

**STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH
DOCKET NO. E-2, SUB 1159
DOCKET NO. E-7, SUB 1156**

In the Matter of)	COMMENTS OF
Solar Integration Service)	FIRST SOLAR, INC.
Charge and its Application)	
to Competitive Procurement)	
for Renewable Energy Facilities)	

NOW COMES First Solar, Inc. (“First Solar”), pursuant to the Order Requesting Comments concerning Duke Energy’s proposed application of the Solar Integration Services Charge (“SISC”) to the Competitive Procurement for Renewable Energy (“CPRE”) Program facilities.

I. INTRODUCTION AND BACKGROUND

First Solar is a photovoltaic (“PV”) panel manufacturer and has sold over twenty-five gigawatts of PV panels worldwide and facilitated over \$17 billion in project financing. First Solar’s manufacturing facilities are located in Ohio and Southeast Asia. First Solar employs over 2,100 people in the United States. First Solar has developed, financed, engineered, interconnected, constructed and currently operates many of the world’s largest grid-connected solar power plants. First Solar has developed nearly six gigawatts of solar power plants in the United States. First Solar is the largest provider in the United States of operations and maintenance services for solar power plants.

In this industry-leading market position, First Solar has conducted research and built real-world experience to cost-effectively integrate large inverter-based, solar power plants into utility grids, including the development of operational control systems that

allow operators to minimize resource intermittency and provide essential grid services. These capabilities can be leveraged to design solar facilities with sufficient headroom and footroom to facilitate operation as capacity resources. With the right approach to implementing existing policy, that type of design, coupled with market-based incentives, will create the opportunity to smooth out the impacts of solar and load variability and thereby reduce grid congestion issues. In other words, utilization of solar's inherent capabilities combined with the correct policy can eliminate the need for the SISC.

By Order issued September 28, 2018, the Commission allowed First Solar to intervene in these dockets.

On July 2, 2019, the Commission issued its Order Modifying and Accepting Competitive ("CPRE") Program Plan, established the timeframe for the CPRE Program solicitation and directed parties to convene stakeholder meetings to address remaining issues in the CPRE Program.

On August 15, 2019, Duke Energy Progress, LLC ("DEP") and Duke Energy Carolinas, LLC ("DEC") (DEP and DEC, collectively, "Duke" or "Duke Energy") opened the 60-day pre-solicitation document review period, per Commission order, and indicated their intent to apply the Solar Integration Services Charge ("SISC") to CPRE Program facilities, if the Commission authorized Duke to impose an SISC in the 2018 biennial avoided cost proceeding (Docket No. E-100, Sub 158).

Pursuant to the Commission's July 2, 2019 Order, Duke convened, with the CPRE Independent Administrator ("IA"), monthly stakeholder meetings and invited pre-solicitation comments from CPRE market participants, in which First Solar participated.

During these processes, market participants, including First Solar, voiced concern about Duke's planned imposition of the SISC on CPRE Program facilities.

On October 7, 2019, the Commission requested comments from parties regarding: (1) whether the SISC should be applied to CPRE Program facilities; (2) if the SISC is applied to CPRE Program facilities, how would the SISC comport with specific statutory requirements; and (3) if the SISC is not to apply to CPRE Program facilities, how would that approach comport with N.C.G.S. § 62-110.8.

The CPRE Program request for proposals ("RFP") solicitation window opened on October 15, 2019.

On October 17, 2019, the Commission issued its Supplemental Notice of Decision in Docket No. E-100 Sub 158, establishing that for purposes of determining avoided costs, a QF which demonstrates that its facility meets the criteria specified by the Commission will be a "controlled solar generator" and that Duke will not be authorized to impose the SISC on such facilities. While the avoided cost ruling will apply to all QFs, the N.C.G.S. § 62-110.8(b) requirement that CPRE Program participants design their facilities to allow the utility to "dispatch, operate, and control the solicited renewable energy facilities in the same manner as the utility's own generating resources," will, if anything, exceed the requirements for a facility to be designated as a "controlled solar generator."

II. COMMENTS

First Solar files these comments to express concern that the imposition of an SISC is inconsistent with N.C.G.S. § 62-110.8 and that there are more cost-effective and operationally sound means Duke could employ to address renewable resource

intermittency. First Solar respectfully requests that the Commission not authorize the imposition of the SISC on CPRE Program facilities.

First Solar is aligned with and supports the comments of the North Carolina Clean Energy Business Alliance (“NCCEBA”) and the North Carolina Sustainable Energy Association (“NCSEA”) that the SISC is inconsistent with N.C.G.S. § 62-110.8. If the Commission does not authorize alternatives to the imposition of the SISC (as outlined below), First Solar further supports NCCEBA’s and NCSEA’s alternative proposal that the costs of the SISC be socialized.

A. The proposed imposition of the SISC on CPRE projects is inconsistent with N.C.G.S. § 62-110.8.

By implementing N.C.G.S. § 62-110.8, the General Assembly reformed the model by which North Carolina utilities procure energy from qualifying facilities (“QFs”), transitioning from a contracting-by-right model to a competitive procurement process. Traditionally, QFs have supplied power to North Carolina utilities under a “must take” energy-only contract, at the contracted avoided cost rate, supplying to the utility all power produced by the QFs, subject to curtailment rights of the utility.

N.C.G.S. § 62-110.8 marked a change in this operational model, directing developers away from designing projects that deliver only energy to the grid, and instead shifting to a model in which CPRE projects must be designed “to allow the procuring public utility rights to dispatch, operate, and control the solicited renewable energy facilities in the same manner as the utility's own generating resources.”¹

Consistent with N.C.G.S. § 62-110.8, the Commission has just recently issued notice of its decision that Duke “should not be authorized to impose the SISC on a solar

¹ N.C.G.S. § 62-110.8(b)(iii).

QF that is a ‘controlled solar generator,’ meaning, generally, any solar QF that demonstrates that its facility is capable of operating, and contractually agrees to operate, in a manner that materially reduces or eliminates the need for additional ancillary service requirements incurred by the utility.”² The CPRE Program requires that a facility must be a QF to be eligible to participate in that program. The General Assembly required all CPRE Program facilities to be able to be dispatched, operated and controlled by the utility. Through this legislative requirement and the Commission’s direction, CPRE Program facilities should be deemed “controlled solar generators” and therefore be exempt from the SISC. While successful bidder CPRE Program facilities in Tranche 1 were not contracted with this in mind, First Solar recommends that all CPRE Program facilities from Tranche 2 forward be contracted to be operated in such a manner. In Section II.B below, First Solar describes in greater detail how to include these capabilities contractually and why it is in ratepayers’ best interest for Duke to contract for these services with CPRE Program facilities.

The SISC, as proposed by Duke, frustrates the much needed and well-placed legislative direction for operational flexibility. Instead of dispatching, operating or controlling CPRE Program facilities in the same manner it would dispatch, operate and control own existing generating resources as provided for in N.C.G.S. § 62-110.8(b), Duke is ignoring the capabilities inherent in solar resources. Specifically, Duke assumes that the only way to smooth out solar and load variability is to use its existing thermal fleet to solve for intermittency. Based on that incorrect assumption, Duke proposes to shift the unnecessary cost of dispatching fossil fuel resources to mitigate intermittency through

² Supplemental Notice of Decision, Oct. 17, 2019, Docket No. E-100 Sub 158, ¶ 8, p. 2.

imposition of the proposed SISC on CPRE Program facilities. If the capabilities of solar resources were fully utilized, this unnecessary cost could be avoided. Consequently, if Duke is allowed to impose the SISC, CPRE project developers will incorporate the additional cost of the SISC into their CPRE Program bids, resulting in higher bid prices for the renewable facilities that the General Assembly intended Duke to procure.³ The unfortunate outcome of the SISC approach is likely to be higher prices for ratepayers.

This approach is economically and operationally inefficient, as CPRE Program facilities themselves can solve the issue of resource intermittency. In fact, CPRE Program facilities must stand ready to solve these operational issues, because the General Assembly specifically required that these facilities “allow the procuring public utility rights to dispatch, operate, and control the solicited renewable energy facilities in the same manner as the utility's own generating resources.”⁴

By directing CPRE Program facilities to have the ability to be dispatched, a capability which is intrinsic in solar project design today, the Commission would align CPRE procurement with clearly expressed legislative intent. In particular, to flexibly integrate onto the grid, the General Assembly intended for Duke to control and dispatch CPRE Program facilities more actively than it was able to do under the prior must-take energy contracting model. Rather than validate the SISC, which runs counter to the legislative directive of the CPRE Program, the Commission should address intermittency by requiring Duke to contract for this operational flexibility, which will allow Duke to mitigate variability while aligning CPRE procurement with the express language of N.C.G.S. § 62-110.8(b).

³ N.C.G.S. § 62-110.8(a).

⁴ N.C.G.S. § 62-110.8(b).

B. With direction from N.C.G.S. § 62-110.8(b) that Duke “dispatch, operate, and control the solicited renewable energy facilities in the same manner as the utility's own generating resources,” there exist other options for Duke to best integrate renewable resources.

Utility-scale solar assets are inherently highly controllable. Rather than lean on its legacy fossil assets, Duke should instead request that CPRE Program facilities provide both more visibility and dispatch flexibility, while providing direction to schedule these assets and take advantage of the CPRE projects’ obligations under N.C.G.S. § 62-110.8(b).

Other utilities such as NV Energy and the Hawaiian Electric Company are actively pursuing dispatchable renewable solar assets and compensating the renewable resources to meet system needs cost-effectively.⁵ In fact, by actively dispatching renewable resources these utilities are able to solve for multiple operational issues: more efficiently operating all of their resources at lower costs, reducing curtailment of solar resources, and proactively addressing renewables intermittency. As stated in previously submitted comments, and as shown in the study conducted by First Solar, E3, and the Tampa Electric Company, operating solar in a flexible manner can yield significant cost savings for the end user consumer.⁶ Duke can take advantage of this experience. Instead of imposing a punitive SISC to cover a more expensive method of addressing intermittency, Duke should take advantage of existing technology and more cost effectively incentivize solar resources to directly address and mitigate intermittency impacts. Put simply, leveraging solar resources to provide not only energy, but ancillary and balancing services as well, will lead to lower overall costs for consumers and even more attractive avoided costs for Duke.

⁵ Morgan Putnam, John Sterling and Mark Ahlstrom, ‘Grid-Flexible’ Solar and Wind – What It Means for Our Future, (Jan. 28, 2019).

<https://www.esig.energy/grid-flexible-solar-and-wind-what-it-means-for-our-future/>

⁶ See Nelson, J. et al. October 2018. *Investigating the Economic Value of Flexible Solar Power Plant Operation*. Energy & Environmental Economics. <https://www.ethree.com/wp-content/uploads/2018/10/Investigating-the-Economic-Value-of-Flexible-Solar-Power-Plant-Operation.pdf>.

First Solar recommends that the Commission direct Duke to eliminate the SISC for CPRE Program purposes and, at a minimum, seek to procure the flexible dispatch services from CPRE Program facilities which CPRE projects are required to provide under N.C.G.S. § 62-110.8(b). Further, to better integrate these renewables into its dispatch stack, Duke should incorporate solar forecasting and scheduling of assets in fifteen-minute increments. These changes can be implemented for CPRE Tranche 2 through modest PPA modifications and discrete operational changes, which would make that solicitation more consistent with the legislative mandate for the CPRE Program.

1. Inverter-based renewable resources can deliver ancillary services more effectively than traditional generation assets, and Duke should request from and compensate CPRE projects to provide these services.

Inverter-based renewable resources, such as utility-scale solar, are more effective than traditional generation assets in delivering ancillary services. First Solar noted these capabilities to the Commission in these dockets at a point in time before Duke proposed to apply the SISC to CPRE Program facilities.⁷

Specifically, the March 2017 study entitled “Demonstration of Essential Reliability Services by a 300-MW Solar Photovoltaic Power Plant” demonstrated, in a real-world test, that a utility-scale solar plant equipped with advanced control technology, can provide essential reliability services such as frequency control, voltage control, and ramping capability or flexible capacity.⁸ That demonstration also showed that digitally-controlled inverters respond more accurately than dispatched thermal resources, outperforming the

⁷ In its Comments filed March 22, 2019, in these dockets First Solar discussed these capabilities. While Duke proposed the SISC in its biennial avoided cost docket (Docket No. E-100 Sub 158), Duke indicated in August 2019 that it proposed to apply the SISC to CPRE Program Tranche 2 projects. Duke further discussed the potential imposition of the SISC during the September 12, 2019, stakeholder meeting with market participants, facilitated by the IA. Duke filed a report of the meeting in these dockets on September 16, 2019. Duke filed its *pro forma* Tranche 2 PPA on September 16, 2019, in these dockets, with a SISC placeholder.

⁸ See First Solar Comments filed March 22, 2019, p. 6, and Appendix 3 to those Comments.

accuracy of fast-gas turbines by an average of 42%.⁹ Given that a solar facility incurs no additional incremental fuel costs to perform these functions, inverter-based resources can also provide these services cost-effectively.

As noted above, providing this type of resource flexibility is consistent with the legislative mandate, and First Solar continues to advocate for Duke to adopt and utilize this flexibility. Instead of leveraging the precision and cost-effectiveness inherent to inverter-based renewable resources, Duke is proposing to control and operate its existing generation fossil fleet to solve for renewable intermittency. Failure to use solar resources to provide ancillary services will likely lead to higher costs because Duke's operation of its existing fleet is an "incrementally more expensive" approach. Specifically, in this regard Duke witness Wintermantel noted:

Increasing ancillary service requirements forces the system to commit more generating resources which allows generators to dispatch at lower levels giving them more capability to ramp up and down. ***There is a cost to this increase in ancillary services because generators are operated less efficiently*** when they are dispatched at lower levels. Generators may also start more frequently which also increases costs. As solar penetrations continue to rise, ***carrying additional ancillary services to ameliorate solar uncertainty with the conventional fleet becomes incrementally more expensive.***¹⁰

(Emphasis added).

Duke should instead seek to receive these services and compensate for them directly from assets procured through the CPRE Program, consistent with the legislative directive set forth in N.C.G.S. § 62-110.8. By doing so, Duke can both lower costs and avoid the increased emissions that would result from its provision of these ancillary services. Stated simply, if Duke believes that CPRE Program assets create specific

⁹ *Id.*

¹⁰ Wintermantel testimony, Docket No. E-100 Sub 158, May 21, 2019, Exhibit 2, p. 3.

integration challenges, it should first turn to those resources to provide solutions, rather than leaning on legacy inefficient fossil assets.

2. Duke should implement more granular solar forecasting to accurately assess solar production that will allow it to anticipate and more actively control for variability.

Solar forecasting can provide a highly accurate picture for solar generation as the operating interval gets closer to the time of delivery. Duke's contract requires hourly forecasts on a day-ahead basis (in addition to week-ahead and year-ahead forecasts).¹¹ First Solar recommends two specific additions to the forecasting process that will allow Duke greater visibility into potential renewable production.

First, First Solar recommends the addition of an hour-ahead forecast. Hour-ahead forecasting is significantly more accurate than day-ahead forecasting and can provide greater certainty to Duke as to the amount of energy to be expected within the operating hour. Second, First Solar recommends that this hour-ahead forecast be provided on a fifteen-minute granularity. This additional level of detail will allow Duke to better understand the ramping needs of the system, particularly in the morning and evening hours as the solar resources are coming online and ramping offline, respectively.

III. CONCLUSION

The General Assembly contemplated that CPRE projects were to be more flexibly operated, dispatched and integrated into Duke's system than must-take resources. The SISC approach proposed by Duke is inconsistent with this legislative direction because it uses more expensive existing resources to mitigate intermittency and fails to take

¹¹ See Section 9.4 Forecasts in the Tranche 1 CPRE Renewable Power Purchase Agreement.

advantage of the inherent capabilities of solar resources to mitigate intermittency – capabilities required by the CPRE Program.

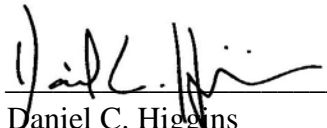
As previously proposed to the Commission in these dockets,¹² First Solar continues to believe that transitioning to a capacity payment or tolling agreement PPA structure would effectively solve for a number of operational challenges, including those Duke seeks to address by imposing the SISC. Additionally, such a PPA structure would be in the best interest of ratepayers, utilities and developers. First Solar encourages the Commission to implement a capacity payment PPA structure for Tranche 3.

However, until such a PPA structure is developed for the CPRE Program, First Solar encourages the Commission to incorporate incremental changes as discussed to the current Tranche 2 solicitation. For Tranche 2, CPRE Program facilities can solve for intermittency challenges more cost-effectively and efficiently than Duke's proposed SISC by using operational capabilities inherent in solar resources. Doing so would be more consistent with the legislative intent that CPRE Program facilities be operated flexibly. In addition, this approach will be consistent with the Commission's recent decision that QF facilities which are operated flexibly be considered a "controlled solar generator" and be exempt from the SISC. Rejection of the SISC charge, as applied to CPRE Program facilities, will ultimately result in better operational outcomes, reduced costs for ratepayers, and reduced emissions from inefficiently run plants.

¹² First Solar proposed a capacity payment PPA in its March 22, 2019 Comments in these dockets.

Respectfully submitted, this the 18th day of October, 2019.

BURNS, DAY & PRESNELL, P.A.

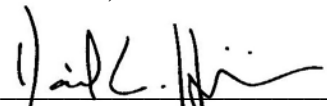
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CERTIFICATE OF SERVICE

I hereby certify that a true and exact copy of the foregoing has been served on all counsel of record in this docket, by either depositing same in a depository of the United States Postal Service, first-class postage prepaid and mailed by the means specified below, or by electronic delivery.

This the 18th day of October, 2019.

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