

NCSEA and SACE, et al.  
Docket No. E-100 Sub 179  
Carbon Plan – 2022  
Joint Data Request No. 3  
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**DUKE ENERGY CAROLINAS, LLC AND DUKE ENERGY PROGRESS, LLC**

**Request:**

Referring to Appendix E, Table E-31 and E-32. Please provide the underlying calculations and justification for the annual selection constraints applied to solar in both the base and high case.

**Response:**

The Companies do not have specific underlying calculations for the annual selection constraints. These constraints are based on engineering judgement and transmission planning experience. The transmission expansion needs and the time to construct new transmission infrastructure to accommodate increasing levels of renewables and other resources as described in Appendix P are critical factors influencing the annual solar interconnection constraints in the model. Additional factors, as described in response to CPSA DR1-8, include:

- Increasingly complex interconnections as solar facilities are located farther from existing infrastructure and load centers
- Unknown future solar project size and impacts on interconnections. Generally larger projects should enable more aggregate MWs to be connected on an annual basis, but it is unclear what the size of projects will be in the future and whether larger projects will lead to additional transmission expansion projects beyond those contemplated in Appendix P.
- Finite interconnection resources allocated to non-solar resources. Details of potential other non-solar resources can be found throughout the Carbon Plan including Chapter 3 and Appendix E.
- Historic annual interconnection data shows the average annual new solar capacity added to the grid is approximately 520 MW/year since 2015. While not the primary determining factor in developing the solar interconnection capability in the Carbon Plan, it is important to note that Carbon Plan allows for over 3x this annual amount in Portfolio A1 and over 2.5 X this annual amount in all other portfolios.
- Land availability and community acceptance. While not described in great detail in the Carbon Plan, 1,350 MW/year of solar will require approximately 10,800 acres/year of land to be developed, and 1,800 MW/year will require approximately 14,400 acres/year. Community acceptance of this level of development is an unknown factor that may impact the amount of solar that can be added annually.

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- Energy storage development will be important to ensure energy supply meets demand and delays in storage development can limit the effectiveness of solar deployments needed to meet the goals of the Carbon Plan.

Additional SME: Sammy Roberts; GM Transmission Planning and Operations Strategy

Responder: Matthew Kalemba, Director DET Planning & Forecasting