A. I am employed by Duke Energy Florida, LLC (“DEF” or the “Company”) as the
14 Director, IRP & Analytics.

15
16 **Q. Have you previously filed testimony in this docket?**

17 A. Yes.

18
19 **Q. Have your duties or responsibilities with the Company changed since you last filed**
20 **testimony in this docket?**

21 A. No.

1 **Q. What is the purpose of your testimony?**

2 A. The purpose of my testimony is to respond to statements made in the testimony of
3 LULAC witness Rabago specifically with regard to the treatment of Renewable Energy
4 Credits (RECs) under the CEC Program, the cost effectiveness of DEF's Clean Energy
5 Connection Program (the CEC Program), and DEF's approach to planning as it applies
6 to this matter. I would note that if I have failed to address any particular point raised
7 by Mr. Rabago, it does not mean that I agree with that statement.

8

9 **Q. Please provide a summary of your testimony.**

10 A. The Commission should approve the CEC Program as filed. The issues raised by
11 Witness Rabago, specifically with regard to the treatment of RECs represent a
12 misstatement of the issues. Witness Rabago confuses the concepts of RECs and
13 emissions offsets. Witness Rabago also suggests that DEF's presentation of the cost
14 benefit analysis is somehow incomplete. It is not and the information filed is consistent
15 with DEF's cost benefit analyses in numerous other filings reviewed and approved by
16 the Commission.

17

18 **Q. Are you sponsoring any exhibits?**

19 A. No.

20

21

22

1 **DEF's Consideration of RECs for the CEC Program is Appropriate and Does Not**
2 **Violate Federal Laws Regarding Deceptive Trade Practices**

3
4 **Q. Please explain the characteristics of RECs and how they are different from**
5 **emissions offsets.**

6 A. RECs convey use of renewable electricity generation and thus underlie renewable
7 electricity use claims and therefore are created and measured in terms of MWh. These
8 are intended to expand consumers' electricity service choices and support renewable
9 electricity development. In some jurisdictions, RECs may have a monetary value
10 where there are mandates for achieving specific targets for renewable energy
11 generation. Emission offsets represent greenhouse gas (GHG) emissions reductions
12 and are measured in equivalent tons of gaseous (usually carbon dioxide) emissions. To
13 the extent that offset certificates may be issued, they provide support for emissions
14 reduction activities and where there are markets for trading them, may lower costs of
15 GHG emissions mitigation.

16 The two concepts are not the same. A REC is a specific attribute associated
17 with renewable generation. A carbon offset represents the impact of a carbon reduction
18 activity. They can be confused, specifically in this instance where renewable
19 generation is offsetting fossil fuel fired generation. Because these two attributes are
20 uniquely different, Mr. Rabago's comments around null energy are misplaced. These
21 two concepts are addressed in a guide published by the U.S. EPA where the differences
22 between these two concepts are described in detail in the U.S. EPA GHG Protocols.¹

¹ U.S. EPA GHG Protocol Project. "Offsets and RECs: What's the Difference?" EPA Green Power Partnership, February 2018, www.epa.gov/sites/production/files/2018-03/documents/gpp_guide_recs_offsets.pdf.

1 As such, DEF is not double counting the RECs and is otherwise appropriately
2 considering environmental attributes in the design of the CEC Program.

3

4 **Q. How does this distinction affect the treatment of the RECs under the CEC**
5 **Program?**

6 A. Under the CEC Program, DEF has provided the participants the option to have the
7 RECs associated with their subscribed blocks placed in their own NAR tracking
8 accounts if the participants are willing to provide notice and pay the transfer fee. This
9 may provide the participants with the transparency and formal tracking mechanism they
10 desire to claim to use renewable electricity from a zero-emitting resource as part of
11 their sustainability goals. By contrast, all DEF customers will benefit from the
12 avoidance of various emissions, including CO₂, from fossil fired generation that is
13 displaced by the energy generated by the CEC Program portfolio. To the extent that
14 those emissions have a cost, as DEF expects they will, under a future regulatory policy,
15 all customers will benefit from the cost reduction associated with the avoided (i.e.
16 offset) emissions.

17

18 **Q. Since the CEC Program allows participants to own the RECs associated with their**
19 **subscriptions, isn't DEF double counting when they also claim a CO₂ benefit for**
20 **the CEC Program?**

21 A. No. The CO₂ benefit described in DEF's cost benefit analysis for this program does
22 not derive directly from the REC created by the renewable generation. Rather it derives
23 from the avoidance of CO₂ emissions associated with fossil fired generation that would

1 occur were it not for the CEC Program generation projects. While DEF does not
2 forecast a specific regulatory framework for these costs, they could be associated, for
3 instance, with CO₂ emissions allowances or with a carbon tax, two structures that have
4 been laid out in proposed legislation.

5

6 **Q. What about the RECs that are tied to the CEC Program blocks that are**
7 **unsubscribed?**

8 A. Contrary to Mr. Rabago's assertions, in the event that there are unsubscribed blocks
9 from the CEC Program portfolio, these portions of the CEC Program will be assigned
10 to benefit all DEF customers just like any other generating asset. As the CEC Program
11 projects are shown to be cost effective, all customers will benefit from this solar
12 generation. To the extent that any RECs associated with unsubscribed blocks from the
13 CEC Program portfolio have monetary value, this value will flow to all customers as a
14 reduction in the cost of generation in the same way as emission allowance reductions,
15 fuel cost reductions and other similar system cost reductions.

16

17 **Q. Based on your testimony here, do you agree with Witness Rabago's assertion that**
18 **DEF's treatment of the RECs presents "a moral hazard" and a potential violation**
19 **of law?**

20 A. No. Witness Rabago conflates RECs and carbon emission offsets in his paradigm to
21 create the "potential" of deceptive practices that simply does not exist in the CEC
22 Program. The CEC Program is very clear on the creation, use, transfer, and ownership

1 of RECs including the use of a transparent, nationally recognized REC registry tracking
2 system.

3

4 **DEF's Cost Effectiveness Evaluation is Complete and Consistent with Prior Proceedings**

5

6 **Q. In Mr. Rabago's Testimony, he describes the record concerning the cost**
7 **effectiveness of the CEC Program "completely undeveloped." How do you**
8 **respond to this?**

9 A. First, I wholly disagree that the record concerning the cost effectiveness of the CEC
10 Program is "completely undeveloped." The data provided with the filing is consistent
11 with the level of detail and information provided with most DEF cost recovery filings,
12 similar to the several filings under the DEF SoBRA program. That said, it is normal
13 for Commission staff to request significant discovery in these matters and in this
14 instance, both Staff and LULAC have served discovery requests to which DEF is in the
15 process of responding.

16

17 **Q. Can you elaborate on some of the details used in developing the cost effectiveness**
18 **demonstration that Mr. Rabago considers "underdeveloped"?**

19 A. Yes. Consistent with the approach DEF uses in the demonstration of cost effectiveness
20 for a number of projects, DEF assembles two cases, one with the proposed project, in
21 this instance the portfolio of the CEC Program solar generating units and one without
22 the proposed project. In the latter case, the generating capacity necessary to make up
23 the deficit from removing the CEC Program generating units is filled with an optimal

1 configuration of conventional generating units, primarily gas fired combustion
2 turbines. The two cases are compared on the basis of the Cumulative Present Value
3 Revenue Requirements (CPVRR).

4 Mr. Rabago identifies three particular areas of the savings which he questions:
5 fuel savings, carbon costs, and conventional generation costs. I will address each of
6 these items and explain why Mr. Rabago's assertions are incorrect. First, regarding the
7 fuel savings benefit, due to the presence of the CEC Program solar generating units,
8 the amount of fuel consumed in the CEC Program case is substantially lower than in
9 the no-CEC Program case. DEF uses an industry accepted production cost model,
10 PROSYM, a part of the ABB Planning and Risk suite, to project the system production
11 costs over the 30-year life of the CEC Program assets. One of the key inputs to this
12 model is the fuel cost. DEF's fuel price assumptions in this filing are consistent with
13 those in the 2020 Ten-Year Site Plan and are shown in Exhibit BMHB-2.

14 DEF's base case fuel price forecast was developed using short-term and long-
15 term spot market price projections from industry-recognized sources. The base cost
16 for coal in the near term is based on existing contracts and spot market coal prices and
17 transportation arrangements between DEF and its various suppliers. For the longer
18 term, the prices are based on spot market forecasts reflective of expected market
19 conditions. Oil and natural gas prices are estimated based on current and expected
20 contracts and spot purchase arrangements as well as near-term and long-term market
21 forecasts. Specifically, for natural gas DEF uses five years of NYMEX forward spot
22 price curves and then transitions over a five-year period to a fundamentally driven
23 forecast. Natural gas firm transportation cost is determined primarily by pipeline tariff

1 rates. For the low and high fuel price scenarios, DEF developed ranges of natural gas
2 and coal prices around the reference forecast based on the range of prices seen in the
3 Energy Information Administration’s high price (Low Oil and Gas Resource and
4 Technology Case) and low price (High Oil and Gas Resource and Technology Case)
5 forecasts.

6 Given that the prices of natural gas and coal are currently at historically low
7 levels, it is reasonable that the spread of high and low prices would be asymmetric with
8 a greater “upside” risk in the price. In a system portfolio, solar power acts as a fuel
9 price hedge. In the event that fuel prices rise, the solar power provides increasing
10 savings. If, as Mr. Rabago suggests could happen, fuel prices decrease significantly,
11 the value of the solar price decreases, but it does so in an environment in which the
12 total price to the customer is decreasing. In the low fuel price sensitivity compared to
13 the mid or reference fuel price case, the fuel savings is reduced by \$126 million in
14 CPVRR. However, this occurs in an environment in which customers are still saving
15 over \$700 million in fuel costs and in which the total fuel expenditure for the fleet is
16 reduced by over \$3 billion in CPVRR compared to the reference projection.

17 The second input which Mr. Rabago addresses is the cost of carbon. The CO₂
18 allowance price projections used in this filing are also DEF’s latest projections used in
19 the development of the 2020 TYSP. DEF projects a cost of carbon sufficient to force
20 changes in operation and future technology adoption required to meet the Duke Energy
21 goal of achieving a 50% reduction in emissions from the 2005 baseline by 2030 and to
22 reach a net-zero CO₂ footprint by 2050. To create this price forecast, Duke Energy
23 estimated the CO₂ reductions that would be required to meet this goal and used Duke

1 Energy's production cost modeling tools to create an estimate of the costs that would
2 be incurred to meet those reduction targets. In the absence of actual market information,
3 Duke Energy assumed that the emissions reduction costs would be representative of
4 the market and that these costs could be used as a proxy for CO₂ emission prices. Based
5 on the set reduction targets, DEF and its customers could incur these costs either
6 through increased operating costs to achieve the reductions, through allowance
7 purchases or a "carbon tax." From the standpoint of total system cost and CPVRR,
8 these would yield effectively the same result.

9 DEF recognizes that there is today no specific regulatory policy which restricts
10 carbon dioxide emissions or places a specific cost on them. DEF projects the likelihood
11 that this cost will materialize and the savings which would be associated with avoiding
12 these costs. As has been common practice in its filings for over ten years, DEF breaks
13 out the cost savings ascribed to the reduction in carbon emissions as a separate line
14 item to make it transparent how the project cost benefit evaluation would look without
15 these savings. As shown in Exhibit BMHB-3, the selection of the option with the CEC
16 Program project portfolio is cost effective in both the mid and high fuel price scenarios.
17 Only in the low fuel price scenario with no CO₂ emission cost is the no-CEC option
18 less cost effective by \$25 million in CPVRR, although, as noted above, this occurs in
19 a circumstance in which the customer's cost of fuel is over \$3 billion less than it is in
20 the reference fuel price case. As discussed in regard to the fuel cost, the additional
21 solar generation acts as a hedge against future CO₂ emissions costs.

22 The third item Mr. Rabago raises is the savings in conventional generation
23 costs. As I mentioned earlier, DEF assembles two resource plans, one with and one

1 without the CEC Program solar generation portfolio. These plans are developed using
2 System Optimizer, an industry recognized capacity expansion modeling tool which is
3 also part of the ABB Planning and Risk suite of tools. The two resource plans are
4 shown in Exhibit BMHB-4. DEF is a summer planning utility. The solar generation
5 from the planned CEC units provide an initial capacity benefit of 427 MW (57% of the
6 nameplate capacity) at the time of the summer peak. This capacity results in the
7 deferral of combustion turbines that would otherwise be projected to be needed
8 throughout the 30-year life of the solar units and in the end is projected to eliminate the
9 need for one of the projected combustion turbines. The fixed and capital costs for these
10 units are calculated including the direct costs of the units, the associated transmission
11 upgrades, projected fixed operating costs and the costs of fixed gas transportation
12 charges. The costs for each resource plan are compared on a CPVRR basis resulting
13 in a savings of \$353 million for the case including the CEC Program solar generating
14 portfolio. Mr. Rabago notes that the filing does not include a commitment by DEF not
15 to build a combustion turbine per se. This is true. All the units identified in the resource
16 plan are projected and may or may not be selected or constructed in the future.
17 However, the presence of the CEC Program solar generation portfolio will reduce
18 DEF's need for additional generating capacity in the future and can be expected to
19 result in a reduction in the future need for combustion turbine capacity.

20

21 **Value of DEF's Commitment to Consider Third-Party Projects**

22 **Q. Is there an opportunity for competitive power developers to participate in the**
23 **CEC Program?**

1 A. Yes. While DEF will own and operate all the CEC Program solar generation power
2 plants, DEF will consider projects in development by third parties for acquisition
3 depending on the attributes of those projects including location, position in the
4 interconnection queue, required transmission upgrades, community acceptance,
5 environmental permitting status, and other factors. DEF's commitment to
6 consideration of third-party projects is detailed in Mr. Matt Stout's direct testimony
7 and the Stipulation included with DEF's Petition.

8

9 **Q. Why does DEF feel it is important to maintain ownership of all the CEC Program**
10 **solar power plants?**

11 A. The rate design of the CEC Program specifically includes certain elements to make the
12 program appealing to potential participants and to DEF's general body of customers
13 (e.g., net cost to participate, payback period, and impacts to general body of customers).
14 As a result, DEF needs to have a high degree of certainty and control over the project
15 criteria and reliable performance in order to keep the program on target consistent with
16 customer demand and expectations. Unexpected variations in costs and, in particular,
17 uncertainty in annual solar production per project, or risks to the in-service date of the
18 projects, will damage the program, risking a failure to meet the commitment to
19 customers, and thereby greatly reduce its chance of success. As such, DEF is working
20 with in-house and third-party developers to develop, construct and operate a portfolio
21 of low-cost and cost-effective solar projects that will provide the greatest certainty for
22 the performance of the CEC Program.

23

1 **Q. Does that conclude your testimony?**

2 **A. Yes.**

3

1 BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

2 REBUTTAL TESTIMONY OF

3 THOMAS G FOSTER

4 ON BEHALF OF

5 DUKE ENERGY FLORIDA

6 DOCKET NO. 20200176-EI

7 October 19, 2020

8

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

10 A. I am employed by Duke Energy Florida (“DEF” or the “Company”) as Director of
11 Rates and Regulatory Planning.

12

13 **Q. Have you previously filed testimony in this docket?**

14 A. Yes, I provided direct testimony on July 1, 2020.

15

16 **Q. Have your duties or responsibilities with the Company changed since you last**
17 **filed testimony in this docket?**

18 A. No.

19

20 **Q. What is the purpose of your testimony?**

21 A. The purpose of my testimony is to rebut four specific matters that Witness Rabago, on
22 behalf of the League of United Latin American Citizens of Florida, raises in direct
23 testimony with respect to DEF’s proposed Clean Energy Connection Program (CEC

1 Program). Those four items are: 1) the Florida Power & Light Company's (FPL's)
2 SolarTogether case should not decide issues in the proceeding given the relative size
3 of the utilities; 2) the CEC Program violates traditional rate making; 3) the amount of
4 CEC Program administrative costs; and 4) the CEC Program is not fair to non-
5 participants and grants undue preference to program participants. I would note that if
6 I have failed to address any particular point raised by Mr. Rabago, it does not mean that
7 I agree with that statement.

8

9 **Q. Please provide a summary of your testimony.**

10 A. The Commission should approve DEF's CEC Program as filed, with no modifications.
11 Mr. Rabago's claims are unfounded and do not warrant any changes to the CEC
12 Program. As discussed below, the CEC Program is not twice as large as FPL's
13 SolarTogether program; rather, as addressed more thoroughly by Witness Huber, it is
14 sized based on customer demand and with their needs in mind. Similarly, Mr. Rabago's
15 claims about ratemaking are untrue. Under the CEC Program, the general body of
16 customers do not pay for any fixed revenue requirements over the life of the Program
17 since participants are paying 104.9% of the fixed revenue requirements via their
18 subscription fee. This is a \$39.2M benefit to the general body of customers. Further,
19 there is no undue preference to CEC Program participants, because the participants are
20 paying a fixed subscription fee that is projected to more than cover the fixed costs of
21 the CEC Program. Finally, my testimony clarifies that there is no confusion regarding
22 the amount of administrative costs; rather the amount included in the direct filing is
23 stated as a nominal cost figure and a revenue requirement figure.

1 **Q. Are you sponsoring any exhibits?**

2 A. No.

3

4 **Q. On Page 7, lines 13 – 19, of Witness Rabago’s testimony he states that the recently**
5 **Commission approved FPL’s SolarTogether program should not be used to decide**
6 **issues in this proceeding. Do you agree with this assertion?**

7 A. No. First, Witness Rabago fails to acknowledge that FPL’s SolarTogether has all the
8 same fundamental features he decries while also ignoring the innovative add-ons DEF
9 made to the proposed CEC Program. DEF designed the CEC Program so that, as
10 compared to the FPL SolarTogether program, the participants bear a greater percentage
11 of the costs and the general body of customers share in a greater percentage of the
12 benefits of the CEC Program. Specifically, DEF's general body of customers receive
13 87.3% of the benefits while FPL's general body of customers receive 45%. Second, I
14 do not agree that DEF’s CEC Program is twice as big as FPL’s program given the
15 relative size of the utilities. DEF’s CEC Program is relatively bigger but not twice as
16 big, and it was sized based on feedback from customers as discussed more fully by
17 DEF Witness Huber. Third, what Witness Rabago goes on to explain is that the relative
18 rate impact in the year with the highest negative impact is about twice as high of an
19 impact for DEF’s CEC Program as compared to FPL’s program. While the rate impact
20 is not twice as high based on the math Mr. Rabago shows in his Note 5, the impact for
21 DEF is higher. However, he fails to mention that DEF’s impact is also higher in the
22 years where there is a favorable rate impact, given that DEF’s program provides \$2.9B
23 in favorable net revenue requirements to the general body of customers compared to

1 FP&L's \$1.8B, when considering the entire period. Witness Rabago seems to base his
2 assertion that the FPL program and DEF's CEC Program are not similar enough to
3 merit similar regulatory treatment on an assertion based on a difference in rate impact
4 in a single year. While DEF agrees this is a consideration the FPSC can take into
5 account, using Witness Rabago's own numbers the average monthly impact in the year
6 with the highest impact to the general body of customers is on average ~\$0.88 per
7 month higher for the CEC Program than for SolarTogether. This is a far cry from a
8 dramatic difference and is overwhelmed by the additional favorability in the latter years
9 of the program. For the above reasons I believe Witness Rabago's assertion is flawed
10 and irrelevant.

11

12 **Q. On Page 15, lines 22 – 24, to page 16, lines 1- 12 of Witness Rabago's testimony**
13 **he implies that DEF's program is structured to require non-participants to**
14 **subsidize wealthy and profitable businesses and claims that DEF wants to price**
15 **solar program subscriptions at below cost and that it violates traditional cost of**
16 **service rate making in a most fundamental way. Do you agree with Witness**
17 **Rabago's claim?**

18 A. No. Under traditional ratemaking processes, the cost of new generation is recovered
19 from the general body of customers as a rate increase that is offset by the benefits
20 (typically avoided costs that result from the addition of the new generation) that
21 decreases rates over the life of the new generating asset. DEF's CEC Program design
22 allows for the sharing of the benefits of the voluntary Program between the participants
23 and general body of customers while the full cost of the Program is paid for by the

1 participants over the program life. The intent of this feature is to allow both participants
2 and the general body of customers to benefit from the environmental and financial
3 benefits that result from the addition of new solar generation to the DEF system. The
4 general body of customers do not pay for any fixed revenue requirements since
5 participants are paying 104.9% of the fixed revenue requirements via their subscription
6 fee. This is a \$39.2M benefit to the general body of customers. The general body of
7 customers also receive \$425.9M on a CPVRR basis of the variable revenue requirement
8 benefits, yielding a total CPVRR of \$465.1M or 87.3% of the total program benefits.
9 Participants will pay 104.9%, or \$833.4M on a CPVRR basis, of the fixed revenue
10 requirements and are expected to receive approximately \$901.0M in variable revenue
11 benefits, yielding a CPVRR of \$67.6M or 12.7% of the total program benefits.

12

13 **Q. Do you agree with Mr. Rabago's testimony where he states that the timing and**
14 **shares of benefits and costs associated with DEF's CEC Program proposal is not**
15 **fair to non-participants and grants undue preference to program participants?**

16 A. No. Witness Rabago states that in the years 2021 – 2028 non-participating customers
17 must pay an added \$336M in rates while during the same period of time the participants
18 will be ahead by \$3M. First, it should be noted that participants are part of the general
19 body of ratepayers and they are paying their portion of the \$336M Witness Rabago
20 cites over the 2021-2028 timeframe. So, it is more accurate to say that participants will
21 pay their portion of the \$336M in that timeframe and will receive a slight benefit from
22 the net of bill credits and subscription fees (\$2.2M, not the \$3M Witness Rabago
23 claims). Second, Witness Rabago appears to be intentionally short-sighted in his

1 analysis. Although he clearly states in his testimony that non-participants realize over
2 the life of the Program about \$2.9B in savings, he focuses his analysis on a period of
3 time from 2021 – 2028 rather than the entire life of DEF’s CEC proposal. When stating
4 that the program grants undue preference to participants, he fails to recognize that the
5 participants are paying a fixed subscription fee that is projected to more than cover the
6 fixed costs of the Program. This is consistent with the recently approved Solar
7 Together program and it can be seen in Exhibit KKR-3 of Witness Rabago’s testimony
8 that if you add up the same numbers over the 2020-2027 timeframe for FPL you will
9 see the General Body of Customers paying ~\$500M while participants pay their share
10 of that but receive a slight benefit of ~\$5M from the net of the subscription credits and
11 subscription charges. Therefore, the Commission has clearly considered this structure
12 before and determined that it is not unfair to non-participants.

13

14 **Q. On Page 20, lines 7 – 15, of Witness Rabago’s testimony he states there is some**
15 **confusion in the petition regarding administrative costs. Do you agree with**
16 **Witness Rabago’s statement?**

17 A. No. There is no confusion regarding the projected administrative costs for the CEC
18 Program. The approximate \$16.5M in administrative costs referenced by Witness
19 Huber refers to the program administration costs. As stated in Witness Huber’s
20 testimony, the administration costs include “labor for one program manager and one
21 specialist, IT expenses to implement the program in the billing system and on the
22 website, marketing and REC registration fees charged by NAR.” My direct testimony
23 included a figure of \$16.8M, which represents the revenue requirement associated with

1 the approximate \$16.5M administrative costs in nominal terms. Therefore, the figure
2 included in my testimony is a nominal revenue requirement number which includes
3 some return associated with a minimal amount of IT capital, while Witness Huber's
4 number is the cost number before converting to a revenue requirement.

5

6 **Q. Does that conclude your testimony?**

7 A. Yes.

1 BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

2 REBUTTAL TESTIMONY OF

3 LON HUBER

4 ON BEHALF OF

5 DUKE ENERGY FLORIDA

6 DOCKET NO. 20200176-EI

7 October 19, 2020

8

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

10 A. I am employed by Duke Energy Business Services, LLC (“Duke Energy”). My role is
11 Vice President, Rate Design and Strategic Solutions. In this capacity, I am responsible
12 for rate design and pricing for all of Duke Energy’s affiliated utility operating
13 companies, including Duke Energy Florida (“DEF” or the “Company”).

14

15 **Q. Have you previously filed testimony in this docket?**

16 A. Yes. I filed direct testimony.

17

18 **Q. Have your duties or responsibilities with the Company changed since you last**
19 **filed testimony in this docket?**

20 A. No.

21

22 **Q. What is the purpose of your testimony?**

1 A. To address the concerns that League of United Latin American Citizens' (LULAC)
2 Witness Rabago raised in his testimony and give further information to the Commission
3 about the Clean Energy Connection Program (CEC Program) described in the initial
4 petition.

5
6 **Q. Please provide a summary of your testimony.**

7 A. In my testimony I respond to many of the inaccuracies stated by Witness Rabago who
8 paints the CEC Program to be unfair. I discuss how DEF's program was designed with
9 shared renewable best practices in mind and was crafted to match a similar program
10 recently approved by this Commission, while specifically tailoring it to serve our
11 customers. The CEC Program allows customers who cannot or do not want to put solar
12 on their premise to still participate in a clean energy transition, while allowing the
13 Company to collect 104.9% of the fixed revenue requirement from these customers by
14 including a modest financial benefit that accrues over time. Strong participation
15 commitments from customers thus far prove to DEF that customer demand exists in its
16 service area for a carbon free generation program that empowers participants to achieve
17 their sustainability goals while saving every DEF customer money over time. Thus,
18 the program is in the public interest and should be approved. I would note that if I have
19 failed to address any particular point raised by Mr. Rabago, it does not mean that I
20 agree with that statement.

21

22 **Q. Are you sponsoring any exhibits?**

23 A. Yes, I sponsor one exhibit:

1 • Exhibit No. __ (LH-2), Interstate Renewable Energy Council Community Solar
2 Checklist.

3 This exhibit is true and accurate.
4

5 **DEF's CEC Program Provides for Broad Participation by Customers and is Additive**
6 **and Complementary to Net Metering**

7 **Q. Witness Rabago characterizes the CEC Program as a defensive move for DEF to**
8 **keep large customers from self-generating. Is that true?**

9 A. No. Mr. Rabago creates a narrative that there are a few large corporations who will
10 benefit and goes as far as to state it is a “corporate hand-out program”¹. This dramatic
11 narrative does not reflect reality. Of the 30 customers who have pre-subscribed to the
12 program, 22 are tax-exempt local governments, schools, and healthcare organizations.
13 They are not wealthy corporations. When these organizations save money on their
14 electricity bills, they are able to put that money to work in other programs for the public
15 good. There are thousands of additional small businesses and residential customers,
16 including low-income customers, who will save a modest sum over decades while
17 achieving their goal of using renewable energy through the CEC Program when they
18 otherwise may not have been able to do so because of upfront costs or lack of suitable
19 space for onsite solar. Remember that just 1 MW of solar capacity requires up to 5
20 acres. The average local government request was 11 MW. If a town has that much
21 land for solar use, they typically need that land for other purposes. In the alternative,
22 solar parking shade structures introduce significant engineering, steel, installation and

¹ Rabago Testimony, pg. 12, ln. 7.

1 maintenance costs well above utility ground-mount systems. Perhaps Mr. Rabago said
2 it best that “the utility can pursue the most cost-effective resources (solar).”² The CEC
3 Program as proposed does exactly that and looks to share benefits with all DEF
4 customers over time.

5
6 **Q. Witness Rabago appears concerned that the CEC Program could harm net**
7 **metering uptake. What is your response?**

8 A. I disagree. The financial comparison Witness Rabago makes illustrates that he lacks
9 even a basic understanding of adopter economics for either the CEC Program or net
10 energy metering (NEM). Moreover, Witness Rabago’s position is in stark conflict to
11 the stated objectives of his client.

12 “LULAC wants to ensure that the transition to clean, renewable energy
13 is conducted in an equitable fashion that does not disproportionately
14 burden low-and moderate income communities.”³

15

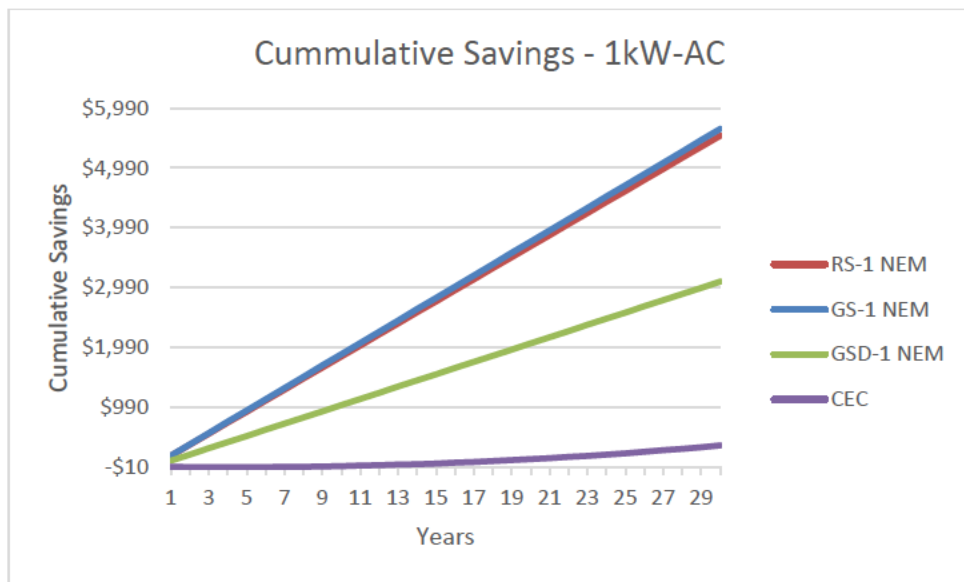
16 **Q. Please explain why Witness Rabago’s financial comparison reflects a lack of**
17 **understanding regarding adopter economics for either the CEC Program or**
18 **NEM.**

19 A. First, if we look at cumulative savings on DEF bills of 1 kW of net metered solar for
20 various customer classes compared to cumulative savings for a 1 kW subscription in
21 the CEC Program, the difference is apparent. Even when accounting for the fact that 1
22 kW of CEC solar is estimated to produce 160% more energy than that of 1 kW rooftop

² Rabago Testimony, pg. 17, ln. 14.

³ Rabago Testimony, pg. 4, Ln 9-11.

1 solar, a residential customer will accrue 15 times more in bill credits over 30 years of
2 NEM, as compared to the credits that same customer would accrue in the CEC Program.
3 This is a simple savings calculation that does not account for installation costs,
4 Operation & Maintenance (O&M) costs, or any changes in DEF rates. The following
5 graph overlays the cumulative savings of 1 kW NEM in three DEF rate scenarios – RS-
6 1, GS-1, GSD-1 – with savings in the CEC Program over 30 years. Cumulative savings
7 associated with the CEC Program are much lower than NEM cumulative savings.



8
9 Another way to look at the difference in magnitude of savings is to compare the
10 CEC Program with simple net savings for a 50 kW-AC NEM system on the GS-1 rate.
11 When factoring in the federal tax credit, a conservative estimate of cumulative net
12 savings for this NEM system on GS-1 over 30 years is nearly \$155,000. It would take
13 a 30.1 kW CEC Program subscription to achieve that same usage offset and would save
14 the CEC Program participant a little over \$10,800 over the entire 30 period of the
15 program. Even when factoring in for system installation costs, the difference between
16 cumulative net savings of 30 years of NEM vs. the CEC Program is dramatic.

1 In addition, Witness Rabago is concerned that the CEC Program offers a
2 “payback” of just 7 years, arguing that is more attractive than NEM because “it
3 outperforms traditional net-metering in the vast majority of states.”⁴ What Mr. Rabago
4 fails to realize is that this is an apples-and-oranges comparison. The net-metering
5 “payback” that Mr. Rabago is referring to is substantially different from the CEC
6 Program “payback” I discussed in my direct testimony. The NEM payback that
7 Witness Rabago alludes to is associated with what is generally referred to as a “cash-
8 purchase” - a substantial up-front investment in the tens of thousands of dollars made
9 by the solar adopter. The “payback” occurs with the accumulation of savings from
10 offsetting payments derived from kWh credits against DEF rates and applicable taxes
11 with net-metered solar. In the case of the CEC Program, there is no up-front
12 investment or cash outlay to be paid back.

13 Instead, the CEC Program offers the opportunity to participate and benefit from
14 renewable solar energy for what some might say is “zero-down.” However, the CEC
15 Program participant (except for low-income participants) will pay more initially than
16 if they did nothing. It is only over 7 consecutive years in the CEC Program that a
17 participant will see their cumulative savings from credits surpass the initial increase
18 in their costs due to subscription fees, which I referred to as the “payback.” A much
19 more apt comparison to make would be to compare the CEC Program to other “zero-
20 down” solar options widely available, such as net-metered residential solar loans and
21 leases. In these zero-down finance scenarios, the participant has solar installed at their
22 premise with no up-front investment from them, but rather a monthly payment to the

⁴ Rabago Testimony, pg 19, ln 16.

1 solar company for the rooftop PV system. It is generally understood within the
2 industry – and extensively marketed as such – that these net-metered solar finance
3 arrangements save the participant in total monthly energy expenses from day one. In
4 other words, the solar adopters’ residual DEF bill immediately after installing solar,
5 plus their solar finance payment, is less than their non-solar DEF bill would have been.
6 Taking the comparison to its logical conclusion, this results in a NEM adopter payback
7 of 0 years for “zero-down” solar, or in a sense instantaneously upon parallel system
8 operation with supplemental service under DEF’s net metering tariff. In terms of
9 adopter economics, the CEC Program does not compare favorably to the more apt
10 comparison with other zero-down solar options available either.

11 Actual analysis of accurate, available and generally understood market
12 economics for solar adopters in DEF territory paints a decidedly different picture than
13 that proffered by Witness Rabago. By any reasonable comparison of adopter
14 economics with NEM, the CEC Program is not only not in the same ballpark; it can
15 hardly be thought of as the same sport. Thus Mr. Rabago’s allegation that the CEC
16 Program is a threat to NEM, and his accusation that the CEC Program is an “abuse of
17 market power”⁵ are simply untrue.

18
19 **Q. Please explain why Witness Rabago’s position conflicts with his client’s**
20 **objective.**

21 A. Witness Rabago implies that any reduction to the adoption of net metered solar is a
22 negative outcome to all DEF customers, though one can assume his concern is that of

⁵ Rabago Testimony, pg. 19, ln. 18

1 low-to-moderate-income non-participants. He does so consistently and without
2 providing any analysis whatsoever, let alone analysis specific to Florida, DEF, or the
3 CEC Program, while making claims that (net-metered) “self-generation” is a truly cost-
4 effective and unsubsidized renewable energy supply. Throughout, Witness Rabago lists
5 aspects of the CEC Program he deems as “manifestly unfair” to non-participants, yet
6 ignores the implication of the NEM policy he implicitly favors. In direct conflict with
7 Mr. Rabago’s testimony, traditional net metering, particularly on flat volumetric rates,
8 itself: a) does not confer non-participants with renewable energy attributes; b) has non-
9 participants on the hook for administrative costs; c) does not allow participants to
10 cancel, reduce or transfer their participation at their pleasure; d) leaves non-participants
11 no choice but to pick up any costs that result from the NEM policy; and d) only provides
12 the promise of future “benefits” that may or may not accrue to non-participants. Finally,
13 the most glaring omission is the fact that many low-to-moderate income communities
14 either do not have suitable roof and solar access, cannot afford custom private solar
15 systems, rent their premises, and/or do not have the credit to finance or lease a PV
16 system. Therefore, a policy such as NEM that forces non-participants in low-to-
17 moderate-income communities to pay for a program that provides null energy for
18 uncertain benefits that they themselves largely cannot participate in is Witness
19 Rabago’s defacto preferred policy. This is in stark contrast to the CEC Program which
20 enables wide participation regardless of economic status or living arrangement,
21 provides unparalleled participant flexibility, costs over 50% less to install, and
22 produces significantly more energy per kW, all to the benefit of participants and non-
23 participants alike.

1 **Q. Was the CEC Program designed to stop net metering in any way?**

2 A. Definitely not. From my experience in the industry, customers who want to net meter
3 do so partly because they want to reduce the energy purchased from DEF at their
4 premise, and partly because they want that visual representation of their commitment
5 to renewable energy on their property, among other reasons. No offsite renewable
6 program can compete with that. However, the CEC Program is designed to allow DEF
7 retail customers who cannot or do not want to put solar on their premise, to participate
8 in a clean energy transition, especially those generally precluded from net metering,
9 often low-to-moderate-income customers.

10

11 **The CEC Program Appropriately Utilizes Anchor Customers**

12 **Q. Witness Rabago takes issue with the use of Anchor Customers, please explain why**
13 **DEF designed the program so that Large Customers would have the first**
14 **opportunity to participate?**

15 A. DEF maintains that large customers provide DEF with the surety it desires in order to
16 move forward with the Program as what I have referred to as “Anchor Customers.”
17 Customers reserving large portions of the program reduce program administration
18 expenses, thus providing more in terms of economic benefits to themselves and smaller
19 customers. For instance, there was very little in the way of marketing expense to the
20 large customers and local governments, and DEF will collect well over \$11MM from
21 these customers in the first year alone. If DEF instead needed to employ direct
22 marketing tactics to subscribe the entire program, its marketing expense would be
23 significantly higher. Mr. Rabago’s mall analogy (claiming that DEF is using anchor

1 tenants to attract smaller tenants) fails, as demonstrated above. In particular, DEF did
2 not use anchor customers to attract smaller customers. Anchor customers are an
3 accepted practice and encouraged within the shared renewables community.
4

5 **DEF's CEC Program Meets Community Solar Standards**

6 **Q. Witness Rabago testifies that the CEC Program does not adhere to the Interstate**
7 **Renewable Energy Council (IREC) standards of community solar programs**
8 **design. Do you agree with that?**

9 A. I do not. Witness Rabago references the standards set in 2013. DEF utilizes the 2018
10 guidance which now contains seven standards instead of four. They are now many
11 pages in length therefore I am not including the entire list here. In my attached Exhibit
12 No. __ (LH-2), I have included the complete Checklist for Voluntary Utility-Led
13 Community Solar Programs as published by IREC. Below is a brief summary of the
14 key ideals and how DEF incorporated them into the CEC Program:
15

16 1. **Expand Customer Access to Clean Energy.** The CEC program meets this
17 principle. DEF conducted market research to set program features. The CEC
18 Program allows all customer classes to participate and sets maximum subscription
19 sizes. The low-income customer carve out of 26 MW ensures cross socioeconomic
20 participation and much thought has gone into making the program easy in which to
21 enroll and understand, both for customers and for the community partners we intend
22 to work with to promote the program.

- 1 2. **Offer Tangible Economic Benefits for All Participating Customers.** The CEC
2 Program saves customers money on their electric bills. The credit values are
3 significant enough to support a successful program. Participants will receive fair
4 compensation for their value of their blocks to the grid. Fees and credits will appear
5 on the participant’s monthly bill.
- 6 3. **Identify Ways to Promote Project Development Cost Savings.** The scale and
7 DEF’s solar asset development experience will help contain costs. The CEC
8 Program solar portfolio development will aim to minimize interconnection costs,
9 minimize environmental impacts and costs, achieve low cost constructability of the
10 sites, utilize key equipment suppliers providing quality materials while optimizing
11 each project’s unique design criterion to maximize cost savings.
- 12 4. **Prioritize the Customer Experience.** Program development considered the
13 customer’s journey in every step of the CEC Program. From the online application
14 to the enrolled participant portal online, the CEC Program gives customers the
15 ability to self-serve as much as they want. DEF’s Renewable Service Center will
16 be available for customers who prefer to speak with a representative to enroll or ask
17 questions. Large customers told us they were surprised at how easy it was to enroll
18 and how straight forward the disclosures were. Low-income customer enrollment,
19 often a significant barrier to entry, does not involve a customer needing to go
20 somewhere to have their income verified. Participants will be able to view monthly
21 program fees and credits on their monthly bill.

1 5. **Promote Competition.** DEF, as a normal course of business, issues competitive
2 solicitations for the engineering, procurement and construction of its solar plants,
3 looking at both local job creation and minority participation in its criteria.

4 6. **Optimize Community Solar to Benefit the Grid and the Community.**
5 Seventeen local governments have signed up to participate in the CEC Program to
6 ultimately lower their electricity bills so they can put those funds to other needs in
7 the community, claim renewable electricity use and potentially qualify for clean
8 energy grants⁶ for their community. In addition, as part of this program, DEF will
9 publish a study within two years analyzing an add-on program that would allow
10 participants to employ storage technologies.

11 7. **Complement Existing Programs.** As set forth in the Stipulation, DEF has
12 committed to “Market the CEC Program to participants in its low-income efficiency
13 offerings in order to maximize savings and ease enrollment for these customers.”
14 This is consistent with the IREC standard that utilities should encourage customer
15 participation in energy efficiency measures.

16
17 A detailed review of the updated standards shows that the CEC Program does, in
18 fact, meet the standards. In addition, some of the criticisms Witness Rabago raises
19 against the CEC Program are actually aspects promoted by IREC. IREC endorses the
20 use of scale to provide tangible economic benefits, using government subsidy programs
21 to determine low-income eligibility and use of the utility as a backstop for unsubscribed
22 capacity in order to maintain economic benefits for subscribers. It is not surprising that

⁶ https://www.stpete.org/internal-news-detail_T2_R1009.php

1 DEF's CEC Program meets these IREC standards, because, as shown on my Exhibit
2 No. __ (LH-2), Vote Solar was involved with developing these standards and Vote
3 Solar is a signatory to the Stipulation.

4
5 **Q. There are well established models for providing shared renewable programs to**
6 **customers. Why did DEF choose to set up the program this way?**

7 A. DEF is looking for ways to cost-effectively decarbonize its fleet and help customers
8 achieve their sustainability goals as well. That is going to require innovation. Doing
9 things how they have always been done is not going to get DEF or customers where
10 they want to be in a carbon reduced future. DEF and many of its stakeholders view
11 this model as a way to achieve both of those goals. In designing this program, DEF
12 conducted extensive outreach and to my knowledge the only non-profit community
13 stakeholder that objects to this program is LULAC.

14
15 **Q. Witness Rabago believes that the CEC program creates an unfair subsidy for**
16 **participants from non-participants. Do you agree with that characterization?**

17 A. No. As detailed in Exhibit No. __(TGF-1) submitted by DEF in the Direct Testimony
18 of Witness Foster, non-participants experience a net savings in 9 years, although that
19 includes year 1, before systems are operational. In terms of contribution to the solar
20 plants, participants will pay 104.9% of the fixed program costs with the general body
21 of customers receiving 87.3% of the benefits. In FPL's recently Commission-approved
22 SolarTogether program, non-participants only shared in 45% of the benefits and the
23 program participants paid a slightly lower percentage of the base revenue requirement

1 at 104.5%. Where Witness Rabago sees unfair allocation of benefits to large customers
2 and local governments, DEF sees those groups as paying an amount greater than the
3 solar plant construction and O&M expense, to receive fair compensation for the value
4 of their subscribed capacity on the grid.

5

6 **DEF's Design of the Low-Income Portion of the CEC Program is Appropriate**

7 **Q. How did DEF determine the percentage of the program capacity that would be**
8 **reserved for low-income customers?**

9 A. In discussion with stakeholders and considering the scale of this program, DEF
10 determined to allocate 26 MW to low-income customers. DEF made the low-income
11 carve out the same as the percentage of customers who are eligible for low-income
12 energy efficiency programs. DEF does not track sales by customer income therefore
13 that methodology was not considered.

14

15 **Q. Witness Rabago does not think the low-income allocation is open to all low-income**
16 **customers. Is that correct?**

17 A. No. The CEC Program is open to all low-income customers.

18

19 **Q. Why is eligibility for the low-income allocation tied to participation in any**
20 **government subsidy program?**

21 A. DEF set this eligibility criteria to remove a very significant barrier to entry for low-
22 income customers, which is proving their income to qualify for the CEC Program.
23 Customers can leverage the fact that they have already gone through that process for

1 other low-income programs. DEF's intent is to make the enrollment process as easy as
2 possible for the customer while easing administrative burden where prudent. We hope
3 to pre-identify customers living in subsidized housing, for instance, using government
4 databases so that when customers start the enrollment process, we already know they
5 qualify, and they have to do nothing. We also plan to partner with apps used for low
6 income government assistance programs like Fresh EBT, which is only accessed by
7 customers who participate in that program. If a customer comes to the DEF website
8 from that app, we know the customer is already qualified to participate and they can
9 easily sign up. For customers who we need to show proof of eligibility, we will have
10 the ability for them to upload a picture of it. A lot of thought and planning is going in
11 to making the enrollment process an easy one for low-income customers.

12

13 **Conclusion**

14 **Q. Should the Commission approve the CEC Program, and the Stipulation, as filed?**

15 A. Yes. For all the reasons included in DEF's Petition, the Stipulation, and the direct and
16 rebuttal testimonies. The CEC Program is a cost-effective program for all DEF
17 customers and should be approved.

18

19 **Q. Does that conclude your testimony?**

20 A. Yes.



A Checklist for Voluntary Utility-Led Community Solar Programs

A Guide to Evaluate and Inform Program Design and Implementation



Vote Solar and the Interstate Renewable Energy Council, Inc.

November 2018

COMMUNITY SOLAR projects provide multiple subscribers with on-bill benefits directly attributable to that particular solar project, interconnected at the distribution level. In addition, community solar programs should result in additional incremental renewable energy resources on the distribution grid that otherwise would not have been procured by the utility to serve all customers.



Community solar now accounts for one gigawatt of installed capacity and has the potential to scale to 50-80 times that size by 2030¹, bringing widespread benefits to customers, communities, the economy and the environment. The U.S. community solar market is growing rapidly, driven by both state policy and voluntary utility programs (i.e., those programs not required by state law). Even in states that have not statutorily authorized community solar programs, all electric utilities have the option to offer voluntary programs for their customers. Nationwide, over 220 utilities offer community solar programs across 36 states, and a growing number of rural electric cooperatives, municipal utilities, and investor-owned utilities are exploring or implementing community solar program offerings². Key motivations for these voluntary programs include rising customer demand for renewable energy, providing economic benefits to low- to moderate-income (LMI) customers and underserved communities, and diversifying the energy resource mix, among others.

Across the country, voluntary utility-led program offerings vary in terms of program design, structure, administration, and customer participation. In addition, company governance and regulation differ by utility, which means program development, review and the amount of non-utility stakeholder input and oversight can vary. The ability for utilities to design programs well-suited to meet their unique situations and respond to their customers' interests is important to achieve program success. However, despite their

¹ GTM Research, *The Vision for U.S. Community Solar: A Roadmap to 2030*, July 2018, available at: <http://www.votesolar.org/csvision>.

² Chwastyk, Dan, *From consumer interest to fully subscribed programs: SEPA report drills into details of community solar success*, Smart Electric Power Alliance, May 2018, available at: <https://sepapower.org/knowledge/from-consumer-interest-to-fully-subscribed-programs-sepa-report-drills-into-details-of-community-solar-success/>.



diversity, many of these programs would benefit from a common framework to improve customer understanding and acceptance of community solar and help ensure community solar can scale more quickly and cost-efficiently.

This checklist, developed by Vote Solar and the Interstate Renewable Energy Council (IREC), both national non-profit organizations, is intended to help guide utility officials and other stakeholders interested in creating new utility-led community solar programs (or those seeking to improve existing programs). Based on established practices and successful program models, this checklist reflects the program design considerations critical to supporting effective community solar programs that appeal to and benefit their customers and communities.

The goal of this checklist is to inform and guide voluntary utility-led community solar program design, such that existing and future programs adopt replicable and scalable attributes that are customer focused and support high rates of participation and capacity deployment. In addition, this checklist can help drive innovative implementation strategies that ensure more customers can access and benefit from program offerings, including those that have not traditionally benefited from on-site solar programs. The checklist focus on utility-led community solar programs is not intended to imply or recommend that these should be the only programs made available. Rather, this checklist aims to highlight the key program design considerations and provide recommendations to align programs with proven practices to replicate successes across diverse markets.

The checklist is organized into seven categories, with priority issues for program design identified within each category. The most important issues for successful programs are indicated with a blue circle. Lastly, although not articulated as a separate item in the checklist, all programs should undergo periodic review to address identified weaknesses and improve the program offering for customers.





1. EXPAND CONSUMER ACCESS TO CLEAN ENERGY

Community solar is a proven way to expand solar access to all Americans, regardless of income level or housing type. It is a critical and necessary consumer offering to meaningfully provide consumer access to clean energy, particularly for renters and underserved communities.

Establish and clearly articulate program goals and intended participants.

- Unless there is a specific goal to serve only LMI customers, affordable housing properties and/or other underserved communities, any project should allow all customer classes (e.g., residential, small commercial, large commercial, industrial, low-income, moderate-income etc.) to participate in a community solar offering.●
- Ensure multiple subscribers and different customer classes (if applicable) can benefit from a single community solar array.●
 - Establish a maximum subscription size (e.g., one customer may not subscribe to more than 40% of the project capacity).
 - Set participation goals for small customers (residential, small commercial) to ensure that larger customers do not subscribe for the majority of program capacity (e.g., set a goal that 40% of the project should be reserved for subscriptions of 25 kW or less).
- Conduct preliminary market research to understand customers' primary motivations for participating in a community solar program and use that to inform program design and prioritize the most compelling elements as part of the community solar offering (e.g. system location, specific ownership models, subscription terms, and customer education, marketing and outreach strategies).●



Ensure that the program is appropriately sized to meet customer demand and achieve overall goals. Program capacity limits set too low may not sufficiently expand consumer access to clean energy.[•]

- Include an annual process for program evaluation, assessment, and adjustment in conjunction with interested stakeholders. The annual program evaluation process should include, at minimum:[•]
 - an assessment of available capacity;
 - the opportunity for additional capacity to meet customer demand;
 - the customer value proposition;
 - the current subscriber mix;
 - the effectiveness of marketing, education and outreach strategies;
 - and the opportunity to allow non-utility providers to reach as many customers as possible.

Set participation targets for LMI customers, affordable housing providers and tenants, tenants living in multifamily housing and disadvantaged communities. These participation targets should also include a minimum goal for low-income residential participation (e.g., 20% of the program capacity should be allocated to LMI projects with at least 10% dedicated to low-income households).^{•3}

- Adopt targeted program design provisions to increase LMI participation (e.g., carve-outs or targets).[•]

Address barriers for program participation by LMI customers, affordable housing providers and tenants, tenants living in multifamily housing and disadvantaged communities.^{•3,4}

- Create new or leverage existing mechanisms to address the financial barriers to participation faced by LMI customers such as: ^{•3,4}
 - direct or indirect incentives;

³ For more information on targeted program design provisions to facilitate participation by underserved communities see Vote Solar & GRID Alternatives Low Income Solar Policy Guide available at: <https://www.lowincomesolar.org> and REC's Shared Renewables for Low to Moderate Income Consumers: Policy Guidelines and Model Provisions available at: <https://irecusa.org/publications/shared-renewable-energy-for-low-to-moderate-income-consumers-policy-guidelines-and-model-provisions/>

⁴ For more information on financing barriers and supportive interventions for low income community solar projects see the Sustainable Capital Advisors inclusive Solar Finance Framework report available at: <https://votesolar.org/policy/policy-guides/low-income-solar-access/inclusive-solar-finance-framework/> listed in the resources section

- subscriptions with no upfront costs;
- on-bill financing;
- alternative credit criteria;
- loan-loss reserve.

Create a plan for community outreach and education to ensure customers are aware of and understand the program.

- Partner with community-based organizations on education, outreach, and engagement efforts to increase customer participation, particularly among the lower income customers.

Establish streamlined interconnection processes.

- If utility-led programs are engaging third-party developers, then uniform standards, fees, and interconnection processes should be in place to facilitate project development.⁵



2. OFFER TANGIBLE ECONOMIC BENEFITS FOR ALL PARTICIPATING CUSTOMERS

The majority of customers are interested in solar as a way to save on energy costs.⁶ In other words, community solar should not be viewed as a premium product. Therefore, it is critical that any community solar offering provide tangible economic benefits for all participating customers. Individuals, households, businesses and institutions that receive energy cost savings will be inclined to maintain their subscription over the life of the community solar project.

⁵ For additional information on streamlined interconnection processes see REC's *Model Interconnection Procedures and Priority Interconnection Considerations Memo* available at: <https://irecusa.org/publications/model-interconnection-procedures/>

⁶ Smart Electric Power Alliance and Shelton Group *What the Community Solar Customer Wants*, August 2016 available at: <https://seppower.org/resource/what-the-community-solar-customer-wants/> [According to the report 65 percent of households are interested in solar because they want lower monthly energy costs]



The following program design elements and specific recommendations should be considered to provide tangible economic benefits to community solar subscribers:

Structure the subscription offering for customers in a way that provides near-term and long-term economic benefits for all subscribers.

- Individual subscribers should receive a credit on their electric utility bill as a dollar-per-kilowatt hour credit that reflects their community solar subscription.[•]
- The value of the credit should either be value based capturing the full benefits of distributed generation for the services and benefits it provides, total applicable retail rate minus a reasonable delivery charge that takes transmission and distribution benefits into account, or equal to the applicable retail rate.^{•7}
- The value of the credit shall be sufficient to reasonably allow for the creation, financing and accessibility of community solar facilities to ensure robust customer participation, and be provided for the useful life of the community solar project but not less than 25 years.[•]
- Subscriptions or participation in the program that are at a premium do not meet best practices.^{•8}

Eliminate upfront costs associated with any subscription.[•]

- Offer a “pay-as-you-go” subscription model to eliminate the upfront investment barrier to going solar.⁹
- Eliminate any upfront deposits or sign-up fees. If a utility requires these, they should either be refundable or applied to buy down the subscription cost.

7 For more information on bill credit valuation see the following resources: Coalition for Community Solar Access’s *Community Solar Policy Decision Matrix*, available at: http://www.communitysolaraccess.org/community_solar_policy_decision_matrix_2017/; and REC’s *Model Rules for Shared Renewable Energy Programs* available at: https://irecusa.org/publications/model_rules_for_shared_renewable_energy_programs/.

8 Any community solar program should be structured in a way that provides tangible economic benefits to subscribers. Offerings at a cost premium fail to meet best practices.

9 An upfront per panel purchase option can be offered alongside the “pay as you go” subscription model.

Ensure LMI and other underserved customers receive significant energy bill savings that can be realized immediately. •

- LMI and other underserved customers must receive immediate savings to facilitate program participation.
- LMI customers should be able to participate in the program at no upfront cost. •
- Identify low-cost financing options and explore the potential for local grants or philanthropic funding.
- Explore opportunities to serve as a “backup subscriber” or facilitate the purchase of solar on behalf of low-income customers to help create an immediate value proposition to LMI participants.
- Facilitate the participation of other large entities as backup subscribers and/or “anchor tenants” to help offer tangible economic benefits for LMI households and other underserved communities.

Identify an appropriate provider of last resort so that if subscription rates drop temporarily, the amount of unsubscribed energy is minimized and the economic value of the community solar project is maintained. •

- Allow a municipal or other institutional customer’s subscription to temporarily exceed the customer’s average monthly usage if the customer serves as a backup subscriber, meaning the customer fills a gap in subscriptions in the event of default by one or more customers.
- The utility or anchor tenant should serve as the provider of last resort.



3. IDENTIFY WAYS TO PROMOTE PROJECT DEVELOPMENT COST SAVINGS

Any utility-led program should evaluate ways to create a cost-effective community solar project, so that any cost savings can be passed down to individual subscribers. To do this, utilities should:

Explore opportunities to reduce project development costs to provide greater economic benefits to subscribers.

- Pursue time- and cost-efficient land acquisition strategies for multiple projects.

- Identify ways to maximize economies of scale to offer tangible economic benefits.
 - Install a single, large community solar facility (at least 1 MW in size) or multiple, smaller installations (portfolio approach).¹⁰

- Reference Section V to find ways to promote market competition to reduce overall project development costs.



4. PRIORITIZE THE CUSTOMER EXPERIENCE

Customer-centric community solar offerings are critical for successful programs that attract and retain subscribers, while also providing meaningful benefits to participants. Though customer preferences may vary across utilities, voluntary community solar programs should:

- A community solar project and all of its subscribers must be sited within the utility's electric service territory.¹⁰

- Build transparency and consumer protection into community solar program administration.
 - Provide a clear, easy-to-understand disclosure form for customers that highlights key contract terms and other program details that is available in multiple languages.¹¹

¹⁰ As indicated in the SEPA and Shelton Group report entitled *What the Community Solar Customer Wants* (available in the Resources section of this report) 51% of commercial customers prefer “visible” projects that do not cost a premium and residential customers highly value “visibility and access to production information”

¹¹ See New York and Minnesota’s consumer disclosure forms. NY’s disclosure form is available here: [http://www3.dps.ny.gov/WJ/PSCWeb_nsf/96f0fec0b45a3c6485257688006a701a/eab5a735e908b9fe8525822f0050a299/\\$F LE/New%20York%20Community%20Dis-tributed%20Generation%20Disclosure%20Form6_1_18_docx](http://www3.dps.ny.gov/WJ/PSCWeb_nsf/96f0fec0b45a3c6485257688006a701a/eab5a735e908b9fe8525822f0050a299/$F LE/New%20York%20Community%20Dis-tributed%20Generation%20Disclosure%20Form6_1_18_docx); MN’s form is available here: https://www.cleanenergyresourceteams.org/sites/default/files/CSG_Disclosure_Checklist_2017.pdf.

- Provide customers with clear and transparent subscription information on their bill including, at minimum:
 - kilowatt-hours generated,
 - the value of that generation,
 - billing period costs and savings,
 - cumulative costs and savings.



Streamline subscriber management, billing and communication processes.

- Use billing software versus more inefficient manual billing techniques to make the subscriber management and associated billing more efficient.
- Initiate regular customer outreach and engagement about the program and any complementary programs.

Provide attractive and flexible subscription terms and payment options to appeal to a variety of customer preferences.

- Flexible subscription terms should include:
 - A variety of subscription types, which could include an upfront per panel purchase option but also must include a monthly subscription-based offering, frequently called “pay-as-you-go.”
 - Option for on-bill repayment and/or on-bill financing to make it easier and more economical for customers to participate. •
 - No or low upfront costs (any upfront costs should be refundable or applied to the overall subscription cost).
 - Short subscription lengths: Subscribers should be able to participate on a month-to-month basis. If that is not possible, then the program should only require a minimal participation term of 1 year.
 - Portability and transferability: customers should be allowed to take their subscription with them if they move within the utility service territory (portability), or transfer their subscription if they leave the program or move out of the service territory (transferability).
 - No or low cancellation fees: If cancellation or termination fees are included in a customer’s subscription, they should be waived if the subscriber has exceeded a minimum term (e.g. 1 year).



5. PROMOTE COMPETITION

Utilize competition to create the most cost efficient and consumer-focused community solar project.

Promote participation by third-party providers to drive cost savings, innovation, and competition.

- Issue a competitive solicitation for the engineering, procurement, and construction of the solar array.
- Encourage participation by third-party providers for project financing, such as a pass-through Power Purchase Agreement.
- Encourage participation by third-party providers for program design, customer education and outreach, customer acquisition and billing support.
- Ensure that no undue preference is given to certain solar providers to maintain a competitive marketplace.
- Include a preference for using local labor at prevailing wages.



6. OPTIMIZE COMMUNITY SOLAR TO BENEFIT THE GRID AND THE COMMUNITY

As a distributed resource, community solar has the opportunity to provide additional benefits to the distribution grid. Community solar programs present an opportunity for utilities to strategically incorporate these distributed solar projects in a way that maximizes benefits the system, and the community, as a whole.

Identify opportunities to increase grid benefits through strategic project siting or pairing with other technologies and programs.

- Locate community solar projects in strategic areas on the grid to maximize locational value and avoid more constrained locations.

- Evaluate opportunities to combine community solar with energy storage or demand response programs.
- Evaluate the opportunity for sectionalizing equipment or switches to create microgrids capable of emergency operations in stand-alone mode.

Incorporate community solar into broader grid resiliency strategies or microgrid projects.

- Evaluate community solar in long-term integrated distribution resource planning to optimize cost-effective deployment over time.

Prioritize local community benefits in addition to grid benefits.

- Develop projects on brownfields, landfills, in and around environmental justice communities or other unused land.
- Partner with local institutions, such as local governments or school districts, to build projects that could reduce their energy costs.
- Partner with community groups to site a community solar array in a disadvantaged community.



7. COMPLEMENT EXISTING PROGRAMS

Community solar can meet renewable energy compliance targets at low costs, combine with other energy efficiency programs to reduce household energy burden, and lift up communities through workforce development. These programs provide a unique opportunity to explore complementary measures.

Make the community solar program additive so that it results in additional renewable energy resources on the distribution grid that otherwise would not have been procured by the utility to serve all customers.¹²



Where possible, encourage customer participation in complementary energy efficiency offerings, demand response or time-of-use rates to help further reduce customers' energy costs and energy usage, especially for participating LMI customers.



Explore creative partnerships with other state programs and/or community organizations to support skills training, workforce development, and community education.

Provide a community solar option for individuals on energy assistance funding or utilizing a utility rate discount subsidy. Explore leveraging energy assistance funding to support new community solar programs.



Use existing programs, such as LIHEAP, to qualify low-income customers for community solar.

¹² Any program using existing clean energy facilities would not qualify as a true community solar program

RELEVANT RESOURCES

National Shared Renewables Scorecard (IREC)

Launched by IREC in May 2017 and updated annually, the Scorecard evaluates state shared renewables programs using criteria based on best practices for program design.

<https://sharedrenewablescorecard.org/>

Low-Income Solar Policy Guide (GRID Alternatives & Vote Solar)

This guide provides information on various policies and programs that are creating access to solar technology and jobs nationwide. The community solar page also identifies successful strategies to ensure low-income participation.

<http://www.lowincomesolar.org><http://www.lowincomesolar.org>

Shared Renewables for Low- to Moderate-Income Consumers: Policy Guidelines and Model Provisions (IREC)

This report provides information and tools for policymakers, regulators, utilities, shared renewable energy developers, program administrators and others to support the adoption and implementation of shared renewables programs specifically designed to provide tangible benefits to LMI individuals and households. The guidelines and accompanying model provisions are intended to function in tandem with IREC's existing Model Rules for Shared Renewable Energy Programs. Both available at:

<https://irecusa.org/publications/shared-renewable-energy-for-low-to-moderate-income-consumers-policy-guidelines-and-model-provisions/> and <https://irecusa.org/publications/model-rules-for-shared-renewable-energy-programs/>

Expanding Solar Access: Pathways for Multifamily Housing (IREC)

In this guide, local governments, housing providers, utilities and other stakeholders can learn about on-site and off-site shared renewable energy programs and how those programs can offer greater solar access for renters, multifamily residents and low-to-moderate income consumers in their communities.

<https://irecusa.org/expanding-solar-access-pathways-for-multifamily-housing/>

Bringing the Benefits of Solar Energy to Low-Income Consumers (Clean Energy States Alliance)

This guide outlines the obstacles that low-income households face in accessing solar power and provides a detailed overview of strategies that policymakers and government agencies can use to encourage low-income solar adoption.

<http://www.cesa.org/resource-library/resource/bringing-the-benefits-of-solar-energy-to-low-income-consumers>

Inclusive Solar Finance Framework (Sustainable Capital Advisors)

In this report, we outline a framework that policymakers, advocates, the solar industry, community groups, and financial organizations can use to think more broadly about ways to achieve greater equity as the nation transitions to a cleaner energy economy.

<https://votesolar.org/policy/policy-guides/low-income-solar-access/inclusive-solar-finance-framework/>

Community Solar Program Models Report (Smart Electric Power Alliance (SEPA))

This report, funded by the US Department of Energy Solar Energy Technologies Office Solar Market Pathways Initiative, provides insights and information on community solar market development, including which kinds of community solar programs are gaining traction with cooperatives, municipal utilities, and investor-owned utilities.

<https://sepapower.org/resource/community-solar-program-designs-2018-version/>

Community Solar Policy Decision Matrix (Coalition for Community Solar Access)

This policy decision matrix provides an overview of important community solar program design questions, a menu of options, recommendations, and other important issues to consider for those designing and implementing programs.

<http://www.communitysolaraccess.org/community-solar-policy-decision-matrix-2017/>

Community Solar Value Project

This site includes a comprehensive on-line Solutions library and additional resources on solar plus battery storage or demand response, aimed primarily as a resources for utilities. It was developed with support from the U.S. Department of Energy Solar Market Pathways Initiative.

<https://www.communitysolarvalueproject.com>

What the Community Solar Customer Wants (SEPA and Shelton Group)

The most successful community solar programs are designed with the customer in mind. But what does a community solar customer want? The Shelton Group and SEPA conducted a nationwide survey involving over 2,000 respondents to help answer this question. This report provides quantitative results of the survey and touches on customer preferences, how these preferences vary among different customer segments, and delves into the relative importance of various model attributes.

<https://sepapower.org/resource/what-the-community-solar-customer-wants/>

Community Solar: Best Practices for Utilities in the South (Southern Environmental Law Center)

SELIC's Solar Initiative Policy Brief highlights best practices for utility-sponsored community solar. The document covers on-bill crediting, enrollment requirements, credit rate, REC treatment, siting and several additional considerations for utility-led offerings.

https://www.southernenvironment.org/uploads/publications/CommSolar_Utility_Best_Practices.PDF

Community Solar for the Southeast Implementation Guide (North Carolina Clean Energy Technology Center)

This guide examines several issues related to community solar, focusing specifically on the unique issues faced by electric cooperatives and municipal utilities in the southeast.

<https://nccleantech.ncsu.edu/wp-content/uploads/Community-Solar-for-the-Southeast-Implementation-Guide.pdf>



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