

September 3, 2019

Mr. Adam Teitzman  
Director, Office of Commission Clerk  
Florida Public Service Commission  
2540 Shumard Oak Blvd.  
Tallahassee, FL 32399

*Via electronic filing*

Re: Docket No. 20190061-EI

Dear Mr. Teitzman:

Attached for filing are the testimony and exhibits MC-1 and MC-2 of Matt Cox, who is testifying on behalf of Vote Solar.

Thank you for your assistance in this matter. Please do not hesitate to contact me if you have any questions.

Sincerely,

*/s/ Marsha E. Rule*

Marsha E. Rule

Cc: See attached Certificate of Service

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition for approval of FPL  
SolarTogether program and tariff, by Florida  
Power & Light Company.

Docket No. 20190061-EI

DATED: September 3, 2019

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the testimony and exhibits of Matt  
Cox have been served by electronic mail to the following on September 3, 2109:

Kenneth A. Hoffman  
Florida Power & Light Company  
134 W. Jefferson Street  
Tallahassee, FL 32301  
[Ken.hoffman@fpl.com](mailto:Ken.hoffman@fpl.com)

Maria Jose Moncada  
Florida Power & Light Company  
700 Universe Boulevard  
Juno Beach, FL 33408  
[Maria.moncada@fpl.com](mailto:Maria.moncada@fpl.com)

J. R. Kelly  
Stephanie A. Morse  
Office of Public Counsel  
c/o The Florida Legislature  
111 W Madison Street, Room 812  
Tallahassee, FL 32399  
[Kelly.jr@leg.state.fl.us](mailto:Kelly.jr@leg.state.fl.us)  
[Morse.stephanie@leg.state.fl.us](mailto:Morse.stephanie@leg.state.fl.us)

Walter Trierweiler  
Kristen Simmons  
Florida Public Service Commission  
2540 Shumard Oak Blvd.  
Tallahassee, FL 32399-0850  
[wtrierwe@psc.state.fl.us](mailto:wtrierwe@psc.state.fl.us)  
[ksimmons@psc.state.fl.us](mailto:ksimmons@psc.state.fl.us)

Jon C. Moyle, Jr.  
Karen A. Putnal  
Ian E. Waldick  
Florida Industrial Power Users Group  
Moyle Law Firm, PA  
118 N Gadsden Street  
Tallahassee, FL 32301  
[jmoyle@moylelaw.com](mailto:jmoyle@moylelaw.com)  
[kputnal@moylelaw.com](mailto:kputnal@moylelaw.com)  
[iwaldick@moylelaw.com](mailto:iwaldick@moylelaw.com)

George Cavros  
Southern Alliance for Clean Energy  
120 E. Oakland Park Blvd., Suite 105  
Fort Lauderdale, FL 33334  
[george@cavros-law.com](mailto:george@cavros-law.com)

Stephanie U. Eaton  
Carrie Harris Grundmann  
SPILMAN THOMAS & BATTLE, PLLC  
110 Oakwood Drive, Suite 500

Derrick Price Williamson  
SPILMAN THOMAS & BATTLE, PLLC  
1100 Bent Creek Boulevard, Suite 101  
Mechanicsburg, PA 17050

Winston-Salem, NC 27103  
[seaton@spilmanlaw.com](mailto:seaton@spilmanlaw.com)  
[cgrundmann@spilmanlaw.com](mailto:cgrundmann@spilmanlaw.com)

[dwilliamson@spilmanlaw.com](mailto:dwilliamson@spilmanlaw.com)

*/s/ Marsha E. Rule*  
\_\_\_\_\_  
Marsha E. Rule

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition for approval of FPL SolarTogether program and tariff, by Florida Power & Light Company. | DOCKET NO. 20190061-EI  
FILED: September 3, 2019

**DIRECT TESTIMONY**

**OF**

**MATT COX, PhD**

**ON BEHALF OF VOTE SOLAR**

Richard A. Zambo  
Richard A. Zambo, P.A.  
Fla. Bar No. 312525  
2336 S.E. Ocean Boulevard, #309  
Stuart, Florida 34966  
richzambo@aol.com  
Phone: 772.225.5400

Marsha E. Rule  
Rutledge Ecenia, P.A.  
Fla. Bar No. 0302066  
119 South Monroe Street, Suite 202  
Tallahassee, Florida 32301  
marsha@rutledge-ecenia.com  
Phone: 850.681.6788

*Attorneys for Vote Solar*

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20

**DIRECT TESTIMONY**  
  
**OF**  
  
**MATT COX, PhD**  
  
ON BEHALF OF VOTE SOLAR  
  
BEFORE THE  
  
FLORIDA PUBLIC SERVICE COMMISSION  
  
20190061-EI

**I. INTRODUCTION AND QUALIFICATIONS**

**Q. PLEASE STATE YOUR NAME, TITLE AND BUSINESS ADDRESS.**

A. My name is Matt Cox. I am the Chief Executive Officer at the Greenlink Group Inc., located at 695 Pylant Street NE, Suite 110, Atlanta, GA 30306.

**Q. PLEASE DESCRIBE THE GREENLINK GROUP.**

A. The Greenlink Group (Greenlink) is an energy technology, research and consulting firm that specializes in energy policy analysis. Greenlink provides evidence and expert analysis needed to evaluate pressing issues in energy markets, especially those concerning the evolution of the electric grid. We focus on the integration and alignment of centralized and distributed energy resources, energy efficiency in buildings and manufacturing, demand side management (DSM), and modernizing these approaches for future applications. Greenlink has engaged in energy policy arenas from the local to the international scale, working

1 with public and private sector clients to design smarter data-driven policies and  
2 strategies.

3 **Q. PLEASE DESCRIBE YOUR PROFESSIONAL AND EDUCATIONAL**  
4 **EXPERIENCE.**

5 A. I am the co-founder and current Chief Executive Officer for Greenlink, where I  
6 have led our team's research work for the past five years. A comprehensive  
7 review of my experience and qualifications is described in my *curriculum vitae*  
8 attached as Exhibit MC-1. Generally, we focus on energy issues at the city and  
9 state level, advising clients on policies and programs to maximize energy savings  
10 and economic efficiency. Frequently, this involves the utilization of Greenlink's  
11 machine learning modeling tools and our application of other advanced  
12 technology to the energy policy landscape.

13 I hold a PhD in Energy Policy from the Georgia Institute of Technology, with a  
14 minor in sustainable development. I was a National Science Foundation Fellow in  
15 Nanostructured Energy Storage and Conversion, as well as a founding member of  
16 the Climate and Energy Policy Laboratory at Georgia Tech. I also hold a Master's  
17 of Science degree in Public Policy in Energy and Environmental Policy, with a  
18 focus on economic development from Georgia Tech. My Bachelor of Science is  
19 from the University of Dayton. I have published over 60 research studies,  
20 primarily on energy efficiency and renewable energy policy.

21 **Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE AS IT**  
22 **RELATES TO CLEAN ENERGY POLICIES AND PROGRAMS.**

1 A. I have researched, designed, drafted, implemented, and evaluated renewable  
2 energy and energy efficiency policies across the United States. I have assisted  
3 cities, states, public service commissions, U.S. Department of Energy and its  
4 National Laboratories, the Energy Information Administration, as well as  
5 nonprofits and NGOs, in crafting more effective energy policy proposals and best-  
6 in-class program designs. Additionally, I have testified before state legislatures,  
7 public service commissions, and city councils on these topics.

8 **Q. ON WHOSE BEHALF ARE YOU APPEARING?**

9 A. I am appearing on behalf of Vote Solar.

10 **Q. ARE YOU SPONSORING ANY EXHIBITS?**

11 A. Yes. I am sponsoring the following exhibits:

- 12 ● Exhibit MC-1, which is a summary of my experience and qualifications.
- 13 ● Exhibit MC-2, which is a map of customer electricity burdens in FPL's  
14 service territory.

15 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

16 A. The purpose of my testimony is to assess the strengths and shortcomings of the  
17 SolarTogether program as proposed and to suggest improvements to the design of  
18 the program for all customers.

19 **Q. PLEASE SUMMARIZE YOUR TESTIMONY.**

1 A. SolarTogether is a promising program that, if approved, will likely be the largest  
2 utility-sponsored solar subscription offering in the nation.<sup>1</sup> The benefits from  
3 expanded solar generation for the State of Florida are many; more solar power can  
4 reduce the cost of electricity while improving public health and the economy. In  
5 fact, solar is now the cheapest generating source available to FPL.<sup>2</sup> The  
6 SolarTogether program is also in a position to set the standard for voluntary clean  
7 energy offerings by Florida electric utilities for the next decade or longer. As  
8 such, it raises significant public policy questions that bear careful consideration,  
9 especially regarding access and affordability for those customers who currently  
10 lack clean energy options.

11 It is clear that the addition of these solar resources comes with real and  
12 quantifiable benefits – in the form of cleaner energy, cleaner air, reduced  
13 greenhouse gas emissions, and financial savings. The question at issue is how  
14 those benefits should be apportioned between FPL, its shareholders, subscribing  
15 customers, and customers as a whole; and fundamentally, whether the program is  
16 essentially designed to benefit FPL first – and then to unduly favor certain  
17 customers over others – with the result of shutting out those customers who are  
18 most in need of bill relief from solar savings. The current design would primarily  
19 benefit FPL shareholders and those customers who can wait for benefits to

---

<sup>1</sup> Valle, Matthew. *Florida Power and Light Company, Direct Testimony of Matthew Valle*,  
*Docket No. 20190061-El*. July 29, 2019. *Before the Florida Public Service Commission*. At 5.

<sup>2</sup> Determined by using the NREL ATB levelized cost of energy with reported FPL fuel prices as  
applicable. NREL (National Renewable Energy Laboratory). 2019. *2019 Annual Technology  
Baseline*. Golden, CO: National Renewable Energy Laboratory.  
<https://atb.nrel.gov/electricity/2019>.



1 materialize over the course of years while excluding most other customers from  
2 accessing the financial benefits of increased solar deployment in the state.

3 I recommend that FPL take advantage of the savings opportunity that solar  
4 presents to its shareholders and all of its customers to deliver a fairer division of  
5 the benefits than is accomplished by the current program design. As it stands, a  
6 disproportionate share of the benefits are reserved for the shareholders, large  
7 commercial customers, and wealthier residential customers while leaving out the  
8 over 2 million FPL residential customers who suffer with higher-than-average  
9 energy burdens and the 1.4 million customers who live in energy poverty.<sup>3</sup> This  
10 unfair result, which would only serve to further exacerbate the significant  
11 disparities in energy burdens in Florida, is not in the public interest and unwisely  
12 squanders the opportunity that low-cost solar provides. With some relatively  
13 minor adjustments, the program can be a winning proposition for all stakeholders,  
14 demonstrate serious leadership and distinguish the program for more than just its  
15 sheer size.

16 To realize this potential, the Commission should require FPL to either set aside or  
17 expand its program by 100 MW of SolarTogether capacity to provide an  
18 opportunity for at least 20,000 of FPL's low-income customers to participate and

---

<sup>3</sup> Energy burden is the percent of household income dedicated to paying energy bills. As used in this testimony, the term is referring to electricity burdens specifically. Household energy bills are “unaffordable” or a household is in “energy poverty” when electricity bills exceed 6% or total energy bills exceed 10% of household income. *See* Fisher Sheehan & Colton. 2013. “Home Energy Affordability Gap.” Available at [www.homeenergyaffordabilitygap.com/](http://www.homeenergyaffordabilitygap.com/). Heindl, P. 2015. “Dynamic Properties of Energy Affordability Measures.” *Energy Policy* 86: 123–32.; Hernández, D., and S. Bird. 2010. “Energy Burden and the Need for Integrated Low-Income Housing and Energy Policy.” *Poverty and Public Policy* 2 (4): 5–25.

1 reduce their annual electric bills by 10% or more. There are a number of options  
2 to achieve this level of savings, including providing the subscription benefit as a  
3 direct kWh offset, and by pairing the subscription with energy efficiency  
4 improvements. In all circumstances, the program should at a minimum  
5 incorporate a hold-harmless provision to empower low-income customers to  
6 participate in solar and produce a better future for their communities without fear  
7 that they may further stress their finances.

8 Finally, the Commission should require more thorough analysis from FPL for any  
9 unconstructed capacity within Phase 1 as well as any future phases of the  
10 SolarTogether program, including vetting power purchase agreements as a means  
11 of adding utility-scale solar capacity at a lower cost to ratepayers, consideration of  
12 a performance-based incentive to drive low-income participation, and requiring  
13 FPL to determine the optimal amount of utility-scale solar to add in order to  
14 maximize the benefit to ratepayers.

15 **III. WHETHER THE ADDITION OF 1,490 MW OF SOLAR IS IN THE**  
16 **PUBLIC INTEREST.**

17 **Q. WHAT SHOULD THE COMMISSION CONSIDER IN DETERMINING**  
18 **WHETHER TO APPROVE, MODIFY OR REJECT THE**  
19 **SOLARTOGETHER PROGRAM?**

20 A. There are two important questions for the Commission to weigh with respect to  
21 this program. First, is the addition of 1,490 megawatts of incremental solar  
22 resources to the rate base in the public interest? And second, are the rates offered  
23 under this program designed in a way that is fair and reasonable, without giving

1 any undue or unreasonable preference or disadvantage to any person?<sup>4</sup> I will  
2 address these questions in turn.

3 **Q. IS ADDING MORE SOLAR TO THE GRID, AS THIS PROGRAM**  
4 **WOULD DO, IN THE PUBLIC INTEREST?**

5 A. Yes. A number of analyses show that solar is the least-cost source of new  
6 generation in Florida. For example, two recent data products from the Department  
7 of Energy National Laboratories show that utility-scale solar is the least-cost  
8 resource on a levelized basis for the state (beating out natural gas) and that under  
9 optimized planning, 10 gigawatts of utility-scale and distributed solar would be  
10 added to Florida's grid for the next decade (notably, these would be the *only*  
11 capacity additions over the next decade as well) (See Figure 1, below).<sup>5, 6</sup> FPL's  
12 modeling in this filing demonstrating net benefits of \$139 million over the life of  
13 these solar additions, the most current Ten Year Site Plan and FPL's recently  
14 announced 30-by-30 proposal<sup>7</sup> all suggest that FPL also sees additional solar as a  
15 highly cost-effective option to meeting the future energy needs of its customers.

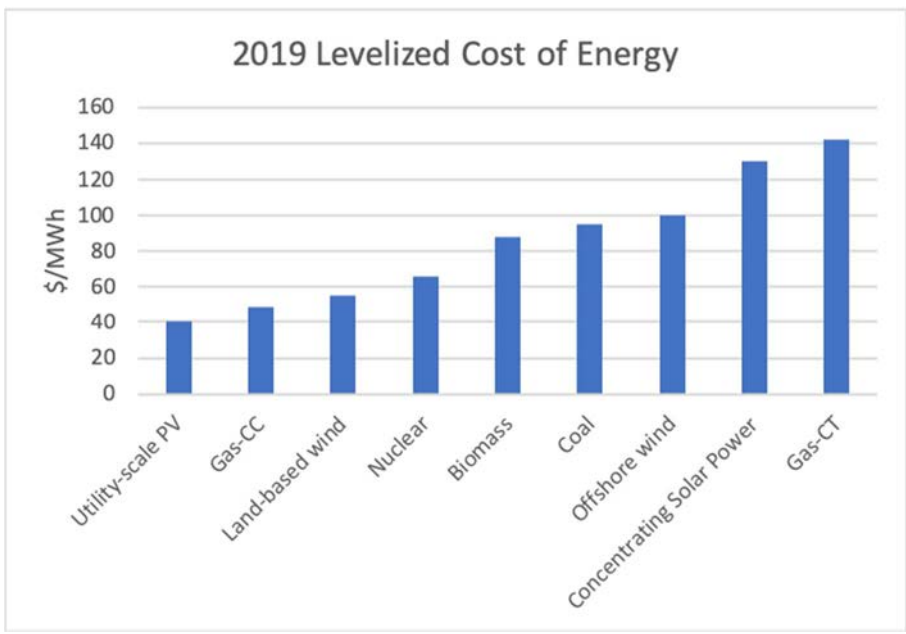
---

<sup>4</sup> See Section 366.03, F.S.

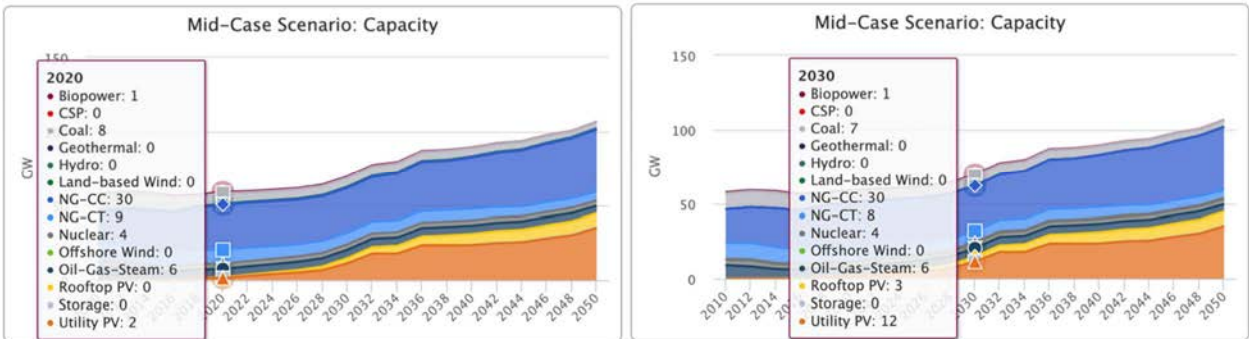
<sup>5</sup> NREL (National Renewable Energy Laboratory). 2019. *2019 Annual Technology Baseline*. Golden, CO: National Renewable Energy Laboratory. Available at <https://atb.nrel.gov/electricity/2019>.

<sup>6</sup> Cole, Wesley, Will Frazier, Paul Donohoo-Vallett, Trieu Mai, and Paritosh Das. 2018. *2018 Standard Scenarios Report: A U.S. Electricity Sector Outlook*, Golden, CO: National Renewable Energy Laboratory. NREL/TP-6A20-71913. Available at <https://www.nrel.gov/docs/fy19osti/71913.pdf>.

<sup>7</sup> <http://newsroom.fpl.com/2019-01-16-FPL-announces-groundbreaking-30-by-30-plan-to-install-more-than-30-million-solar-panels-by-2030-make-Florida-a-world-leader-in-solar-energy>.



1



2

3

4

**Figure 1: Utility-scale PV as least-cost resource today and through the coming decade<sup>8</sup>**

5

**Q. DOES FPL'S SOLARTOGETHER PROGRAM REFLECT THE MOST COST-EFFECTIVE METHOD OF ADDING SOLAR RESOURCES?**

6

7

**A.** It's unclear. The way utility-scale solar projects are added in this proposal could benefit from a more transparent and competitive bid process. All stakeholders have an interest in ensuring that the *most* cost-effective solar resources are being procured for the benefit of customers. It is surprising that FPL didn't consider

8

9

10

<sup>8</sup> *Ibid.*

1 PPA as part of this program because those are frequently the cheapest alternative  
2 in nearby jurisdictions.<sup>9</sup> It is also confusing that FPL doesn't appear to deem  
3 PPAs reliable enough for the purpose of this program,<sup>10</sup> given that its parent  
4 company NextEra competes for and develops solar through PPAs in many  
5 jurisdictions, including Florida.<sup>11, 12</sup>

6 Solar PPAs are sophisticated, long term contracts that include significant penalties  
7 for under-performance. In fact, PPAs often provide more safeguards for a utility's  
8 customers because PPAs insulate them from the risk of cost overruns and the cost  
9 of the utility's return on equity. Utilities across the nation make regular use of  
10 power purchase agreements to procure solar for their customers, which provide  
11 protections to the customers regarding cost overruns and underperformance. In  
12 short, there is no reason why a solar PPA couldn't be appropriate for a community  
13 solar program. Additionally, it's an open and important question whether other  
14 project ownership models like power purchase agreements would have provided  
15 an even greater benefit for FPL customers. Given this possibility, the Commission  
16 should require FPL to consider these market options now for any uncontracted

---

<sup>9</sup> FERC Form 1 shows PPA prices from solar installations in other major southeastern utilities currently compensated at less than \$35/MWh.

<sup>10</sup> See FPL Response to OPC 3rd Int. #10, 11; FPL Response to OPC 6th Int. #29(c); FPL Response to Staff 2nd Int. #173.

<sup>11</sup> NextEra Energy. 2019. February 2019 Investor Presentation. Slide 34.  
[http://www.investor.nexteraenergy.com/~media/Files/N/NEE-IR/news-and-events/events-and-presentations/2019/02012019/February%202019%20Investor%20Presentation%20\\_VFinal2.pdf](http://www.investor.nexteraenergy.com/~media/Files/N/NEE-IR/news-and-events/events-and-presentations/2019/02012019/February%202019%20Investor%20Presentation%20_VFinal2.pdf).

<sup>12</sup> NextEra Energy. 2019. Earnings Conference Call Second Quarter 2019. Slide 25.  
<http://www.investor.nexteraenergy.com/~media/Files/N/NEE-IR/reports-and-fillings/quarterly-earnings/2019/q2/2Q%202019%20Slides%20vF.pdf>.

1 capacity in the current phase as well as in any future phases of SolarTogether that  
2 the Company may propose.

3 **Q. SHOULD THE SOLARTOGETHER PROGRAM BE LARGER?**

4 A. Yes. Given the modeling performed by both the national labs and FPL, in order  
5 to capture all of the cost-effective incremental solar available, it appears that  
6 FPL's total installed capacity of utility-scale solar projects should grow by at least  
7 a factor of five through 2030. FPL's current proposal suggests that this program is  
8 not being sized in order to achieve the goal of capturing all of the available solar  
9 savings, but rather to service the needs of a particular subset of its largest  
10 customers. Notably, the current size of the SolarTogether offering appears  
11 unlikely to meet even the narrow goal of meeting anticipated customer demand;  
12 the current allocation of capacity for large commercial and industrial customers  
13 will be entirely full when the tariff becomes available based on pre-registrations  
14 alone.

15 Further, the FPL filings in this proceeding project savings to the participants with  
16 spillover benefits reserved for the general customer base and a healthy return for  
17 shareholders, so it stands to reason that more solar would provide greater benefits  
18 to all customers and should be investigated. Fundamentally, FPL's analysis fails  
19 to answer the question of *how much more* solar could be brought onto to its  
20 system and result in net benefits. It is likely that expanding the capacity in this  
21 offering would provide larger benefits for all customers; the Commission should  
22 require FPL to evaluate the optimal quantity of solar capacity additions either as  
23 part of the SolarTogether docket or independently to determine what would be

1 best for its customers. FPL does not appear to have done so to date. It is clear that  
2 Florida has a largely uncaptured cost-effective solar resource that will be  
3 available throughout the next decade, some of which should be set aside to benefit  
4 all ratepayers and some of which should be set aside to meet the demands of  
5 specific customers through subscription programs as detailed in the remainder of  
6 my testimony.

7 **IV. WHETHER THE SOLARTOGETHER RATES ARE JUST AND**  
8 **REASONABLE.**

9 **Q. DOES THIS PROGRAM REPRESENT A CHANGE IN POLICY FROM**  
10 **FPL'S PRIOR SOLAR PROGRAMS?**

11 A. Yes. Although FPL states that this program does not represent a policy shift for  
12 the Company,<sup>13</sup> in fact these proposed solar additions are responding to a set of  
13 values expressed by its largest customers, who have clearly stated their preference  
14 to be served by 100% clean energy. This proposal allows a certain subset of FPL  
15 customers to choose their energy supply for the next several decades and to use  
16 the utility's rate-basing authority to achieve those ends.<sup>14</sup> Because of these  
17 distinctions, the Commission should conduct a thorough review of how the risks  
18 and benefits are allocated, including any barriers to participation that leave some  
19 customers without the same choices, freedoms, and opportunities available to  
20 others.

---

<sup>13</sup> FPL Response to Staff 1st Int. #101.

<sup>14</sup> FPL Response to Staff 1st Int. #85 (“FPL is seeking inclusion of all FPL SolarTogether centers in rate base as they benefit all FPL customers...”); *see also* FPL Response to Staff 1st Int. #86.

1 **Q. ARE THE PROPOSED BENEFITS AND RISKS EVENLY SHARED BY**  
2 **THE STAKEHOLDERS?**

3 A. No. If FPL finances the SolarTogether capacity additions in the same proportion  
4 of debt-to-equity as recorded in their FERC Form 1 filings, shareholders could  
5 expect a \$245 million return on this investment over the lifetime of the project,  
6 which exceeds the total benefits to all participants AND non-participants in the  
7 program. Additionally, by using its rate-basing authority, FPL insulates itself and  
8 minimizes or eliminates financial risk to itself and its shareholders. This is a  
9 departure from some other utilities' approach to community solar, which typically  
10 is to ring-fence the program to ensure that all costs are borne by participants and  
11 require the utility to return to the Commission in the event of under-subscription  
12 for an additional prudence review prior to rate-basing.<sup>15</sup>

13 In contrast, FPL's program requires ratepayers to bear the program costs and  
14 risks, which they may recover from participants over time. All other stakeholders'  
15 benefits will only materialize if a series of FPL's assumptions and forecasts turn  
16 out to be correct, including fuel prices, generation and demand forecasts, carbon  
17 regulations, and any deviations from the "No SolarTogether" modeling pathway  
18 that FPL may make in the next several decades.<sup>16</sup>

---

<sup>15</sup> See, e.g., *In Re: Petition for Approval of Cmty. Solar Pilot Program, by Gulf Power Co.*, 328 P.U.R.4th 108 (Mar. 21, 2016) (noting that subscription fees are designed to cover the full revenue requirements of the community solar facilities, and that Gulf Power's shareholders, rather than non-participating customers, are assuming the risk that costs will not be fully supported by the program structure).

<sup>16</sup> See FPL Response to OPC 5th Int. #25 (FPL noting the risks to the general body of customers due to the "uncertainty in the underlying Program assumptions").



1 **Q. DOES FPL'S CURRENT PROGRAM DESIGN STRIKE THE RIGHT**  
2 **BALANCE BETWEEN SHAREHOLDERS, SUBSCRIBERS AND NON-**  
3 **PARTICIPATING CUSTOMERS?**

4 A. No. The highest benefit for all ratepayers based on this research and analysis  
5 would be to rate-base the entire solar allocation - which FPL states that it will do  
6 for much of the program absent program approval - ensuring that all of the  
7 benefits are equally shared by all.<sup>17</sup> That being said, it appears quite likely that  
8 subscribers in the SolarTogether program will see bill relief over the long run  
9 based on current program design (while absorbing the majority of the  
10 performance risk), while the non-participant savings are shown by FPL to be  
11 sensitive to assumptions regarding both fuel prices and carbon regulation and do  
12 not materialize in some of the scenarios evaluated.<sup>18</sup> One thing is certain: in any  
13 long-term energy analysis, the model projections will not come to pass exactly as  
14 projected. The benefits of these solar additions to non-participants appear likely to  
15 be higher than projected by FPL due to conservative assumptions about the  
16 market value of the power when it is provided to the grid, potential CO<sub>2</sub>  
17 regulatory compliance costs, and benefits to the general ratepayers as a result of  
18 participant turnover.

---

<sup>17</sup> In addressing the cost-effectiveness of incremental solar investments, I am not opining on whether FPL's process for seeking approval of 1,490 MW of incremental solar capacity through a tariff filing is appropriate. *See* FPL Response to Staff 1st Int. #139 (FPL notes that the "Commission is evaluating not only the design of the program but also the construction costs... Approval of FPL's petition would result in approval of FPL's construction of that capacity at the projected cost" meaning that no future prudence review would be required).

<sup>18</sup> *See* FPL Response to Staff 1st Int. #110.

1 In summary, FPL’s unique “benefit sharing” proposal, which allocates 80% of the  
2 net benefits to subscribers and 20% to non-participating customers, could offer a  
3 new innovative model of community solar.<sup>19</sup> However, FPL adds to the  
4 uncertainty that this program will benefit non-participants by utilizing a “No  
5 SolarTogether” alternative baseline that ignores all other solar investments that  
6 FPL plans to make over the life of the SolarTogether program - creating a flawed  
7 point of comparison.<sup>20</sup> This baseline removes all planned future incremental solar  
8 investments from FPL’s 2019 Ten Year Site Plan including the 2020 SoBRA  
9 projects that it is currently seeking approval for. Whether through more SoBRA  
10 additions, the 30x30 proposal to install 30 million solar panels by 2030, or some  
11 other mechanism, FPL is very likely to propose increased solar investments in the  
12 near future. In fact, FPL states that it plans to move forward with the initial 900  
13 MW of the SolarTogether program even if this tariff is not approved, and will  
14 develop this capacity for the benefit of all customers.<sup>21</sup> The end result is that FPL

---

<sup>19</sup> See FPL Response to OPC 1st Int. #1; see also FPL Response to OPC 5th Int. #25 (FPL stating that the cost/benefit sharing between participants and non-participants is “a unique attribute not common in other community solar programs”).

<sup>20</sup> See FPL Response to Staff 1st Int. #76 (FPL removed all planned future incremental solar investments from its 2019 TYSP from its baseline prior to analyzing the cost effectiveness of this program); FPL Response to Staff 2nd Int. #191 (FPL stating that “If FPL’s SolarTogether Program is not approved, another resource plan with incremental solar will be more cost-effective to consumers than the No-SolarTogether Plan.”); FPL Response to Staff 1st Int. #102 (FPL’s No-SolarTogether baseline also excludes 2020 SoBRA projects).

<sup>21</sup> FPL states that it plans to move forward with the initial 900 MW of the SolarTogether program even if this tariff is not approved, and will develop this capacity for the benefit of all customers. See FPL Response to Staff 1st Int. #100 (“If the FPL SolarTogether Program is not approved, FPL will continue with the construction of Project 1, Project 2, and Project 3 described in its Petition.”); FPL Response to Staff 1st Int. #133 (Project 1 capacity is 223.5 MW; Project 2 capacity is 223.5 MW; and Project 3 capacity is 447 MW).

1           either intentionally or unintentionally clouds the key issue: not whether more  
2           solar is a net benefit, or that this is a choice between SolarTogether or no solar at  
3           all to serve customers over the next decade, but whether it is in the public interest  
4           to allocate *some* of the solar benefits now to a subset of customers with unique  
5           needs - and if so, how this can be done fairly and equitably.

6   **Q.    IS THERE VALUE IN SETTING ASIDE SOME INCREMENTAL SOLAR**  
7           **CAPACITY FOR CUSTOMERS WITH SPECIFIC CLEAN ENERGY**  
8           **NEEDS?**

9    A.    Absolutely. It appears that FPL is planning significant investments in solar  
10       resources over the next decade, including its 30x30 solar plan – much of which  
11       will serve the entire customer base.<sup>22</sup> At this time, there is immense value in  
12       allowing electric utilities to offer clean energy programs that are available to  
13       customers on a voluntary basis in order to meet the growing demand for clean  
14       energy. The general public and business interests have consistently shown support  
15       for expanding the use of clean energy and a desire to participate in a clean energy  
16       future.<sup>23</sup> One core principle of community solar is that it should expand access to  
17       a broader group of energy consumers than current solar policies and markets

---

<sup>22</sup> See <http://newsroom.fpl.com/2019-01-16-FPL-announces-groundbreaking-30-by-30-plan-to-install-more-than-30-million-solar-panels-by-2030-make-Florida-a-world-leader-in-solar-energy>.

<sup>23</sup> Nearly 200 companies and over 100 municipalities (including 10 in Florida as of this writing) have 100% clean/renewable energy goals, which can be helped through offerings such as SolarTogether. <http://there100.org/companies>; <https://www.sierraclub.org/ready-for-100>.

1 allow.<sup>24</sup> This is consistent with Florida law, which expresses a clear preference for  
2 promoting and encouraging customers’ voluntary clean energy investments.<sup>25</sup>

3 FPL claims that it designed its SolarTogether program to “ensure all customers  
4 have an opportunity to participate.”<sup>26</sup> There are two customer segments that are  
5 particularly unlikely to be served by current solar offerings: those large customers  
6 with robust clean energy goals and significant demand that can’t be met by  
7 rooftop systems alone; and those with financial (*i.e.* low income) or property  
8 barriers (such as households living in multifamily dwellings or renters). These are  
9 the customer segments that the Commission should focus on in evaluating  
10 whether this program is in the public interest, and whether rate-basing a solar  
11 subscription program is appropriate: does FPL’s program offer a *meaningful*  
12 *expansion* in access to clean energy for those customers who need it, as is  
13 encouraged by Florida law?<sup>27</sup>

14 **Q. WILL FPL’S PROGRAM EXPAND CLEAN ENERGY ACCESS?**

15 A. The proposed design of SolarTogether is not responsive to low-income  
16 customers’ needs, and therefore will not lead to their participation. In contrast,  
17 FPL’s program appears fairly well-designed when it comes to meeting the clean  
18 energy needs of large, sophisticated corporate customers. The program has clearly

---

<sup>24</sup> See Vote Solar and GRID Alternatives, *Low-Income Solar Policy Guide*, available at <https://www.lowincomesolar.org/best-practices/community-solar/>.

<sup>25</sup> Sections 366.91 and 366.92, F.S.

<sup>26</sup> FPL Response to Staff 1st Int. #64. See also FPL Response to Staff 1st Int. #65 (FPL’s stated goal to “provide all customer classes a fair and equitable opportunity to participate”).

<sup>27</sup> Sections 366.91 and 366.92, F.S. (encouraging renewable energy investment within the state).

1           been designed to meet the requests and demands of large commercial, industrial,  
2           and governmental customers, many of whom were consulted before the program  
3           was proposed, with an emphasis from FPL on acceptable payback periods and  
4           terms and conditions.<sup>28</sup> SolarTogether is also designed such that the majority of  
5           the capacity is reserved for these largest customers. In fact, the top ten subscribers  
6           who have pre-registered for the SolarTogether program will absorb 752 MW of  
7           the total capacity, or 50.5%, while claiming 40% of its expected net benefits.<sup>29</sup> As  
8           such, the program is likely to work well for many of these large customers.

9           Unfortunately, the same care and approach has not been taken with respect to  
10          residential customers, who are being offered similar terms, as if their needs and  
11          finances were the same as large retailers and municipalities. No similar outreach  
12          effort appears to have been done by FPL to test the program's value proposition  
13          or identify the needs and concerns of its residential customers. Additionally, pre-  
14          registration was only made available for larger customers. The interests of small  
15          business and residential customers don't seem to have been a major concern for  
16          FPL in program design or customer engagement.

17          But this program design creates the most significant concerns when it comes to  
18          the customers who are least able to afford higher rates. Low-income customers  
19          are particularly sensitive to costs, and will be less able to pay a higher electricity  
20          bill for many years. Based on experience from similar programs around the

---

<sup>28</sup> See FPL Response to Staff 2nd Int. #166 (describing FPL's conversations about program design with large corporate customers at events such as the EEI National Key Accounts Workshops).

<sup>29</sup> FPL Response to Staff 1st Int. #123.

1 country, these customers are unlikely to register in any significant number without  
2 immediate bill savings and targeted education and outreach.<sup>30</sup> A first-come, first-  
3 served model that does not explicitly engage this customer segment leaves the  
4 most vulnerable customers of FPL bearing the greatest risk and the least potential  
5 benefits. These poor design decisions must be addressed to improve the  
6 distribution of risk and reward of SolarTogether.

7 **Q. WHAT ADDITIONAL PROTECTIONS WOULD NEED TO BE**  
8 **INCORPORATED FOR THE SPECIFIC NEEDS OF LOW-INCOME**  
9 **CUSTOMERS?**

10 A. High electric bills are a real and significant cost to many FPL customers. Paying a  
11 utility bill is the most common reason people use small-dollar loan products  
12 (payday loans, pawn loans, direct deposit advance loans, auto title loans, non-  
13 bank installment loans, etc.), and the U.S. Energy Information Administration  
14 reports that nearly a third of Americans skip a meal or medicine in order to pay a  
15 utility bill.<sup>31, 32</sup> In a number of communities, it's also been shown that evictions  
16 are highly correlated to the number of households living with a high energy

---

<sup>30</sup> Smart Electric Power Alliance. 2018. "Community Solar Program Design Models," and Interstate Renewable Energy Council. 2016. "Shared Renewable Energy for Low- to Moderate-Income Consumers: Policy Guidelines and Model Provisions".

<sup>31</sup> Levy, Rob, and Joshua Sledge. 2012. A Complex Portrait: An Examination of Small-Dollar Credit Consumers. Center for Financial Services Innovation.

<sup>32</sup> U.S. Energy Information Administration. 2018. Residential Energy Consumption Survey. <https://www.eia.gov/consumption/residential/>.

1           burden.<sup>33</sup> With more than 1.4 million customers in energy poverty (defined as  
2           households paying more than 6% of their income on electricity expenses alone),  
3           FPL cannot afford to ignore this customer segment in any voluntary clean energy  
4           program offerings - and certainly not when proposing the largest program in the  
5           country (*See Exhibit MC-2, showing electricity burdens in FPL’s service*  
6           territory).<sup>34</sup>

7           Low-income customers are especially price-sensitive, and experience with other  
8           community solar programs shows that their participation requires rates that are set  
9           at or below the retail rate.<sup>35</sup> Successful programs require the opportunity for these  
10          customers to save immediately,<sup>36</sup> something which could be available from the  
11          existing stream of benefits FPL evaluated and assigned to the program. These  
12          customers are also likely to require specialized marketing and outreach.<sup>37</sup> A hold-  
13          harmless provision that ensures low-income participants would not experience a  
14          bill increase as a result of joining SolarTogether and a shared-savings model to  
15          reduce energy burdens would be critical program components in ensuring a more  
16          equitable outcome as a result of SolarTogether. It is clear that FPL’s one-size-fits-

---

<sup>33</sup> Brown, M.A., A. Soni, M.V. Lapsa, K.A. Southworth, and M. Cox. (2019). “Low-Income Energy Affordability in an Era of Energy Abundance,” *Progress in Energy*, forthcoming.

<sup>34</sup> Greenlink developed Exhibit MC-2 by analyzing microdata from the American Community Survey (2017) at the census tract level and applying appropriate weights to the data to produce statistically valid results for FPL’s service territory.

<sup>35</sup> Smart Electric Power Alliance. 2018. “Community Solar Program Design Models.”

<sup>36</sup> Interstate Renewable Energy Council. 2016. “Shared Renewable Energy for Low- to Moderate-Income Consumers: Policy Guidelines and Model Provisions.”

<sup>37</sup> *Ibid.*

1 all approach to community solar will not result in a successful program for these  
2 customers.

3 **Q. WHAT ARE YOUR RECOMMENDATIONS FOR BETTER SERVING**  
4 **LOW INCOME CUSTOMERS WITH THIS PROGRAM?**

5 A. Well-designed community solar programs share certain themes: expanding access  
6 to a broader group of consumers than current policies and markets have allowed;  
7 compensating participants for the long-term value of the clean energy produced;  
8 allowing for flexibility in ownership and contract models to meet the preferences  
9 of potential participants and overcome their most frequent barriers; and  
10 representing additive clean energy capacity, rather than undermining existing  
11 efforts already underway. At least 11 states have taken steps to recognize the  
12 importance and challenges of serving low-income customers with community  
13 solar, and best-practices are available and should be put to use.<sup>38</sup>

14 Given the extensive shareholder benefits that are being provided with minimal  
15 risk, there is a need to align the incentives of SolarTogether with the interests of  
16 their customers. With the disproportionate risk placed on low-income customers  
17 under the current program design, a block of capacity reserved for low-income  
18 customers with specific consumer protections would vastly improve this offering.

19 Given the severe energy poverty experienced by many customers of FPL, I  
20 recommend reserving a meaningful amount of program capacity for low-income

---

<sup>38</sup> See Vote Solar and GRID Alternatives, *Low-Income Solar Policy Guide*, available at <https://www.lowincomesolar.org/best-practices/community-solar/>.



1 customers to experience the financial benefits that will come from the addition of  
2 new solar as a part of the SolarTogether program. The Commission should require  
3 FPL to either set aside or expand its program by 100 MW of SolarTogether  
4 capacity to provide an opportunity for at least 20,000 of FPL's low-income  
5 customers to participate. These low-income customers will require some  
6 provision of benefits early in order to enable their participation and cannot wait  
7 years for benefits to materialize, which the current program design would require.  
8 The Commission should require FPL to provide meaningful bill relief that will  
9 reduce low income subscribers' annual electric bills by 10% or more.

10 There are a number of options to achieve this level of savings. One option to bring  
11 community solar savings and bill relief to low-income customers is to allow these  
12 subscribers to use their generation credits to offset their consumption on a one-  
13 for-one basis during the first several years of the program. This would provide the  
14 most comparable equivalent to FPL's net metering policy for these low-income  
15 subscribers. Other utilities in the Southeast provide this option for community  
16 solar participants even without income qualifications.<sup>39</sup> To date, low income  
17 consumers have been under-represented in rooftop solar adoption, meaning that  
18 many of these households have been unable to participate in the state's net  
19 metering policy.<sup>40</sup> This would provide these customers who have been unable to

---

<sup>39</sup> See, e.g., Georgia Power's Community Solar program, available at <https://www.georgiapower.com/company/energy-industry/energy-sources/solar-energy/solar/community-solar.html>.

<sup>40</sup> Galen Barbose, Naïm Darghouth, Ben Hoen, and Ryan Wiser of Lawrence Berkeley National Lab. 2018. *Income Trends of Residential PV Adopters: An analysis of household-level income estimates*, available at

1 participate in net metering offerings to date with a real option for accessing this  
2 policy for the first time.<sup>41</sup> With this offering, FPL could maintain its proposed  
3 subscription charge and address energy poverty by reducing electricity bills of  
4 low income participants by 10% or more.

5 An alternative option would be to provide low-income customers with demand-  
6 side savings through energy efficiency simultaneously with the SolarTogether  
7 subscription. FPL could couple participation in SolarTogether with delivery of  
8 demand-side management offerings that will leverage additional savings to  
9 achieve a 10% bill reduction. Research from the National Laboratories has  
10 demonstrated a cost-effective opportunity for energy efficiency to offset more  
11 than 30% of the average Florida household's electricity consumption with a  
12 payback of under five years through smart thermostats, insulation, lighting and  
13 appliance upgrades.<sup>42</sup> Other utilities have deployed this approach of coupling  
14 community solar with efficiency offerings successfully for their low-income  
15 customers.<sup>43</sup>

---

[http://eta-  
publications.lbl.gov/sites/default/files/income\\_trends\\_of\\_residential\\_pv\\_adopters\\_final\\_0.pdf](http://eta-publications.lbl.gov/sites/default/files/income_trends_of_residential_pv_adopters_final_0.pdf).

<sup>41</sup> See Fla. Admin. Code Ann. r. 25-6.065 (Florida's net metering regulation).

<sup>42</sup> Wilson, Eric J., Christensen, Craig B., Horowitz, Scott G., Robertson, Joseph J., & Maguire, Jeffrey B. *Energy Efficiency Potential in the U.S. Single-Family Housing Stock*. United States. doi:10.2172/1414819.

<sup>43</sup> Dominion Energy South Carolina's community solar program includes a carve-out for low income customers, which offers year-1 savings to these participants and also requires customers to complete a free Home Energy Check-Up offered by their utility prior to being eligible to enroll, providing access to the utility's other efficiency programs. See Community Solar Rider, <https://www.sceg.com/docs/librariesprovider5/electric-gas-rates/community-solar-rider-to-retail-rates.pdf?sfvrsn=2>; ORS Status Report,

1 In all circumstances, a hold-harmless provision should be incorporated to  
2 empower low-income customers to participate in SolarTogether without fear that  
3 they may further stress their finances by desiring to participate in producing a  
4 better future for their communities.

5 Finally, the Commission should consider and explore a performance-based  
6 incentive for low-income participation in future phases of the SolarTogether  
7 program. Doing so would help ensure that the interests of these customers are  
8 thoughtfully incorporated into the design of the program and benefit all  
9 stakeholders at the same time.

10 **Q. WOULDN'T A CARVE-OUT FOR LOW INCOME CUSTOMERS GIVE**  
11 **PREFERENCE TO THEM?**

12 A. Yes, appropriately so. This preference is neither undue nor unreasonable. The  
13 Commission is charged with considering the cost of providing service, as well as  
14 the rate history, value of service, and experience of the public utility.<sup>44</sup> It is the  
15 role of this Commission to consider the unique barriers and burdens that are borne  
16 by FPL's low-income customers in fixing rates for this program. Rather, failure to  
17 specifically consider whether low income and residential customers will be able  
18 to benefit from this offering would not serve the public interest.

---

<https://ors.sc.gov/sites/default/files/Documents/Consumers/Solar/Leading%20Information/2019%20Report%20on%20Status%20of%20DER%20and%20NEM.pdf>.

<sup>44</sup> See Sections 366.06, F.S.

1 **Q. WHAT ARE YOUR RECOMMENDATIONS WITH RESPECT TO**  
2 **RESIDENTIAL AND SMALL COMMERCIAL SUBSCRIBERS?**

3 A. To ensure fair consideration of these customers' unique needs, I recommend that  
4 the Commission require a fixed capacity be set aside for residential and small  
5 commercial customers (rather than allowing FPL to reduce or eliminate this  
6 capacity based on initial response), in addition to requiring a specific carve-out  
7 for low-income customers.<sup>45</sup> FPL should be required to submit annual reports to  
8 the Commission on its progress in enrolling these customers in the program, and  
9 the Commission should order FPL to engage in a robust stakeholder process to  
10 improve program offerings and outreach efforts if the capacity remains unfilled  
11 after several years.

12 **Q. DOES SOLARTOGETHER REPRESENT AN ATTRACTIVE**  
13 **EQUIVALENT OPTION TO NET METERING FOR RESIDENTIAL**  
14 **CUSTOMERS?**

15 A. No, it does not. Although FPL frequently notes in its testimony and discovery  
16 responses that it proposes this program as an "alternative" to net metering,<sup>46</sup> this  
17 comparison is misleading and misinformed at best, and concerning, because the  
18 value propositions for FPL's customers are so much better under net metering.

---

<sup>45</sup> See FPL Response to Staff 1st Int. #65 (FPL stating that it is seeking authority to reallocate up to 100% of the program capacity to one customer class in the future without seeking additional approval from the Commission).

<sup>46</sup> Valle, Matthew. *Florida Power and Light Company, Direct Testimony of Matthew Valle*, Docket No. 20190061-El. July 29, 2019. Before the Florida Public Service Commission.

1 SolarTogether offers customers an opportunity to offset their electricity  
2 consumption by leasing capacity in utility-scale solar systems and receiving a  
3 payment for generation that is typically appropriate for utility-scale generators  
4 with net benefits not occurring until 9 years in the future. Net metering, on the  
5 other hand, allows those who install solar on their own premises to receive steady  
6 compensation at the retail rate of electricity so long as there is not a net surplus at  
7 year's end. As a result, the net metering customer typically owns the solar assets  
8 and, in most instances today, makes less use of the transmission and distribution  
9 system. This provides value to the customer and to the grid by reducing system  
10 utilization, improving home values, reducing emissions, adding resiliency to the  
11 grid, and creating other values that the system owner may assign to the  
12 installation. Many of those values are quantifiable, but not all.

13 **Q. PLEASE COMPARE THE FINANCIAL VALUE PROPOSITION OF**  
14 **SOLARTOGETHER AND ROOFTOP SOLAR.**

15 A. Comparing the financial value proposition of each option shows that the net  
16 present value of customer owned rooftop solar to the average participating  
17 residential customer approaches \$7,000 over a thirty-year window with a simple  
18 payback period of 9 years with the use of existing incentives. SolarTogether  
19 would provide the same customer a net present value benefit of \$420 dollars, also  
20 with a 9-year simple payback period. The financial value proposition of net  
21 metering is roughly 15 times stronger than that of SolarTogether. Residential  
22 customers unable to pursue net metering may find SolarTogether represents an

1 avenue to move to clean energy for their energy supply, but the proposed program  
2 is by no means an equivalent replacement for net metering.

3 **Q: WHAT ARE YOUR RECOMMENDATIONS TO THE COMMISSION**  
4 **CONCERNING FPL’S MARKETING OF THIS PROGRAM?**

5 A. It is concerning that FPL plans to present SolarTogether as a comparable  
6 alternative to investing in rooftop solar in its marketing materials.<sup>47</sup> Another core  
7 principle of community solar is that it should be additive to existing renewable  
8 energy programs, and not undermine them.<sup>48</sup> FPL is clear that in designing the  
9 rate structure for this program, a primary motivator was to achieve a seven year  
10 payback period for subscribing customers.<sup>49</sup> When a monopoly utility is permitted  
11 to use its rate-basing authority to impact the economics of a clean energy offering  
12 in order to reach a certain value proposition for certain subscribing customers (in  
13 this case, seven years), it raises a concern of whether FPL’s real intent is to  
14 *undermine* current market options from rooftop solar companies, rather than being  
15 motivated to *expand* the suite of clean energy offerings for its customers. If FPL  
16 is indeed seeking to expand upon rather than compete with rooftop solar

---

<sup>47</sup> See FPL Response to Staff 1st Int. #51 (FPL’s web-based enrollment system for SolarTogether will provide a payback calculation for residential and small commercial customers comparing a net metered rooftop solar system to a SolarTogether subscription).

<sup>48</sup> See Vote Solar and GRID Alternatives, *Low-Income Solar Policy Guide*, available at <https://www.lowincomesolar.org/best-practices/community-solar/>.

<sup>49</sup> See FPL Response to Staff 1st Int. #117 (“In order for participants to achieve a 7-year payback, approximately 94.9% of the system benefits ... were allocated to participants.”); see also FPL Response to OPC 5th Int. #25; FPL Response to Staff 2nd Int. #170 (FPL sought to offer participants “a simple payback that met the market needs...”).

1 offerings, the Commission should not allow FPL to market subscriptions in  
2 SolarTogether as a comparable alternative to rooftop solar.

3 **Q. DOES FPL'S SOLARTOGETHER PROGRAM RECOGNIZE VALUE TO**  
4 **THE GRID IN INNOVATIVE WAYS?**

5 A. No. The program could incorporate a time-varying rate that would better reflect  
6 the value of solar to the grid and all of its users instead of using flat, average  
7 avoided cost evaluations of generically-provided energy to the grid. These values  
8 could be projected and calculated or could be determined in real time, and there  
9 are examples nationally of both approaches being proposed and utilized.<sup>50</sup> The  
10 value of ancillary services from the generation is also not directly captured by the  
11 current proposal, another area where real value to the grid is accruing to FPL and  
12 non-participants but not to the customers paying to provide those benefits.  
13 Participation in the program could also be contingent on enrollment in time-of-use  
14 rates and could come with assistance from FPL like demand-side management  
15 activities that would incentivize participants to provide greater benefits for all  
16 stakeholders on the grid. Incorporating these opportunities would allow  
17 SolarTogether to be notable for more than its sheer size. I recommend that the  
18 Commission require FPL to consider such improvements in any future phases of  
19 the program offering.

---

<sup>50</sup> Barua, Priya and Celina Bonugli. 2018. *Emerging Green Tariffs in US Regulated Electricity Markets*. World Resources Institute. [https://wriorg.s3.amazonaws.com/s3fs-public/emerging-green-tariffs-in-us-regulated-electricity-markets\\_1.pdf](https://wriorg.s3.amazonaws.com/s3fs-public/emerging-green-tariffs-in-us-regulated-electricity-markets_1.pdf).

1 If these recommendations are adopted, SolarTogether can provide over a thousand  
2 megawatts of cost-effective new solar capacity, meet the needs and demands of  
3 largest customers, improve energy equity for the entire FPL customer base and  
4 provide an innovative model for other utilities to follow.

5 **Q. DO YOU HAVE ANY OTHER RECOMMENDATIONS?**

6 A. Yes. In order to further improve the value proposition of this program for all  
7 participants, I recommend that the Commission require FPL to retire all the RECs  
8 on subscribers' behalf. FPL's current proposal is to retire Renewable Energy  
9 Credits (RECs) when subscribers ask for it.<sup>51</sup> FPL explains that "some customers  
10 want to contribute to the growth of solar but do not have need for the RECs."<sup>52</sup>  
11 All customers need assurance that their investments in the program are actually  
12 contributing to the growth of solar. The best way to ensure that is to foreclose the  
13 option for FPL or some other party to utilize the RECs associated with a  
14 customer's subscription for some future purpose - raising the risk of double-  
15 counting and undermining the integrity of FPL's offering.

16 **Q. DOES THIS CONCLUDE YOUR PRE-FILED TESTIMONY?**

17 A. Yes, it does.

---

<sup>51</sup> See FPL Response to Staff 1st Int. #69 (FPL plans to retire RECs only if customers opt in).

<sup>52</sup> FPL Response to Staff 2nd Int. #171.



**Matt Cox, PhD**  
[mcox@thegreenlinkgroup.com](mailto:mcox@thegreenlinkgroup.com)  
[www.thegreenlinkgroup.com](http://www.thegreenlinkgroup.com)



---

### SUMMARY

Co-founder and Chief Executive Officer of The Greenlink Group Inc., an analysis and consulting firm, built upon its award-winning modeling tools, Greenlink provides the evidence and expert analysis needed to evaluate the most pressing issues of policy, environmental economics, and climate change.

Matt is an energy and climate policy expert with Master's and Doctoral degrees in public policy. Matt is the primary designer of several energy policy and technology software models. Author of over sixty scientific articles on energy efficiency and renewable energy, his research has informed energy efficiency policy adoption and design at the local, state, national, and international levels, with policy recommendations adopted by several cities and states, the U.S. government, and 12 other nations. Matt has also been the primary architect and implementer of energy efficiency policies.

Areas of Expertise include:

Energy Policy  
Energy efficiency  
Renewable energy  
Economic development  
Sustainability

### EDUCATION

<b>Georgia Institute of Technology</b> , <i>Ph.D. in Public Policy, Energy and Environment</i> , Atlanta, GA	<b>2014</b>
<i>Minor in Sustainable Development; Dissertation on the effectiveness of climate and energy policies in US metropolitan areas</i>	
<b>Georgia Institute of Technology</b> , <i>M.S. Public Policy, Energy and Environment</i> , Atlanta, GA,	<b>2009</b>
<i>Minor in Economic Development</i>	
<b>University of Dayton</b> , <i>B.S. Environmental Biology</i> , Dayton, OH,	<b>2008</b>
<i>Minor in Philosophy</i>	

---

### PRESENT ACTIVITIES

Creator of energy and water systems modeling software designed specifically to inform policy discussions of energy resources  
Lead consultant on transitioning cities towards achieving clean energy targets  
Project leader on energy policy analysis in cities and states across the United States  
Consultant on energy efficiency opportunities for government and industrial facilities  
Consultant on energy efficiency and renewable energy policy options at the state and local level  
Expert witness to state legislatures and utility commissions on energy policy  
Member of several policy and standard working groups, including the NIST Smart Cities Energy SuperCluster (policy leadership team), ASHRAE 211 Standard for Commercial Building Energy Audits, the National Building Labeling Working Group, the National Water Audits and Assessments Group, and the Livable Buckhead Sustainability Committee.

---

### **RELATED PAST EXPERIENCE**

#### **City of Atlanta**

**08/2014 – 09/2015**

*Buildings Energy Efficiency Project Manager/Senior Advisor, City Energy Project*

Researched, drafted, led stakeholder engagement, and crafted the implementation plan for the City of Atlanta's commercial energy efficiency policy, which positioned Atlanta as the 5<sup>th</sup> city nationally with a comprehensive energy program and the 1<sup>st</sup> with comprehensive water efficiency policy.

Chaired the City Advisor's Network of the City Energy Project, disseminating research results, best implementation practices, and providing a forum for idea sharing.

Assisted in crafting the energy services performance contract for the City of Atlanta, to benchmark, audit, and retrocommission 200 municipal buildings.

Assessed, modeled, and supported the development of a \$500 million clean energy financing program.

#### **Georgia Institute of Technology**

**05/2009 – 08/2014**

*National Science Foundation IGERT Fellow/Researcher*

Researched engineering and policy opportunities for innovative energy technologies and developed an engineering and economics model to forecast sustainable energy pathways for the State of Georgia.

Founding member of the Climate and Energy Policy Laboratory at the Georgia Institute of Technology.

Developed policy options to address non-technical barriers to commercial- and industrial-sector energy efficiency for the U.S. Department of Energy Climate Change Policy and Technology program with Oak Ridge National Laboratory.

---

### **RESEARCH AND PUBLICATIONS\***

*\*The majority of analyses and consulting work conducted by The Greenlink Group is done under a non-disclosure agreement and therefore is not public.*

- Brown, MA, A Soni, MV Lapsa, KA Southworth, M Cox. (2019). "Low-Income Energy Affordability in an Era of Energy Abundance," *Progress in Energy*, Vol 1. <https://dx.doi.org/10.1088/2516-1083/ab250b>
- Cox, Matt. 2018. "How Information Can Drive Efficiency in Large Buildings: A Case Study of Impacts for Reno. (2019 updated for new legislative action)" Prepared for the City of Reno City Manager's Office.
- The Institute for Market Transformation. 2019. "Water Audit Guidance for Commercial Buildings." (credited as a guide developer).
- Robinson, Marriele, and Seth Mullendore. 2019. "Resilient Southeast: Exploring Opportunities for Solar+Storage in Five Cities". (Technical and analytical support provided by Matt Cox and Xiaojing Sun).
- Cox, William Matthew, and Karl R. Rabago. *Testimony of Dr. William M. Cox, PhD and Karl Rabago, Presented as Panel on behalf of the Georgia Solar Energy Association, Inc, and the Georgia Solar Energy Industries Association, Inc.* April 25, 2019. *Before the Georgia Public Service Commission.*
- Cox, William Matthew. *Direct Testimony of William M. Cox, PhD on Behalf of Georgia Interfaith Power and Light, Partnership for Southern Equity, Southface Energy Institute, and Vote Solar.* Dockets 42310 and 42311. April 25, 2019. *Before the Georgia Public Service Commission.*

- Cox, Matt and Samantha McDonald. June 2019. "Miami-Dade Energy and Water Efficiency Policy Opportunities." Prepared for Miami-Dade County.
- Cox, Matt. 2019. "A review of issues regarding the 2019 TVA IRP." Prepared for the Southern Environmental Law Center.
- Cox, Matt. 2019. "San Antonio Clean Energy/Climate Action Economic Development Impact Study." Prepared for the Natural Resources Defense Council.
- Cox, Matt and Samantha McDonald. 2018. "Identifying Commercial Energy Efficiency Opportunities: A Data-Driven Approach for New Orleans." Prepared for the City of New Orleans.
- Cox, William Matthew. 2018. *Direct Testimony of William Matthew Cox, PhD, on Behalf of Environmental Respondents*. Case No. PUR-2017-00157. June 19, 2018. *Before the Virginia State Corporation Commission*.
- Cox, et al. 2018. "Leveraging Energy Efficiency in Atlanta's 100% Clean Energy Plan." 2018 ACEEE Summer Study on Energy Efficiency in Buildings.
- City of Atlanta. "Clean Energy Atlanta: A Vision for a 100% Clean Energy Future." 2018. *Key contributing author*
- Nagpal, Shreshth, Hong, Tianzhen, Cox, Matt, and New, Joshua R. (Seminar Chair) (2018). "Seminar 16 - Urban-Scale Energy Modeling, Part 8." In Proceedings of the ASHRAE Conference, Houston, TX, June 23, 2018.
- Cox, Matt and Samantha McDonald. 2018. "Data Driven Efficiency Policy: A Case Study of Des Moines." Prepared for the City of Des Moines, Iowa.
- Rudd, et al. 2018. "Climate Research Priorities for policymakers, practitioners, and scientists in Georgia, USA." *Environmental Management*. <https://doi.org/10.1007/s00267-018-1051-4>
- Cox, Matt. 2018. "How Information Can Drive Efficiency in Large Buildings: A Case Study of Impacts for Reno." Prepared for the City of Reno City Manager's Office.
- Cox, William Matthew. 2017. *Direct Testimony of William Matthew Cox, PhD, on Behalf of Georgia Interfaith Power and Light and the Partnership for Southern Equity*. Docket 29849. December 1, 2017. *Before the Georgia Public Service Commission*.
- Sun, Xiaojing, and Matt Cox. 2017. "A Pathway to a Cleaner Energy Future in North Carolina." Prepared for the Sierra Club, North Carolina Chapter.
- Cox, Matt and Caroline Golin. 2017. "The Economic Opportunities of Electric Vehicles in Georgia." Prepared for Plug In America and the Southern Alliance for Clean Energy.
- Cox, Matt and Xiaojing Sun. 2017. "Decision Points: Is New Nuclear Needed?" Prepared for the Southern Environmental Law Center, Georgia Office and VoteSolar.
- Cox, Matt. 2017. "Clean Energy Has Arrived: Tapping Regional Resources to Avoid Locking In Higher Cost Natural Gas." Prepared for the Southern Environmental Law Center, North Carolina Office. Filed as comment with the Federal Energy Regulatory Commission.
- Sun, Xiaojing, Caroline Golin, and Matt Cox. 2017. "North Carolina's Electricity Future." Prepared for the Sierra Club, North Carolina Chapter.
- Cox, Matt and Xiaojing Sun. 2017. "Advancing a Clean Energy Economy in North Carolina." Prepared for the Southern Environmental Law Center, North Carolina Office.
- Cox, Matt. 2017. "Cutting Emissions from Office Buildings with LEED." Prepared for the US Green Buildings Council.
- Cox, Matt, Xiaojing Sun, John Seryak, and Jordan Nader. 2016. "Grounds for Optimism: Options for Empowering Ohio's Energy Market". Prepared for The Nature Conservancy and The Environmental Defense Fund.
- Golin, Caroline, Xiaojing Sun, and Matt Cox. 2016. "The Potential for Demand-Side Resources in the District of Columbia." Prepared for the Department of Energy and Environment.
- Cox, Matt, Caroline Golin, Xiaojing Sun, Shan Arora, Ruthie Norton, and Megan O'Neil. 2016. "Working to Pick Up the PACE". Regional Studies Association 2<sup>nd</sup> North America Conference.
- Golin, Caroline, Matt Cox, and Xiaojing Sun. 2016. "Joining the Revolution: City Networks as Change Agents". Regional Studies Association 2<sup>nd</sup> North America Conference.
- Sun, Xiaojing, Caroline Golin, and Matt Cox. 2016. "Water in the Wires: Electricity, Water, and the Value of Distributed Resources in Atlanta". Regional Studies Association 2<sup>nd</sup> North America Conference.

- Matt Cox. 2016. *Direct Testimony of William M. Cox, PhD, on Behalf of Georgia Interfaith Power and Light and the Southface Energy Institute*. Docket Nos 40161, 40162. May 3, 2016. *Before the Georgia Public Service Commission*.
- Brown, Marilyn A., Matt Cox, Ben Staver, Paul Baer. 2016. "Modeling climate-driven changes in US buildings energy demand". *Climatic Change* 134, 29-44.
- Golin, Caroline, Matt Cox, Marilyn A. Brown, and Valerie Thomas. "The Water Efficiency Gap". 2016. *Sustainable Water Resources Management* 1, Issue 4, 315-324.
- Brown, Marilyn and Matt Cox. 2015. "PROGRESS IN ENERGY AND CARBON MANAGEMENT IN LARGE U.S. METROPOLITAN AREAS". *Energy Procedia* 75, 2957–2962.
- Cox, Matt and Caroline Golin. 2016. *Analyzing Orlando's Building Energy Benchmarking & Reporting Draft Proposed Ordinance*. Prepared for the Institute of Market Transformation.
- Cox, Matt and Caroline Golin. 2015. *Analyzing Kansas City's Building Energy Benchmarking & Reporting Draft Proposed Ordinance*. Prepared for the Institute for Market Transformation.
- Sun, Xiaojing, Marilyn A. Brown, Matt Cox, and Roderick Jackson. 2015. *Mandating Better Buildings: A Global Review of Building Codes and Prospects for Improvement in the United States*, Wiley Interdisciplinary Reviews (WIREs): Energy and Environment.
- Golin, Caroline and Matt Cox. 2015. *Determining the Value of Solar in Georgia*. Prepared for the Southern Environmental Law Center.
- Cox, Matt and Caroline Golin. 2015. *Analyzing Atlanta's Building Energy Benchmarking and Reporting Draft Proposed Ordinance*. Prepared for the City of Atlanta Mayor's Office of Sustainability.
- Matt Cox and Caroline Golin. 2014. *The Impacts of Net Metering in South Carolina*. Presented as supporting evidence for Direct Testimony in Docket 2014-246-E-December 10, 2014
- Golin, Caroline and Matt Cox. 2014. "ForeSEE: Resilience, sustainability and improved social outcomes." The Clean Energy Education and Empowerment Awards.
- Brown, Marilyn, and Matt Cox. 2014. "Pathways to Urban Sustainability: Energy and Climate Drivers." Presentation given at the 2014 American Planning Association National Planning Conference.
- Cox, Matt and Marilyn Brown. 2014. "Sustaining the City: Trends in Energy and Carbon Management in Large US Metros." 2014 ACEEE Summer Study on Energy Efficiency in Buildings.
- Sun, Xiaojing, Matt Cox, and Marilyn Brown. 2014. "Energy Benchmarking of Commercial Buildings: A Low-Cost Pathway toward Urban Sustainability." 2014 ACEEE Summer Study on Energy Efficiency in Buildings.
- Brown, Marilyn, Paul Baer, Matt Cox, Yu Wang, Xiaojing Sun, and Alex Smith. 2014. "Climate Change and Energy Demand in Buildings." 2014 ACEEE Summer Study on Energy Efficiency in Buildings.
- Cox, Matt. 2014. "Sustaining the City: Understanding the Role of Energy and Carbon Dioxide Emissions in Sustainable Development in Major Metropolitan Areas." Doctoral Dissertation, Georgia Institute of Technology.
- Cox, Matt, and Marilyn Brown. 2014. "Too Rich To Care? Following Carbon Emissions in 100 US Metropolitan Areas." 2014 Georgia Tech Research and Innovation Conference.
- Brown, Marilyn, Paul Baer, Matt Cox, and Yeong-Jae Kim. 2014. "Incorporating Risk in an Evaluation of Energy Policy Options." *Energy Efficiency* 7, 1-22.
- Cox, Matt, Rachel Muhlbauer, and Adam Vitale. 2013. "The Sun Will Come Out Tomorrow, But Will It Matter? A Technological Review and Policy Analysis of Solar Power and Net Metering in Georgia." 2013 Southeast Regional Energy Symposium.
- Cox, Matt, Marilyn Brown, and Xiaojing Sun. 2013. "Energy Benchmarking of Commercial Buildings: A Low-Cost Pathway for Urban Sustainability." *Environmental Research Letters* 8, 1-12.
- Cox, Matt. 2013. "Better Outcomes through Better Public Procedures? Studying the Pursuit of the Public Interest in Urban Environmental Sustainability Policy." *Proceedings of the 9<sup>th</sup> Transatlantic Dialogue*.
- Sun, Xiaojing, Matt Cox, and Marilyn Brown. 2013. "We Can (Re)Build It Better: Designing and Evaluating A National Aggressive Commercial Building Energy Code." 2013 Georgia Tech Research and Innovation Conference.
- Brown, Marilyn, Matt Cox, and Paul Baer. 2013. "Reviving Manufacturing with a Federal Cogeneration Policy." *Energy Policy* 52, January. P 264-276.

- Cox, Matt. 2012. "SUSTAINING THE CITY: A COMPREHENSIVE ANALYSIS OF THE CO<sub>2</sub> EMISSIONS AND ENERGY CONSUMPTION OF NEW YORK CITY AND ATLANTA". 2012 World Energy Engineering Conference.
- Cox, Matt, Marilyn Brown, and Xiaojing Sun. 2012. "The Distributive Impact of Carbon Pricing on Commercial Buildings." 2012 ACEEE Summer Study on Energy Efficiency in Buildings.
- Cox, Matt. 2012. "Filling Policy Gaps for Deploying Organic PV." From Transit Hubs to Combat Zones: Serving the Government Customer with Lightweight Materials.
- Cox, Matt. 2011. "Sustainable Transitions: Adaptive Management Approaches to Energy and Climate Change in the United States." NSF Climate Ethics Works-In-Progress Conference.
- Cox, Matt, Marilyn Brown, and Roderick Jackson. 2011. "Regulatory Reform to Promote Clean Energy: The Potential of Output-Based Emissions Standards." 2011 ACEEE Summer Study on Energy Efficiency in Industry.
- Jackson, Roderick, Marilyn Brown, and Matt Cox. 2011. "Policy Analysis of Incentives to Encourage Adoption of the Superior Energy Performance Program." 2011 ACEEE Summer Study on Energy Efficiency in Industry.
- Brown, Marilyn, Matt Cox, and Roderick Jackson. 2011. "Expanding the Pool of Federal Policy Options to Promote Industrial Energy Efficiency." 2011 ACEEE Summer Study on Energy Efficiency in Industry.
- Brown, Marilyn A, et al. 2011. "Making Industry Part of the Climate Solution: Policy Options to Promote Energy Efficiency." Available at: [info.ornl.gov/sites/publications/Files/Pub23821.pdf](http://info.ornl.gov/sites/publications/Files/Pub23821.pdf)
- Brown, Marilyn A, Matt Cox, and Rodrigo Cortes. 2011. "Reinventing Industrial Energy Use in a Resource Constrained World." Chapter 12 in *Energy, Sustainability, and the Environment: Technology, Incentives, Behavior*, Fereidoon Sioshansi, ed.
- Brown, Marilyn A, Matt Cox, and Rodrigo Cortes. 2010. "Transforming Industrial Energy Efficiency," *The Bridge* (Washington, DC: National Academy of Engineering), Fall, pp. 22-30. Available at <http://www.nae.edu/File.aspx?id=24518>
- Brown, Marilyn, et al. "Appendix G: State Profiles." *Energy Efficiency in the South*. Southeast Energy Efficiency Alliance, 12 Apr. 2010. Available at <http://www.seealliance.org/programs/se-efficiency-study.php>
- Raison, Bryan, and Matt Cox. 2009. "Buying Local Foods and other products!" *The Power of Your Change: How Your Everyday Purchases Change the World*. 3rd Annual Global Solidarity Conference. University of Dayton.
- Raison, Bryan, and Matt Cox. 2008. "Local Foods: Idea Sharing for Community and Economical Development Practice Roundtable." *Galaxy III Conference for Extension Professionals*. Indianapolis, Indiana.
- Cox, Matt. 2008. "Rain Gardens: Use and Application on Campus and in Dayton." *Stander Symposium*, University of Dayton.
- Cox, Matt. 2008. "Sustainable Renovation of Facilities and Grounds at UD: Greening the Campus by Blending Academics with Nature and Lifestyle." *Stander Symposium*, University of Dayton.
- Cox, Matt. 2008. "Composting at the University of Dayton: A Feasibility Study." *Stander Symposium*, University of Dayton.
- Cox, Matt, et al. 2007. "Dorothy Stang Memorial Sustainable Building Design." *Stander Symposium*, University of Dayton.
- Cox, Matt. 2007. "Addressing Human and Environmental Health through Cleaning Chemicals." *Beta Beta Beta Undergraduate Research Forum*, University of Dayton.

#### **RELEVANT INVITED LECTURES AND TALKS**

- Invited speaker, *City Commitments to Clean Energy*, Florida League of Cities Annual Meeting, August 16, 2019, Orlando, Florida
- Invited speaker, *Sustainable Urban Infrastructure*, National Science Foundation, August 15, 2019, Atlanta, Georgia
- Invited speaker, *Clean Cities Renewable Power Procurement*, July 25-25, 2019, Denver, Colorado
- Invited speaker, *Careers in Sustainability*, June 27, 2019, Georgia Institute of Technology

- Invited lecture, *Energy Equity and Clean Energy Analysis in the US South*, June 15, 2019, for the Partnership for Southern Equity
- Invited speaker, *Orlando: Renewable and Resilient*, June 6, 2019, for the Solar Energy Innovation Network, hosted by the National Renewable Energy Laboratory
- Invited speaker, *Energy Equity Mapping*, June 3, 2019, for the Urban Sustainability Directors Network and the Institute for Market Transformation
- Invited speaker, *The Economic Case for Resilient Solar+Storage in the Southeast*, May 16, 2019, with the Clean Energy Group
- Invited speaker, *Introduction to Climate Change and Greenhouse Impact Modeling*, for the American Cities Climate Challenge
- Invited speaker, *Third Convening*, for the American Cities Climate Challenge
- Invited speaker, Rate-making “Shark Tank”/Georgia Ratemaking Workshop #6, Southface Energy Institute
- Invited speaker, Choose your Climate Adventure, 2019 Atlanta Science Festival
- Invited lecture, Addressing Climate Change in Atlanta, PACE Academy, 2019
- Invited speaker, Assessing Utility Planning with ATHENIA, Southeast Energy Efficiency Alliance, 2018
- Invited speaker, *Second Convening*, for the American Cities Climate Challenge
- Invited lecture, Designing Future Policy Pathways. Institute for Georgia Environmental Leadership, November 2018
- Invited speaker, Clean Energy Impacts that Matter. The Funder’s Network GREEN Funder’s Conference, November 2018
- Invited lecture, Leveraging 100%: How Cities are Leading the Clean Energy Revolution. Georgia Tech Industrial and Systems Engineering.
- Invited lecture, Leveraging 100%: How Cities are Leading the Clean Energy Revolution. Georgia Tech School of City and Regional Planning Invited Speaker Series.
- Invited speaker, *Clean Energy Costs and Benefits in Ohio’s Renewable Policy Efforts*, Georgia Solar Energy Association’s 2018 Georgia Solar Summit
- Invited speaker, *Bringing Analytics to the Energy Burden Conversation*, US Green Buildings Council 2018 Regenerative Design Summit
- Invited speaker, *First Convening of the Core Partners* for the American Cities Climate Challenge
- Invited speaker, *Energy Burden in the South Summit Panel* and *Atlanta’s 100% Clean Energy Plan* at the 2018 Just Energy Summit in Atlanta, GA at Morehouse College.
- Invited speaker, “Smart City 2.0; the Impact of Electric Vehicles” Presented by Georgia PSC Commissioner Tim Echols.
- Invited speaker, “Clean Energy in Atlanta.” Georgia Tech Association of Environmental Engineers and Scientists’ 2018 Annual Panel Discussion.
- Invited speaker, “Leveraging Energy Efficiency in Atlanta’s 100% Clean Energy Plan.” 2018 ACEEE Summer Study on Energy Efficiency in Buildings, Asilomar, August 13, 2018.
- Invited speaker, “Stepping Outside the Door: Using Building Energy Modeling to Understand the Impact of Energy Choices.” 2018 ASHRAE Annual Conference, Houston, June 24, 2018.
- Invited speaker, High Performance Buildings, Climate and Energy Efficiency, for Atlanta’s Youth Sustainability Ambassadors. June 12, 2018.
- Invited speaker, Atlanta’s 100% Clean Energy Plan for International Facilities Management Association. April 27<sup>th</sup>, 2018.
- Invited lecture, Breathing Easier – How Building Performance affects Public Health for GBES. April 19<sup>th</sup>, 2018.
- Invited speaker, Georgia Tech 5<sup>th</sup> Annual Energy Expo on clean energy transitions. April 12<sup>th</sup>, 2018.
- Invited speaker, Tulane’s Energy Benchmarking Symposium. March 14<sup>th</sup>, 2018.
- Invited lecture on 100% Clean Energy Plans in urban settings, for Georgia Tech PUBP/ISYE 8803, Energy Technology and Policy, Spring 2018.
- Invited speaker, *Sustainable Atlanta Roundtable on Atlanta’s 100% Clean Energy Plan*. December 8<sup>th</sup>, 2017.
- Invited speaker, *Ex Parte Briefing to the South Carolina Public Service Commission on SCE&G’s Generating Capacity Options*. November 28, 2017.

- Invited speaker, The Renewable Energy/Energy Efficiency Nexus, 2017 Vanderbilt Renewable Energy Conference, October 2017.
  - Invited speaker, Energy Efficiency, Current and Future (focus on energy data availability, both in use and in policy), at Transform, the 2017 Southeast Energy Efficiency Alliance Conference, October 2017.
  - Invited lecture, Sustainable Cities and Entrepreneurship, for CEE 4803F, Sustainable Cities, October 2017.
  - Invited speaker, Impacts of Energy Codes, for ASHRAE, May 15, 2017.
  - Invited lecture, Electricity Supply and Demand and its Effects, for ISYE/PUBP 8833, Utility Regulation and Policy, September 2017.
  - Expert leader, Partnerships for Big Impact on Energy Efficiency, Greenbuild International Conference and Expo, November 2015.
  - Invited speaker, Infrastructure and Workforce, 2<sup>nd</sup> Annual Energy Expo at Georgia Tech, April 2015.
  - Invited speaker, State and Local Dialogue, Accelerate Energy Productivity 2030, February 2015.
  - Invited speaker, Commercial Buildings and Progress in Atlanta, USGBC Emerging Professionals, February 2015.
  - Invited speaker, Impacts of Georgia's Solar Development Initiatives, at the Southern Solar Summit, September 2013.
  - Invited lecture on Georgia's solar energy programs and their social impacts, for CHBE 8801, Seminar on Nanostructured Materials and Energy, Fall 2013.
  - Invited lecture on urban sustainability and democratic participation, for PUBP 6604, Urban and Regional Policy Analysis and Planning, Fall 2013.
  - Invited lecture on quantitative environmental policy analysis using Monte Carlo simulation techniques and benefit-cost analysis, for PUBP 6201, Policy Analysis, Fall 2013.
  - Invited lecture on discount rates and the energy efficiency gap, for PUBP/ISYE 8803, Energy Technology and Policy, Spring 2013.
  - Invited lecture on policy research work and careers at the University of Dayton, March 2012.
  - Invited lecture on microeconomic deadweight loss and macroeconomic net benefits of subsidized combined heat and power deployment, for PUBP 6201, Fall 2011.
  - Invited lecture on policies for promoting renewable energy and the social cost of carbon, for PUBP/ISYE 8803, Energy Technology and Policy, Spring 2011.
-

## Electricity Burden in FPL Territory

A household's electricity burden is defined as the proportion of income used to pay for a household's annual electricity bill. Below are two maps showing FPL's territory. The map on the left displays the average electricity burden for all census tracts, while the map on the right demonstrates the number of households that are living above a certain burden threshold.

The average electricity burden for the entire state of Florida is **3.86%**, while the average electricity burden for FPL's territory is **3.20%**.

Comparing this to the national average of **2.56%**, FPL's territory experiences a electricity burden that is **1.25x higher** than the national average.

Households living above a 6.00% burden:

**1,360,259**

