

DOCKET NO. E-100, SUB 101

In the Matter of  
Petition for Approval of Revisions to  
Generator Interconnection Standards

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ORDER GRANTING WAIVER  
AND REQUIRING REPORT

[h]ost stakeholder and TSRG [technical standards review group] meetings dedicated to the question of whether a process for re-studying an existing Generating Facility for the addition of energy storage could be more efficient than requiring the Facility to submit a new Interconnection Application. On or before September 3, 2019, the Utilities shall file a streamlined process for efficiently studying the addition of storage at existing generation sites that builds upon the grouping study approach that is already under development . . . .

Also on September 3, 2019, Dominion Energy North Carolina (DENC) filed its comments on the efficient study of storage facilities being added to existing Generating Facilities. DENC states that Section 3.4.5 of the Interconnection Agreement provides that an existing Generating Facility must receive written authorization from the Utility before making any change that might have a material impact on the safety or reliability of the Utility's System. "The Company believes that the NCIP [North Carolina Interconnection Procedures] Interconnection Request process . . . currently provides, at least for DENC's purposes, a sufficient framework and process for the efficient study" of facility changes.

such as the addition of battery storage to an existing generation site. DENC next describes the study methods that it would conduct under various facility configurations.

On September 30, 2019, Duke filed its proposal for an expedited study process for the addition of storage at existing generation sites, which Duke identifies as the Energy Storage System (ESS) Retrofit Study Process.

Comments and reply comments were filed on Duke's ESS Retrofit Study Process by the North Carolina Clean Energy Business Alliance (NCCEBA), the North Carolina Sustainable Energy Association (NCSEA), and the Public Staff.

### **Summary of Duke's Initial ESS Retrofit Study Process Proposal**

The ESS Retrofit Study Process begins with Duke's acceptance of interconnection requests seeking to add storage to existing generation sites (ESS Retrofit Interconnection Request). Duke proposes to open a one-time enrollment window for ESS Retrofit Interconnection Requests within 30 calendar days after a Commission order is issued approving any necessary revisions to the NCIP. The submission window for ESS Retrofit Interconnection Requests will then remain open for 90 calendar days after opening. Duke anticipates that efforts to facilitate the proposed System Impact Grouping Study will require 60 calendar days after the enrollment window closes and that additional time may be needed to process applications before starting the grouping study, depending on the volume of applications and when they are received in the enrollment window. To be eligible for the ESS Retrofit Study Process, solar facilities must meet the following requirements: (1) have received a North Carolina Interconnection Agreement from Duke prior to the date on which the window opens for enrollment; (2) seek to add storage to an existing site and have no change of point of interconnection; (3) not exceed the Maximum Physical Export Capability of the applicable Interconnection Agreement; (4) pass engineering review of transformer, inverter, and site configuration; (5) be DC-coupled or have a hybrid inverter, subject to review; (6) for transmission-connected sites, for protection and stability purposes, retain the inverters that were originally studied; (7) propose to charge only from the existing generating facility specified in the Interconnection Agreement and not from the Utility system; and (8) be certified to applicable IEEE, UL, and OSHA codes and standards.

Duke proposes several levels of review to evaluate the impact of the proposed ESS retrofit on the distribution and transmission systems. Duke would conduct an initial technical review of an ESS application to confirm eligibility and technical compliance. Duke notes that if violations (e.g., voltage or thermal) are identified at any point in the ESS Retrofit Study Process (which generally require additional Interconnection Facilities or Upgrades), the project will be required to submit a new Interconnection Request and receive a new queue position and proceed with the storage addition in accordance with the NCIP process applicable to Material Modifications. Additionally, Duke notes that because existing solar generation sites have already been studied based on Maximum Physical Export Capability during daylight hours (i.e., between 9 a.m. and 5 p.m.), those facilities seeking to add storage for discharge only during daylight hours will not require

further review, and the applicable Interconnection Agreement will be amended to reflect such limitation on discharge.

Beyond the technical review, the study process would next entail a distribution impact review and, for facilities greater than 250 kW, a transmission impact review.

All of the projects participating in the enrollment window would be studied in a grouping study using a base case that includes only those projects in the queue that have received a full System Impact Study report. Duke explains that this grouping study process will allow Duke to proceed more quickly than if the transmission impacts of each project were studied individually. Through the grouping study, a project that results in significant flows on the transmission system would be required to submit a new Interconnection Request rather than proceed further with the ESS Retrofit Study Process.

With respect to interconnection queue equity concerns, Duke explains that the capacity of its transmission and distribution lines is finite. Further, Duke explains that the NCIP utilizes a serial study process, meaning that projects are assessed for system impacts based on their relative position in the serial interconnection queue. Earlier-queued projects therefore have the right to utilize available transmission and distribution capacity prior to later-queued projects. Duke notes that while its proposal for a one-time option to add storage does not alter the fact that such additions of storage may result in later-queued projects being assigned Upgrades that such projects would not otherwise have been assigned, it does limit the potential additional study costs and delays that result from allowing interconnected projects to add storage outside of the serial study process. Duke stated that implementing a proposal to streamline the interconnection process for adding storage at an existing site could result in allegations of discrimination “to the extent that this process is deemed to allocate system capacity in a manner contrary to the [current] serial process.” Nevertheless, Duke provided the proposal in response to the Commission’s order.

### **Comments and Reply Comments on Duke’s Initial ESS Retrofit Study Process Proposal**

On October 15, 2019, the Commission issued an Order Allowing Comments and Reply Comments Regarding Proposed Expedited Study Process for Adding Storage to Generation Sites. In that order the Commission specifically requested that the parties comment on the issue of potential discrimination allegations.

On November 8, 2019, the Public Staff filed its comments on Duke’s initial ESS Retrofit Study Process. The Public Staff states that Duke hosted two stakeholder meetings at which Duke described its proposed approach and solicited feedback from participating stakeholders. The Public Staff reports that during the stakeholder meetings much of the discussion concerned defining the appropriate study period when adding storage to an existing site. Both Duke and DENC proposed a 24-hour study period, which the Public Staff initially opposed as overly conservative. However, “Duke explained that limiting the study period to a [specific] period of the day would not be likely to change the

results . . . for most projects.” Since it is the Public Staff’s understanding that NCCEBA and NCSEA “do not oppose the 24-hour study process,” the Public Staff does not oppose it.

The Public Staff states that another issue that was discussed by the stakeholders was Duke’s proposal for a one-time enrollment window. The Public Staff reports that many stakeholders expressed opposition to a single 90-day window and would prefer additional windows to be offered. However, the Public Staff

believes the one-time enrollment window is appropriate to limit concerns regarding discrimination between existing facilities and later queued projects that may be adversely impacted by the addition of storage to those facilities. The Public Staff agrees with stakeholders, however, that if queue reform to move to a grouping study process is not implemented by the end of 2020, consideration of an additional enrollment window would be appropriate.

As to the possibility that Duke’s ESS Retrofit Study Process proposal will result in allegations of discrimination, the Public Staff states that this is a possibility where “upgrade costs that would not have otherwise been assigned but for the addition of storage to an existing facility” are now assigned to a later-queued project, and

further agrees with Duke’s proposal that a one-time enrollment window for the addition of storage is appropriate to limit potential impacts to later queued projects. While this approach does not eliminate all potential impacts . . . , the Public Staff believes that the proposal for a one-time enrollment window is a reasonable approach that balances the interests of adding storage, which will have the benefit of either reducing volatility and/or providing generation at times when it has the most value to customers, and maintaining equitable treatment of later queued projects.

The Public Staff notes that it sought clarification from Duke regarding whether projects that have an “off-ramp,” or are exempt from the study process, would be limited to the one-time enrollment window. After discussions with Duke, it is the Public Staff’s understanding that projects that do not change the export from the previously studied window (9 a.m. to 5 p.m.) and do not change their overall AC capacity, are not limited to the one-time enrollment window but may apply for an expedited interconnection study process to add storage generation at any time. The Public Staff notes that these facilities must still notify the utility of their plan to modify the facility or add equipment, consistent with Section 1.5.3 of the NCIP. The Public Staff believes allowing the projects that qualify for the off-ramp to add storage is an appropriate approach and does not raise equity concerns in the interconnection queue because these projects should not result in delays or upgrade costs for later queued projects as their impact has already been studied by the utilities.

The Public Staff recommends that Duke file a report with the Commission regarding the results of the ESS Retrofit Study Process. Finally, the Public Staff requests that Duke address in its reply comments whether facilities that go through the ESS Retrofit Study Process would be subject to the Energy Storage Protocols that are being discussed in the current avoided cost docket, Docket No. E-100, Sub 158, and the CPRE dockets, Docket Nos. E-2, Sub 1159 and E-7, Sub 1156.

On November 8, 2019, joint comments were filed by NCCEBA and NCSEA. NCCEBA and NCSEA state that they participated in Duke's stakeholder meetings and participated in further discussions with Duke in an effort to reach agreement about an appropriate process. As a result of those additional discussions, NCCEBA and NCSEA report that Duke has agreed to modify its process to include the following: (1) if the Commission has not approved Duke's queue reform proposal by the end of 2020, Duke will facilitate an additional ESS Retrofit Study enrollment window to begin one year following the close of the first ESS enrollment window; (2) Duke will hold a stakeholder meeting to review the results of the transmission impact analysis that it conducts during the ESS Retrofit Study Process; and (3) if a solar developer obtains Critical Electric Infrastructure Information (CEII) clearance, Duke will provide the power system simulation (PSSE) case to the developer. NCCEBA and NCSEA report that with these modifications, they agree to Duke's proposed process.

On December 6, 2019, Duke filed a letter in response to the joint comments of NCCEBA and NCSEA and the comments of the Public Staff. In summary, Duke believes that the ESS Retrofit Study Process should be approved by the Commission as clarified by the following points.

Duke agrees with NCCEBA and NCSEA that if the Commission has not approved Duke's queue reform proposal by the end of 2020, an additional Energy Storage Retrofit enrollment window, to commence approximately one year following the close of the initial enrollment window, would be appropriate. Duke also agrees with the Public Staff and with NCCEBA and NCSEA that it would be appropriate to hold a stakeholder meeting to review the ESS Retrofit Study results following the transmission impact analysis. During the stakeholder meeting, Duke will present information showing the results of the study, including tables of Distributed Factors Files on the various facilities. If a party has obtained CEII clearance, Duke will provide the PSSE case to the party.

Duke affirms the Public Staff's understanding that projects that do not change their export of power from the previously studied window (9 a.m. to 5 p.m.) and do not change their alternating current capacity may apply for an expedited interconnection study process to add storage at any time. Finally, Duke agrees with and accepts the Public Staff's recommendation that it file a report in this docket giving an overview of the process, including the number of facilities that applied, the number that were eligible for expedited review, the number that passed the review, the total storage capacity that was approved to be added, and a brief summary of the reasons that projects failed the review.

In response to the Public Staff's request that Duke address whether facilities that go through the ESS Retrofit Study Process should be subject to the Energy Storage Protocols that are being discussed in the avoided cost and CPRE dockets, Duke notes that this issue does not directly impact the ESS Retrofit Study Process. However,

Duke supports requiring energy storage protocols for all generation plus energy storage facilities in order to effectively integrate those facilities into the grid. Accordingly, to the extent that an existing facility were to add storage, the Companies would require the facility to conform to the Companies' currently applicable Energy Storage Protocols through the applicable PPA [power purchase agreement].

In summary, Duke believes that the ESS Retrofit Study Process, as clarified in its letter dated December 6, 2019, should be approved by the Commission. As to potential discrimination concerns, Duke acknowledges that its initial proposal identified certain queue equity/discrimination concerns but that after further internal consideration of the issue, Duke has concluded that the structure of its proposed ESS Retrofit Study Process makes it extremely unlikely, if not impossible, that a later-queued project would be negatively impacted.

### **Duke's Petition for Waiver**

On January 17, 2020, Duke filed a Petition for Waiver in which Duke requests that the Commission grant a waiver from the NCIP to allow Duke to implement the final ESS Retrofit Study Process, as set forth in Exhibit A to its petition. The final ESS Retrofit Study Process includes additional details regarding the screening and studies that Duke will perform as part of the process, as well as an expanded list of industry codes that would apply to participating facilities. Additionally, as reflected in the final ESS Retrofit Study process, a Generating Facility that completes the ESS Retrofit Study Process will be required to execute an amended Interconnection Agreement, and the process provides for site inspections and post-commissioning inspections consistent with Section 6.5 of the NCIP.

The final ESS Retrofit Study Process includes: (1) Attachment A, the ESS Retrofit Study Process Application; (2) Attachment B, an amendment to the Interconnection Agreement for Generating Facilities that add energy storage under the ESS Retrofit Study Process; and (3) Attachment C, an amendment to the Interconnection Agreement for facilities adding ESS for operation during daylight hours only. Participating Interconnection Customers would be required to provide a non-refundable processing fee of \$1,000 and if the customer proceeds beyond the eligibility screening, a study deposit of \$5,000 to cover Duke's study costs, subject to a true up.

Finally, under the final ESS Retrofit Study Process, the enrollment window would open by the later of 30 calendar days after the Commission's order granting this waiver

is issued or 30 calendar days after the Commission's final order in the current avoided cost proceeding, Docket No. E-100, Sub 158. Duke notes that in that docket,

the Commission is considering what [PPA] modifications and rates would apply to a currently operating facility that elects to add ESS before the expiration of its existing PPA. Thus, the opening of the ESS Retrofit Study Process enrollment window is tied to the issuance of a final order in that docket, which is the point in time at which Generating Facility owners will have sufficient clarity to determine whether to retrofit existing facilities with ESS.

## **Discussion and Conclusions**

The Commission has reviewed Duke's initial and final ESS Retrofit Study Process proposals and all of the parties' comments thereon. The Commission notes that the parties have worked collaboratively to address concerns and provide clarification, where necessary, such that the parties support the Commission's approval of Duke's ESS Retrofit Study Process.

Under Duke's final ESS Retrofit Study Process, a participating Generating Facility must start over via the regular interconnection process if the addition of solar at its site would drive additional Interconnection Facilities or System Upgrades. Similarly, if a participating Generating Facility would cause a significant impact to the transmission system, that Generating Facility would be required to submit a new Interconnection Request rather than proceed further with the ESS Retrofit Study Process. In both instances, the Interconnection Customer's new request would put them at the end of the existing queue. Further, by using a base case that includes all projects that have already received a System Impact Study report, Duke's proposed ESS Retrofit Study Process should drive few if any re-studies for other projects in the queue. The Commission recognizes that the grouping study/queue reform proposal under development should more easily accommodate the addition of storage at existing Generating Facilities, such that future enrollment windows should not be necessary if those reforms are implemented in a timely fashion. These elements of the ESS Retrofit Study Process will work to protect the interests of other pending interconnection requests.

Duke's petition filed on January 17, 2020, references the fact that the Commission has had under consideration in the current avoided cost proceeding what power purchase agreement modifications and rates would apply to a currently operating facility that elects to add energy storage before the expiration of its existing PPA. Duke further notes that the proposed opening of the ESS Retrofit Study Process enrollment window is tied to the issuance of a final order in that docket, which is the point in time at which Generating Facility owners will have sufficient clarity to determine whether to retrofit existing facilities with energy storage. As provided in the Commission's April 15, 2020 avoided cost order:

[T]he Commission agrees with the Utilities and the Public Staff that it is inappropriate to compensate QFs for new capacity and energy at prior

avoided cost rates under contracts that do not reflect current avoided costs and do not align price signals with the highest needed capacity windows. However, the Commission recognizes the concerns raised by several intervenor-parties and the Public Staff that requiring existing or “committed QFs” to enter into a new PPA and forfeit prior, higher avoided cost rates will discourage QFs from adding storage, which if allowed under new rate design hours, could allow intermittent generation to sell energy and capacity at times of greatest value to the utility and its ratepayers.

The Commission finds persuasive NCSEA’s argument that removing barriers to energy storage is particularly important in North Carolina because the amount of utility-scale solar that is already installed surpasses that of any other state except California. The Commission also notes the testimony of NCSEA’s witnesses that energy storage is now a cost-competitive option, that there is likely to be a substantial deployment of storage before the next avoided cost biennial proceeding, and that energy storage will play a significant role in enabling a more affordable, reliable, and sustainable electricity system.

Order Establishing Standard Rates and Contract Terms for Qualifying Facilities, *Biennial Determination of Avoided Cost Rates for Electric Utility Purchases from Qualifying Facilities – 2018*, No. E-100, Sub 158, at 130 (N.C.U.C. Apr. 15, 2020).

Because the Commission concluded that allowing QFs to add storage at bifurcated avoided cost rates raises a multitude of challenging administrative and regulatory issues, including the development of metering and communication standards and new commercial PPA terms, that have not been fully considered, the Commission directed the parties to the proceeding to investigate the compromise proposed by the Public Staff of separately metering battery storage and compensating additional output at the then-current avoided cost rate as a potential solution to encourage the addition of battery storage in a manner that is fair to ratepayers. The Commission directed the parties to engage in a stakeholder process and established a deadline of September 1, 2020 for reporting back to the Commission on the outcome of the process.

With respect to Duke’s queue reform proposal, the Commission notes that the Parties agree that if the Commission has not approved Duke’s queue reform proposal by the end of 2020, an additional enrollment window would be appropriate. In recognition of the efforts expended by the parties to achieve consensus on Duke’s ESS Retrofit Study Process and to meet the expectation of the parties regarding the resolution of matters to be addressed through the stakeholder process established in the avoided cost proceeding and the opportunity to participate in the ESS Retrofit Study Process, the Commission concludes that, if the Commission has not approved Duke’s queue reform proposal by the end of 2020, Duke is authorized to open an additional enrollment window to commence approximately one year following the close of the first enrollment window.



Finally, the Commission notes that Duke, the Public Staff, NCSEA, and NCCEBA agree that it is appropriate to allow an existing Generating Facility to add storage for operation only during daylight hours at any time and outside of the ESS Retrofit Study Process. As such, the Commission will require Duke to file Attachment C, and any other necessary conforming language, as proposed changes to the NCIP on or before May 15, 2020.

Therefore, the Commission concludes that it is appropriate to approve Duke's ESS Retrofit Study Process as described in the Companies' January 17, 2020 Petition for Waiver and consistent with Duke's statements of clarification made in its December 6, 2019 letter filing. Duke shall file its report on the ESS Retrofit Study Process results within two months of the conclusion of that process.

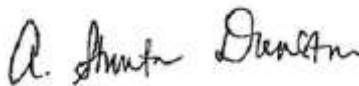
IT IS, THEREFORE, ORDERED as follows:

1. That Duke's proposed ESS Retrofit Study Process as described in Duke's January 17, 2020 Petition for Waiver and consistent with Duke's statements of clarification made in its December 6, 2019 letter filing shall be, and is hereby, approved;
2. That Duke shall open the enrollment window for the ESS Retrofit Study Process 30 days from today; and
3. That Duke shall file its report on the ESS Retrofit Study Process results within two months of the conclusion of that process.

ISSUED BY ORDER OF THE COMMISSION.

This the 28th day of April, 2020.

NORTH CAROLINA UTILITIES COMMISSION

A handwritten signature in dark ink, appearing to read "A. Shonta Dunston".

A. Shonta Dunston, Deputy Clerk