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June 1, 2023

Via Electronic Filing

Mr. Bernard Logan, Clerk
State Corporation Commission
Document Control Center
1300 East Main Street - 1st Floor
Richmond, VA 23219

Re: Petition of Virginia Distributed Solar Alliance for Injunctive Relief against Virginia Electric and Power Company
Case No. PUR-2023-00097

Dear Mr. Logan:

Enclosed for filing is the *Complaint and Petition for Injunctive Relief and Request for Expedited Action on behalf of Virginia Distributed Solar Alliance,* in the above referenced matter.

Virginia Distributed Solar Alliance is providing service of documents in this case exclusively via email unless parties request otherwise. If any party copied on this correspondence would like to receive hard copies of documents, such party is asked to let me know that.

Should you have any questions concerning this filing, please contact me at (804) 799-4128. Thank you for your assistance in this matter.

Sincerely,

Cliona Mary Robb

Cliona Mary Robb

Enclosures

cc: Certificate of Service

COMMONWEALTH OF VIRGINIA

STATE CORPORATION COMMISSION

PETITION OF

VIRGINIA DISTRIBUTED SOLAR ALLIANCE CASE NO. PUR-2023-_____

For injunctive relief against
Virginia Electric and Power Company

COMPLAINT AND PETITION FOR INJUNCTIVE RELIEF AND REQUEST FOR EXPEDITED ACTION

Pursuant to Rule 100 of the Rules of Practice and Procedure of the State Corporation Commission ("Commission"), 5 VAC 5-20-100(C), and Rule 100 (20 VAC 5-314-100(D))[1] of the Commission's Regulations Governing Interconnection of Small Electrical Generators (20 VAC 5-314-10 *et seq.*) (the "Interconnection Rules"), Virginia Distributed Solar Alliance ("VA-DSA" or "Petitioner"), by counsel, respectfully submits this petition for injunctive relief and request for expedited action (the "Petition") against Virginia Electric and Power Company, d/b/a Dominion Energy Virginia ("Dominion"). In support thereof, VA-DSA states the following:

IDENTITY OF THE PARTIES

1. VA-DSA is a group of solar power developers and other solar advocates who have filed this Petition in support of preserving opportunities for behind-the-meter, small-scale, net-metered solar projects that serve eligible non-residential customer-generators[2] ("Customer Generators") ranging from 250 kW to 1 MW, such as public entities, non-profits, and private businesses, including K-12 schools, hospitals, churches, and local governments.

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[1] Notice of this dispute was provided by letter dated April 25, 2023 from Anthony E. Smith, PhD and acknowledged by letter from Nathan Frost of Dominion dated May 4, 2023.

[2] Va. Code § 56-594, *Net energy metering provisions*, subsection B (defining non-residential net metering customers).

2. Dominion is an investor-owned incumbent public utility organized and operated under the laws of the Commonwealth of Virginia and regulated by the Commission. Dominion provides electric service to the public within its service territory.

STATEMENT OF THE ACTION

3. Petitioner seeks an injunction from the Commission directing Dominion to immediately suspend the Interconnection Parameters for Net Metering Distributed Energy Resources ("DER"), issued by Dominion on December 20, 2022 ("Parameters")[3] and to suspend recently adopted interconnection practices, for certain projects. The Parameters address projects under 250 kW, projects that range from 250 kW to just under 1 MW, and projects that range from 1 MW to 3 MW.[4] Due to the substantial and irreparable harm imposed by the Parameters on behind-the-meter projects that range from 250 kW up to 1 MW, which are midsized nonresidential net energy metering projects ("Midsized NEM Projects"), the suspension of the Parameters (and recently adopted interconnection practices) on an expedited basis for such projects is required to avoid imposing unreasonable and unprecedented costs, delays, and barriers that are not necessary for behind-the-meter projects interconnecting with Dominion's distribution system, until the Commission resolves the issues being addressed in Commission Docket Nos. PUR-2022-00073 and PUR-2023-00069. An expedited injunction pending the Commission's findings regarding interconnection issues in these dockets is necessary to restore the status quo for continuing to safely and reliably interconnect Midsized NEM Projects consistent with Virginia laws governing

[3] See Exhibit A for a true and accurate copy of the Dominion Parameters.
[4] In 2020, Va. Code § 56-594, *Net energy metering provisions*, was amended to increase the cap from one megawatt to three megawatts for nonresidential net metering in Dominion territory.

interconnection[5], net metering[6], and power purchase agreements ("PPAs"),[7] which existed prior to the imposition of the requirements documented in the Parameters.[8] As part of this injunctive relief, Petitioner seeks to have the Commission prohibit Dominion's recent practice of requiring Customer Generators to sign a Small Generator Interconnection Agreement ("SGIA"), which undermines the duties and obligations set forth in solar PPAs between Customer Generators and their solar providers that are entered into pursuant to the PPA Law.

LEGAL BASIS FOR THE COMMISSION'S JURISDICTION

4. The Commission has jurisdiction over the dispute described in this Petition. The Commission has the power and is charged with the duty of regulating the rates, charges, services, and facilities of utility companies operating within the Commonwealth.[9] The Constitution of Virginia and statutes enacted by the General Assembly give the Commission broad authority over the control and regulation of public service companies.[10]

5. The Code provides that "[a]ny person aggrieved by anything done or omitted in violation of any of the provisions of [Title 56], by any public service corporation chartered or doing business in the Commonwealth, shall have the right to make complaint of the grievance and seek relief by petition against such public service corporation before the State Corporation Commission, sitting as a court of record."[11] When such a grievance is established, the Commission

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[5] Va. Code § 56-578, *Nondiscriminatory access to transmission and distribution system* ("Interconnection Law") and 20 VAC 5-314-100 *et seq., Regulations Governing Interconnection of Small Electrical Generators* ("Interconnection Rules").
[6] Va. Code § 56-594, *Net energy metering provisions* ("NEM Law") and 20 VAC 5-315-100 *et seq, Regulations Governing Net Energy Metering* ("NEM Rules").
[7] Va. Code § 56-594.02. *Solar-powered or wind-powered electricity generation; power purchase agreements; pilot programs* ("PPA Law").
[8] Dominion began to unilaterally impose onerous and unprecedented requirements on Midsized NEM Projects in early October of 2022, but it did not comprehensively document such requirements in writing until the Parameters were issued on December 20, 2022. *See* Exhibit L (Secure Futures May 2023 Letter), opening paragraph.
[9] Va. Const. Art. IX, § 2.
[10] *Piedmont Envtl. Council v. Va. Elec. and Power Co.*, 278 Va. 553, 562, 684 S.E.2d 805, 810 (2009).
[11] Va. Code § 56-6.

has jurisdiction, by injunction, to restrain the public service corporation from continuing the violation and to require compliance with the requirements of law.[12]

6. The Code also provides that "[t]he Commission shall have the power, and be charged with the duty, of supervising, regulating, and controlling all public service companies doing business in this Commonwealth, in all matters relating to the performance of their public duties and their charges therefor, and of correcting abuses therein by such companies."[13]

7. The Commission is empowered, upon finding the practices or acts of a public utility are "unjust, unreasonable, insufficient, preferential, unjustly discriminatory or otherwise in violation of law or if it be found that any service is inadequate or that any reasonable service cannot be obtained," to substitute therefore and make orders respecting changes in such practices and acts as shall be just and reasonable.[14]

8. Accordingly, the Commission has jurisdiction to provide the relief requested by Petitioners.

LEGAL BASIS FOR THE ACTION

9. As a distributor, which is a company that "operat[es] a retail distribution system to provide electricity directly to retail customers,"[15] Dominion has the obligation under the Interconnection Statute "to connect any retail customer, *including those using distributed generation*, located within its service territory to those facilities of the distributor that are used for delivery of retail electric energy, subject to *Commission rules and regulations* and *approved tariff* provisions related to connection of service."[16]

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[12] Va. Code § 56-6.
[13] Va. Code § 56-35.
[14] Va. Code § 56-247.
[15] Va. Code § 56-576 (defining "distributor" as such term is used in the Virginia Electric Utility Regulation Act).
[16] Va. Code § 56-578, subsection A (emphasis added).

10. Dominion is required under the Interconnection Law "to provide distribution within its service territory on a basis that is just, reasonable, and not unduly discriminatory to suppliers of electric energy, *including distributed generation*, as *the Commission* may determine."[17] The Interconnection Statute has a caveat to this obligation, stating that it applies "except as otherwise provided in this chapter [the Virginia Electricity Utility Regulation Act]."[18] The Parameters never cite to an exception under the Virginia Electricity Utility Regulation Act as a justification for deviating from these statutory requirements. Instead, the Parameters state as follows:

> The interconnection parameters described in this Guide are based, as appliable, on Good Utility Practice, industry standards, the North Carolina Utilities Commission (NCUC) Interconnection Rules and Procedures Associated with Net Metering, and the Virginia State Corporation Commission's Regulations Governing Interconnection of Net Metering DERs, which define and establish standardized interconnection and operating requirements for the sale and reliable operation of the EPS [Electric Power System] and Net Metering DERs.[19]

11. Significantly, it is the Commission, and not Dominion nor the North Carolina Utilities Commission, that is required under the Interconnection Statute to "*establish interconnection standards* to ensure transmission and *distribution safety and reliability*, which standards shall not be inconsistent with nationally recognized standards *acceptable to the Commission.*"[20]

12. The Interconnection Law also requires that the Commission, when adopting interconnection standards, "to not make compliance *unduly burdensome and expensive*" and to "determine questions about the ability of *specific equipment* to meet interconnection standards."[21]

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[17] Va. Code § 56-578, subsection B (emphasis added).
[18] Va. Code § 56-578, subsection B.
[19] Exhibit A (Parameters) at page 6 of 35.
[20] Va. Code § 56-578, subsection C (emphasis added).
[21] Va. Code § 56-578, subsection C (emphasis added).

13. The Interconnection Rules, revised and approved most recently by the Commission by Orders dated July 29, 2020 and August 3, 2020, in SCC Docket No. PUR-2018-00107, "establish interconnection standards to ensure transmission and distribution safety and reliability" with goals of "seek[ing] to prevent barriers to new technology" and "not mak[ing] compliance unduly burdensome and expensive."[22]

14. Among other things, the Interconnection Rules establish and limit a customer's cost responsibility in connection with the interconnection of small generators:

> Neither the electric distribution company nor the energy service provider shall impose any charges upon a customer for any interconnection requirements specified by this chapter, except as provided under subdivisions A 5, A 6, and A 7 of this section, 20VAC5-315-50, and 20 VAC5-315-70 as related to additional metering.[23]

15. The Interconnection Rules also establish what constitutes good utility practice:

> "Good Utility Practice" means any of the practices, methods, and acts engaged in or approved by a significant portion of the electric industry during the relevant time period, or any of the practices, methods, and acts that, in the exercise of reasonable judgment in light of the facts known at the time the decision was made, could have been expected to accomplish the desired result at a reasonable cost, consistent with good business practices, reliability, safety, and expedition. *Good Utility Practice is not intended to be limited to the optimum practice, method, or act to the exclusion of all others, but rather to include practices, methods, or acts generally accepted in the region.*[24]

16. On May 24, 2022, the Commission established SCC Docket No. PUR-2022-00073 to "explore interconnection issues related to utility distributed energy resources ("DER")."[25] Through this docket, the Commission Staff collected comments on utility DER interconnection

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[22] *Ex Parte: In the matter of revising the Commission's Regulations Governing Interconnection of Small Electrical Generators*, Case No. PUR-2018-00107, Order Initiating Rulemaking Proceeding at 1 (Sept. 5, 2018) (quoting Va. Code § 56-578 C).

[23] 20 VAC5-315-40 (D).

[24] 20 VAC5-315-20.

[25] *Ex Parte: In the matter considering utility distributed energy resource interconnection-related issues and questions*, Case No. PUR-2022-00073, Order for Comment at 1 (May 24, 2022) (hereinafter the "May 2022 Interconnection for DER Order").

issues and, as of the date of this Petition, is scheduled to convene a work group by August 2023 to study issues related to interconnection costs including but not limited to substation improvements, cost transparency, and consider the imposition of Direct Transfer Trip (DTT) dark fiber on interconnection projects in light of their costs.[26]

17. On May 2, 2023, the Commission established SCC Docket No. PUR-2023-00069 to determine whether the Commission's Interconnection Rules should be revised.[27] This May 2023 Interconnection Rules Order directs the Commission's Staff to solicit comments from stakeholders and persons having an interest in the Interconnection Rules and the interconnection of small electrical generators and storage in the Commonwealth and, at a minimum, consider whether amendments to the Interconnection Rules are needed.[28]

18. By issuing the Parameters, Dominion has usurped the Commission's authority to establish interconnection standards that ensure distribution safety and reliability which are not inconsistent with nationally recognized standards acceptable to the Commission.[29] In doing so, Dominion has prematurely and unilaterally imposed costs and delays that are both unprecedented and substantial on members of VA-DSA and its Customer Generators that go well beyond those permitted under the Interconnection Rules and NEM Rules and that directly contradict the Commission's duty under the Interconnection Law to establish interconnection standards that are not "unduly burdensome and expensive" and to "determine questions about the ability of specific equipment to meet interconnection standards."[30] An immediate injunction is necessary to suspend

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[26] *Ex Parte: In the matter considering utility distributed energy resource interconnection-related issues and questions*, Case No. PUR-2022-00073, Order at 6 (March 3, 2023).
[27] *Ex Parte: In the matter of revising the Commission's Regulations Governing Interconnection of Small Electric Generators and Storage*, Case No. PUR-2023-00069, Order Initiating Rulemaking Proceedings at 1-2 (May 2, 2023) (hereinafter the "May 2023 Interconnection Rules Order").
[28] May 2023 Interconnection Rules Order at 2.
[29] Va. Code § 56-578, subsection C.
[30] Va. Code § 56-578, subsection C.

the imposition of the Parameters on Midsized NEM Projects until the Commission has an opportunity to decide whether the Commission's Interconnection Rules and NEM Rules should be revised in either the PUR-2022-00073 or PUR-2023-00069 dockets and to otherwise provide guidance regarding interconnection issues impacting Midsized NEM Projects.

19. By requiring that Customer Generators execute SGIAs, Dominion disrupts the duties and obligations established under PPAs that are entered into by Customer Generators pursuant to the PPA Law and also ignores the unique status of Customer Generators under the NEM Law and NEM Rules.

STATEMENT OF THE FACTS AND ARGUMENT

20. VA-DSA members and Customer Generators are actively engaged in behind-the-meter nonresidential net-metered projects across the Commonwealth, including in Dominion's service territory. These projects, which include Midsized NEM Projects, are subject to the Interconnection Rules and NEM Rules.

21. On December 20, 2022, Dominion issued the Parameters. A true and accurate copy of the Parameters is attached hereto as Exhibit A.

22. The Parameters establish that projects ranging from 250 kW up to 1 MW may be subject to requirements set forth in Exhibit C of the Parameters, including but not limited to substation upgrades, DTT dark fiber cable and distributed generation ("DG") relay panel equipment. Such requirements impose substantial new costs on solar developers yet are not required by the Interconnection Rules and NEM Rules, nor, prior to mid-2022, were they required by Dominion.[31] As estimated by Dominion in Appendix C of the Parameters, dark fiber costs

[31] *See* Exhibit L (Secure Futures May 2023 Letter) first paragraph (noting that Dominion interconnection costs substantially increased starting in early October of 2022); Exhibit O (Covert Solar May 2023 Letter) third paragraph (noting that its net metering experience changed drastically when the Parameters were implemented without warning late in 2022).

$150,000 to $250,000 per mile.[32] A DG relay panel costs $250,000 for the equipment plus an additional $200,000 to $1,200,000 for engineering, mobilization, and construction management.[33]

23. In many (if not most) cases, the costs and delays imposed by the Parameters make Midsized NEM Projects infeasible for the Customer Generators of VA-DSA members, including public schools, municipalities, and other public and private entities seeking to achieve their sustainability goals through solar energy. These substantial impacts are especially inappropriate given the sudden, unilateral and unprecedented imposition of the Parameters by Dominion, which has not been authorized by Virginia statute, Virginia regulation, or a Commission approved tariff.

24. For example, costs associated with upgrades required for multiple net-metering requests submitted over the course of the past approximately six months have been exorbitant relative to what the base cost of building such projects would have been under the existing Interconnection Rules and NEM Rules. This has resulted in estimates as high as 150% of the base project cost for substation, DTT, and fiber related material and labor costs. One solar developer member of VA-DSA was dismayed to learn, just before work was scheduled to start on a 710 kW solar array in April of 2023, that the project would have to bear $276,000 of upgrades on the Dominion side of the meter as well as up to $320,000 of estimated costs for 1.6 miles of dark fiber.[34]

25. New costs imposed by the Parameters were also crippling for a 686 kW solar array at the James River Juvenile Detention Center for Henrico County. Dominion estimates $2.25 million in preliminary costs, the majority of which are for running nine miles of fiber optic cable, plus there will be additional costs not yet specified. Henrico County is paying for this project, and

[32] Exhibit A at p. 35.
[33] Exhibit A at p. 35.
[34] Exhibit F (Tiger Solar May 2023 Letter).

Carrie Webster, its Energy Manager, observes: "The project cannot absorb these costs, so it is on hold indefinitely."[35]

26. Additionally, Prince William County Schools ("PWCS") has faced similar onerous additional costs in connection with its 987-kW solar rooftop array project for its Title I school, Freedom High School. A true and accurate copy of a letter from Jennifer Rokasky, Energy Education Coordinator with PWCS, is attached hereto as Exhibit K. As set forth in Ms. Rokasky's letter: "The unexpected, proposed interconnection charges of an estimated million dollars or more from Dominion, ... would impede an already tight budget with our school division. It is punitive and dissuades public entities from pursuing a Solar PPA, which can help save money on utility costs and work towards reducing greenhouse gas emissions to leave a more sustainable future for our students." As attached with the PWCS letter, on June 10, 2020, the PWCS School Board passed a Sustainability Initiative Resolution. One of the many items in this resolution includes the language: "Present the School Board with solar Power Purchasing Agreement (PPA) plans for all new construction, and retrofitting opportunities for older schools, where appropriate."

27. Secure Futures documents similar experiences with interconnection costs for Midsized NEM Projects in Dominion's service territory, observing the following regarding behind-the-meter, solar projects that are net metered and are 1 MW or less in Virginia:

> Until 2022, interconnection costs for such projects generally ranged from 0% to 2% of the total cost. Start in 2022, interconnection costs for such projects in Dominion's service territory have substantially increased from 20% to 40% or more of the total project costs.[36]

For a 995 kW community solar project in Augusta County, Dominion now requires "dark fiber for 4.5 miles plus substation improvements and reclosers, which adds an additional $1 million in

[35] Exhibit G (Henrico County May 2023 Email).
[36] Exhibit L (Secure Futures May 2023 Letter), first paragraph.

upgrades . . .resulting in interconnection costs being 40% of the total project cost."[37] These requirements are entirely "unprecedented prior to 2022."[38] Secure Futures describes a similar fate for the 987 kW rooftop solar project on Freedom High School for Prince William County Public Schools described by Ms. Rokasky above, where the total price tag for interconnection is expected to exceed $1 million, not including substation improvements, which represents about 35% of the total project cost.[39]

28. Convert Solar also experienced an unprecedented cost increase for its 902 kW solar Grand Mart project in Newport News, which added $376,000 to the total project costs that, when coupled with the unprecedented delays described below, "led to the cancellation of the project."[40] Chris Lee, the owner of the Grand Mart grocery store chain, is so frustrated by the extreme change in Dominion's net metering policies that he composed a letter entreating the Commission "to mandate the state utility companies to honor the rules in place for net metering."[41] Indeed, net metering rules played a role in locating his business in Virginia:

> When I chose to do business in Virginia, the process of installing solar panels and getting net metered was straight forward. Many of my business decisions were based on this fact, and I put solar panels on our Virginia Beach store without any problems.
>
> Last year, when I started the process of putting solar panels on my Newport News store, I expected the process to be as straightforward. My contractor filed the net metering interconnection agreement and contrary to the 60-day timeframe, we did not receive any information for over 6 months. When we finally did receive information, . . .pay[ing] Dominion an extra $370,000 . . .makes the project uneconomical and was not part of my business plan when I purchased the building. . . With Dominion's unexpected rule changes and costs, my business will suffer. In retrospect, I would have located my grocery store chain in another state with better net metering rules and where I could take advantage of the federal tax treatment for investing in solar.[42]

[37] Exhibit L (Secure Futures May 2023 Letter), third paragraph.
[38] Exhibit L (Secure Futures May 2023 Letter), eighth paragraph.
[39] Exhibit L (Secure Futures May 2023 Letter), sixth paragraph.
[40] Exhibit O (Convert Solar May 2023 Letter), first paragraph.
[41] Exhibit P (Grand Marth May 2023 Letter), fourth paragraph.
[42] Exhibit P (Grand Marth May 2023 Letter), first, second and third paragraphs.

29. Mr. Lee's experience illustrates that in addition to the magnitude of these new *costs* on Midsized NEM Projects, the regime under the Parameters also imposes substantial *delays* on projects. While the Parameters have been in place, Dominion has consistently exceeded the 60 day requirement under the NEM Law and NEM Rules for responding to Net Metering Interconnection Notification[43] ("NMIN") applications submitted by Customer Generators of the VA-DSA. For instance, a community college solar project has missed the most optimal window for proper planning and installation of the tie-in for its solar array due to the project, which was submitted in December 2022, being subject to a May 11, 2023 waiver request of the 60 day requirement.[44] In another instance, the PWCS NMIN application response was 109 days, with further studies "TBD months."[45] Covert Solar cites the 16 month delay for upgrades for its 902 kW solar installation at Grand Mart in Newport News as a factor that led to cancellation of the project.[46] Secure Futures observes that Dominion's unilaterally imposed technical requirements and costs, along with the delays and missed deadlines, imperil its projects and others across Virginia.[47] This has made it nearly impossible under the regime imposed by the Parameters starting in 2022 to develop Midsized NEM Projects and operate solar businesses in Dominion territory, in sharp contrast to the development of such projects prior to 2022.[48] Ultimately, Dominion's actions threaten an industry which employs thousands of engineers, electricians and construction workers

[43] Va. Code § 56-594.C; 20 VAC 5-315 (Net Metering Interconnection Notification (NMIN)).
[44] Exhibit F (Tiger Solar May 2023 Letter).
[45] Exhibit L (Secure Futures May 2023 Letter).
[46] Exhibit O (Convert Solar May 2023 Letter), first paragraph.
[47] Exhibit L (Secure Futures May 2023 Letter), eight paragraph.
[48] *See, e.g.* Exhibit L (Secure Futures May 2023 Letter), first paragraph (observing that in doing net metering projects since 2010 in Virginia, the magnitude of costs and delays associated with the Parameters is unprecedented); Exhibit O (Convert Solar May 2023 Letter), second paragraph (describing how, for the majority of its 10 year history, its experience with the net metering process has been a good one, with approvals received in an efficient manner and with sufficient feedback to create a work flow for the coming months).

who are ready to build solar projects to deliver clean, safe electricity to customers across the Commonwealth.[49]

30. The increased costs and substantial delays caused by the Parameters have been especially harmful to low-income, under-resourced, and vulnerable areas. Norfolk Solar LLC and Norfolk Solar Qualified Opportunity Zone Business have achieved success since 2019 in installing over $1 million of solar in low to moderate income neighborhoods under the Interconnection Rules and NEM Rules. Their business model involves working with their installer to hire and train new solar installers from these neighborhoods in order to ensure that the neighborhoods benefit not only from the solar energy and savings in electricity costs but also benefit from new job opportunities. Norfolk Solar works with investors to deploy their capital to Virginia to install solar on businesses and non-profits such as churches in vulnerable neighborhoods. But the pricing and timing uncertainty for commercial solar due to the Parameters means that Norfolk Solar's "business is at a stand-still." Norfolk Solar can no longer bring new investment dollars to Virginia, and the neighborhoods' benefits from solar installs and additional solar jobs have vanished. The timing of the Parameters is especially detrimental because it means Norfolk Solar cannot take advantage of "the influx of dollars in renewable energy due to the incentives of the Inflation Reduction Act."[50]

31. Similarly, Sun Spots LLC, which finances the installation of solar in low-income communities in the Hampton Roads area, "can no longer quote commercial jobs with assurance that they won't be delayed by studies, made more costly by new requirements and extra equipment,

[49] Exhibit O (Convert Solar May 2023 Letter), third paragraph (observing that Convert Solar's roster "has grown by 600% in the past three years" but it may be impossible "to grow at all" under the Parameters); Exhibit L (Secure Futures May 2023 Letter), eighth paragraph (noting that the Parameters "have made it nearly impossible to develop projects and operate businesses in Dominion's territory" which "threatens to imperil these projects and others across Virginia").

[50] Exhibit D (Norfolk Solar May 2023 Letter).

or simply languish in an approval queue for months on end" since the Parameters have been in place. This is especially frustrating because this small business owner "would really like to be maximizing my installs in low-income communities, because of the extra tax incentives for that in the Inflation Reduction Act."[51]

32. The Parameters are especially detrimental as well for rural schools and communities where Dominion's distributed grid is least developed, and the Customer Generators are most often least able to afford these costs. This is due in part to Dominion's "Light Load to Cumulative Generation Capacity" screen used to justify that "Transfer Trip is required [and that] Additional Transformer, Substation, and Transmission Upgrades will be provided in the Facility Study and System Impact Study."[52] The Light Load to Cumulative Generation Capacity = minimum 3:1 screen ratio and the 8 a.m. to 8 p.m. light load period are nowhere justified or even mentioned in its Parameters nor in Dominion's Blue Book[53] which is referenced in the Parameters. According to this logic, nowhere justified or explained in the unprecedented Parameters, rural areas with a lower light load during the hours from 8 a.m. to 8 p.m. have a lower load from existing customers and therefore presumably a less developed distribution infrastructure that cannot match up to the cumulative generation of one or more Midsized NEM Projects. To be consistent with the Interconnection Law and Interconnection Rules and NEM Rules, such requirements would not be unilaterally imposed by Dominion. Instead, such requirements would first be subject to Commission review, where they could evaluated and compared with other nationally recognized

[51] Exhibit E (Sun Spots LLC May 2023 Letter).
[52] Exhibit L (*See* Feasibility Report from Dominion, May 23, 2023, page 2, attached to Secure Futures May 2023 Letter). *See also* Exhibit F (Tiger Solar May 2023 Letter).
[53] *Information and Requirements for Electric Service*, 2023 Edition Blue Book, Dominion Energy Virginia Dominion Energy North Carolina. *See* https://www.dominionenergy.com/-/media/pdfs/north-carolina---electric/large-business/blue-book.pdf?la=en&rev=4b6d05fe8673435c91d0f7f0b96d6048.

expertise on "Light Load to Cumulative Generation Capacity" as published by Sandia Labs[54] and/or the National Renewable Energy Labs.[55] As with the Parameters, the VA-DSA is not asking that the Commission rule in this docket on the technical merits of Dominion's Light Load to Cumulative Generation Capacity screen. Rather, the VA-DSA emphasizes how this new screen imposed by Dominion in 2022 may create greater harm for rural communities. This further emphasizes the need for compliance with the Interconnection Law and Interconnections Rules that do not permit Dominion to unilaterally impose such a requirement. The possible imposition of this new screen ought to be part of the Commission's ongoing investigation and rulemaking addressing interconnection issues in Commission Docket Nos. PUR-2022-00073 and PUR-2023-00069, and in the meantime, the screen as well as the Parameters for Smaller Interconnection Project should be immediately suspended.

33. Yet another barrier newly imposed by Dominion on Midsized NEM Projects concerns the impact on solar PPAs of Dominion's requirement that the end-use net metering Customer Generator for Midsized NEM Projects execute a Small Generator Interconnection Agreement (SGIA).[56] Repeatedly and with different Customer Generators,[57] Dominion is responding to NMIN applications by improperly categorizing what is a net-metered Customer Generator under the NEM Rules as being an "Interconnection Customer" and then requiring that

[54] Ropp, M., Ellis, A., "Suggested Guidelines for Assessment of DG Unintentional Islanding Risk", Sandia Report – SAND2012-1365, March 2013 Revision, https://energy.sandia.gov/wp-content/gallery/uploads/SAND2012-1365-v2.pdf (last visited May 31, 2023). See page 8 where the report suggests a more moderate 3:2 ratio for daylight hours starting at 10 a.m.

[55] Hoke, A., Nelson, A., Miller, B., Chakraborty, S., Bell, F., McCarty, M., "Experimental Evaluation of PV Inverter Anti- Islanding with Grid Support Functions in Multi-Inverter Island Scenarios", NREL Report NREL/TP-5D00-66732, July 2016 See also https://www.nrel.gov/docs/fy16osti/66732.pdf (last visited May 31, 2023). Based on real-time studies of operating distributed generation facilities on the same distribution feeder, it was found that the inverters complied with all the necessary safety and reliability standards under IEEE-1547 without requiring any additional controls.

[56] Exhibit H (Small Generator Interconnection Agreement).

[57] *See* Exhibit F and Exhibit L(Dominion feasibility reports are included with Tiger Solar May 2023 Letter and with Secure Futures May 2023 Letter).

same Customer Generator enter into an SGIA. Through these actions, Dominion fails to conform to the NEM Rules for Small Interconnection Customers and to the PPA Law. This SGIA requirement is entirely inconsistent with Dominion's prior practices. Before 2022, Dominion did not require that on-going O&M costs be carried by the Customer Generator under an SGIA for an indefinite period of time and subject to cost increases. For many customers, this newly imposed SGIA requirement violates the principle benefit of entering into a solar PPA pursuant to the PPA Law. The Customer Generator's solar PPA does not impose capital or on-going costs on the Customer Generator, and a number of VA-DSA members have found that their Customer Generators are balking at Dominion's insistence that they sign an SGIA. For example, Prince William County Public Schools (PWCS)[58] finds Articles 1 and 2 of the SGIA[59] especially concerning because the entire point of utilizing a solar PPA contract for financing its solar arrays was to place all the burden of operation and maintenance *on the solar PPA provider* (as occurs with a PPA between the Customer Generator and the solar PPA provider) rather than imposing such costs on the *public school system* (as occurs with an SGIA between the Customer Generator and Dominion). PWCS not only finds the SGIA "unacceptable" but finds that it is "punitive and dissuades public entities from pursuing a Solar PPA."[60] Convert Solar also reports that it has "received strong pushback from some of our customers regarding [the SGIA] as it renders them liable for the construction, operation, and maintenance of the system" which customers view as "a risky decision."[61] Dominion's actions to require an SGIA undercut and effectively void the allocation of duties and obligations set forth in solar PPAs. Dominion is well aware of the

[58] *See* Exhibit K (PWCS May 2023 Letter).
[59] See Exhibit H (SGIA template).
[60] Exhibit K (PWCS May 2023 Letter).
[61] Exhibit O (Convert Solar May 2023 Letter), second paragraph.

existence of the solar PPAs because the solar PPAs are not only registered with the Commission,[62] but they are also stipulated in the Net-Metering Interconnection Notification ("NMIN") form required by Dominion to apply for net-metering approval.[63] Coercing Customer Generators to execute an SGIA entirely undermines how the duties and obligations are allocated in existing solar PPAs between the Customer Generator and its solar provider, essentially rendering the PPA Law ineffective. Accordingly, the VA-DSA seeks to have the Commission enjoin Dominion from acting in an unlawful manner by requiring execution of SGIAs for Customer Generators submitting NMIN applications for net-metering of Midsized NEM Projects.

34. By its April 25, 2023 letter to Mr. Robert Blue, President and Chief Executive Officer of Dominion, VA-DSA discussed the detrimental impact of Dominion's unilateral and premature imposition of the Parameters. A true and accurate copy of VA-DSA's April 25, 2023 letter is attached hereto as Exhibit B. As part of that letter, VA-DSA also noted that the Parameters impede Dominion's "ability to meet Dominion's Renewable Portfolio Standards more affordably under VCEA for projects up to 1 MW (AC) per VA Code 56-585(C), *Generation of electricity from renewable and zero carbon sources*."

35. VA-DSA, on behalf of its members and Customer Generators, requested that Dominion suspend its imposition of the Parameters on Midsized NEM Projects until the issues raised in the Commission's Docket No. PUR-2022-00073 are resolved.[64]

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[62] See "Notice of Intent for Third Party Power Purchase Agreement / DEV Renewable Energy Pilot Program PPA Notice Information" filed on 2023-02-15 — see online registration at https://www.scc.virginia.gov/getattachment/fb2df7b3-e690-40cc-a839-02ebce90329e/dev_ppanotc.pdf.

[63] *See* Exhibit L (Secure Futures May 2023 Letter) which includes the NMIN application that on page 1, Section 2 asks for "Generator Information: Owner and/or Operator Name (if different from Applicant)" for Freedom High Schools submitted by Secure Futures under its wholly owned subsidiary PW Solar LLC.

[64] Subsequent to VA-DSC's April 25, 2023 letter, the Commission issued the May 2023 Interconnection Rules Order and established another proceeding by which the Commission may properly evaluate and enact amendments to the Interconnection Rules.

36. On May 4, 2023, Dominion, through Mr. Nathan Frost, Director of New Technology and Energy Conservation, denied VA-DSA's request. A true and accurate copy of Dominion's May 4, 2023 response letter is attached hereto as Exhibit C. In its letter, Dominion ignored the fact that the Parameters are imposed on net-metered DER projects without Commission approval or that the costs imposed by these new requirements were financially crippling the solar development industry in Dominion's service territory. Instead, Dominion argued only that these new interconnection requirements, such as DTT dark fiber "is needed to maintain safe and reliable grid operation once the solar project is operational."

37. While eligible Customer Generators, as that term is defined by the Interconnection Rules, "shall bear all *reasonable costs* of equipment *required for the interconnection* to the supplier's electric distribution system,"[65] the costs associated with DTT dark fiber and DG relay panels, imposed by the Parameters, are neither reasonable nor necessary for the interconnection to Dominion's distribution system.

38. To date, the Commission has never found that substation improvements, DTT dark fiber and/or DG relay panels are (a) required for interconnection by Midsized NEM Projects or (b) impose reasonable costs on Midsized NEM Projects. Nor has the Commission ruled on imposing on-going O&M costs by requiring the Customer Generator to sign an indefinite service agreement under an SGIA in contravention to an existing solar PPA between the Customer Generator and solar provider for monthly O&M costs on net metering projects. Indeed, prior to 2022, Dominion never found these requirements to be necessary, either. While the Commission is currently assessing the costs and benefits associated with new interconnections costs such as substation improvements and DTT dark fiber in Docket No. PUR-2022-00073, no finding has been made yet

[65] *See* 20VAC5-315-70 (emphasis added).

by the working group convened pursuant to the May 2022 Interconnection for DER Order. In fact, in Staff's Report dated September 19, 2022[66] in that docket, Staff recognized:

> The requirement for usage of dark fiber-optic cable for DTT implementation was one of the most pressing issues commented on by the parties. According to CHESSA/CCSA and Secure Futures, Dominion's requirement to install DTT equipment is the most significant cost driver for projects seeking to interconnect to its distribution system. Depending on whether the existing distribution structures can directly support fiber or require upgrades, dark fiber deployment costs vary significantly.
>
> . . .
>
> Staff believes that this topic and associated alternatives warrant further discussion beyond the instant proceeding. Staff recognizes the possibility of using alternatives to fiber-optic cables for DTT. . . However, Staff agrees . . . that a technical working group may be required to discuss potential alternatives to DTT, including cellular communications, the implementation of IEEE 1547 certified inverters, and other possible alternatives. [67]

39. Moreover, upon information and belief, neither Appalachian Power Company ("APCo") nor any electric cooperative in the Commonwealth of Virginia imposes substation improvements or DTT dark fiber cable and DG relay panels on Midsized NEM Projects in their service territories. For example, Secure Futures states that

> We are currently developing comparably sized commercial-scale solar projects in the territories of other Virginia electric cooperatives, APCo, [and] ODP, and have not experienced anything even closely resembling the delays, costs, and technical challenges of the Dominion interconnection parameters.[68]

And some members of the VA-DSA are aware of instances where Dominion has not consistently applied the Parameters. In one instance, for a large Virginia commercial customer that executed a solar PPA with Secure Futures, Dominion reversed itself in requiring substation improvements and dark fiber after the customer appealed the exorbitant costs directly to Bob Blue, CEO of

[66] Dominion has been imposing DTT dark fiber requirements for projects *in front of the meter* prior to September 2022; it was only in late 2022 that Dominion began imposing this requirement on *behind-the-meter* projects.
[67] *Ex Parte: In the matter considering utility distributed energy resource interconnection-related issues and questions*, Case No. PUR-2022-00073, Staff Report of Division of Public Utility Regulation at 14 (Sept. 19, 2022).
[68] Exhibit L (Secure Futures May 2023 Letter) at 3.

Dominion. Dominion's response explained the change due to the fact that the project had been down-sized from 1 MW (AC) to 975 KW (AC).[69] It defies logic that Dominion's reliability and safety concerns were legitimate for a 1 MW project and then vanished for a 975 kW project. Consequently, the Parameters are not consistently applied by Dominion and are inconsistent with the widely accepted utility practices through the Commonwealth, and to the knowledge of VA-DSA members, throughout the PJM region.[70] This indicates that it is an open question whether the Parameters are consistent with Good Utility Practice under the Interconnection Regulations, which consist of

> practices . . . engaged in or approved by a *significant portion of the electric industry* during the relevant time period . . . that, in the exercise of reasonable judgment . . . could have been expected to *accomplish the desired result at a reasonable costs*, consistent with good business practice, reliability, safety, and expedition.[71]

It is important to keep in mind that Good Utility Practice "is not intended to be limited to the *optimum* practice, method, or act to the exclusion of all others, but rather to include practices, methods, or acts *generally accepted* in the region."[72] Dominion has simply not borne its burden of proof that the Parameters are consistent with Good Utility Practice, despite its assertion in the Parameters.[73]

40. Members of the VA-DSA value the positive and productive working relationships they have forged with various and many individual Dominion personnel in their administration of the existing Interconnection Regulations and existing NEM Rules. For example, Convert Solar observes as follows:

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[69] *See* Exhibit L (Secure Futures May 2023 Letter), second paragraph.
[70] PJM is a regional transmission organization (RTO) that coordinates the movement of wholesale electricity in all or parts of 13 states and the District of Columbia, including Virginia. *See Territory Served*, PJM, https://www.pjm.com/about-pjm/who-we-are/territory-served (last visited May 31, 2023).
[71] 20 VAC 5-314-20 (emphasis added).
[72] 20 VAC 5-314-20 (emphasis added).
[73] Exhibit A (Parameters) at page 6 of 35.

> Throughout the majority of Convert Solar's 10-year history, our experience with the net metering process has been a good one. Approvals were received in an efficient manner and feedback regarding the projects was sufficient enough to create a plan for our workflow in the coming months.[74]

Moreover, members of the VA-DSA appreciate Dominion's responsibility for keeping the grid safe and reliable for all those who depend upon the grid. However, Dominion's recent, unprecedented and unilateral attempt to substantially change how interconnection is done for Midsized NEM Projects, on the mere assertion of reliability and safety concerns, is "unjust, unreasonable . . . unjustly discriminatory" and "otherwise in violation of law," which, under Va. Code § 56-247, empowers the Commission to "make orders respecting changes in such practices and acts as shall be just and reasonable." Given the immediate and substantial harm created by the Parameters and other recent Dominion practices described above on Midsized NEM Projects, on Customer Generators, on the Virginia solar industry and on all those employed by the solar industry in the Commonwealth, and given the Commission's current investigation of the use of substation improvements, DTT and dark fiber for interconnection, the Commission should act expeditiously to direct Dominion to suspend the Parameters and other recent Dominion practices described above for Midsized NEM Projects pending the outcome of the Commission's investigation.

41. The VA-DSA is not seeking in this Petition to have the Commission ultimately determine whether imposing costs such as substation upgrades, DTT dark fiber cable, and DG relay panel equipment is or is not appropriate for certain interconnection projects. Rather, the VA-DSA is asking the Commission to expeditiously suspend the Parameters for Midsized NEM Projects based on their highly detrimental impact and based on the lack of any Commission finding that the immediate imposition of the Parameters is needed for safety and reliability purposes or is

[74] Exhibit O (Convert Solar May 2023 Letter), third paragraph.

consistent with Good Utility Practice. In addition, the Commission should suspend Dominion's requirement that Customer Generators execute SGIAs for Midsized NEM Projects, which contravenes existing solar PPAs between a Customer Generator and its solar provider. Also, the Commission should suspend Dominion from using the "Light Load to Cumulative Generation Capacity" screen to justify Transfer Trip dark fiber and additional transformer, substation, and transmission upgrades, which impose particular hardships on rural communities. Such suspensions should continue at least until the Commission has completed its investigations in Commission Docket Nos. PUR-2022-00073 and PUR-2023-00069, where it would be appropriate for the Commission to consider distinctions between what requirements are appropriate for Midsized NEM Projects, as compared to larger behind-the-meter projects greater than one megawatt and as compared to interconnection projects in front of the meter. Creating a separate interconnection class for Midsized NEM Projects would be consistent with existing legislation encouraging Dominion to increase its Renewable Energy Portfolio for net metered projects up to and including one megawatt.[75]

42. Expeditious suspension would avoid causing immediate and substantial harm to VA DSA members and Customer Generators, and would also avoid harm to several key objectives. First, meeting Virginia's carbon reduction goals.[76] Second, reducing taxpayers' expenditures on electricity.[77] Third, obtaining Virginia's fair share of IRA taxpayer dollars.[78] Fourth, enabling

[75] *See* Va. Code § 56-585(C), *Generation of electricity from renewable and zero carbon sources.*
[76] Exhibit I (Sierra Club May 2023 Letter) describes the "major climate benefits offered by clean renewable energy" and quotes the Commonwealth Clean Energy Policy, codified at Va. Code § 45.2-1706.1.
[77] Exhibit I (Sierra Club May 2023 Letter) describes "the opportunity for customers . . .to save money and lock in the price of electricity; Exhibit N (Faith Alliance May 2023 Letter) describes how the Parameters "undermine the cost-effectiveness of the projects."
[78] Exhibit D (Norfolk Solar May 2023 Letter) noting how the timing of the Parameters is especially determinantal because it means Norfolk Solar cannot take advantage "of the influx of dollars in renewable energy due to the incentives of the Inflation Reduction Act."

public entities and private businesses to meet their sustainability goals.[79] Fifth, ensuring that Virginia enjoys the economic benefits of solar development, including attracting major businesses and boosting the local economic development and job creation.[80] Sixth, discontinuing Dominion's imposition of SGIAs on Customer Generators, which undermines and is inconsistent with solar PPAs authorized by the PPA Law. Seventh, enabling a wide range of Virginians to benefit from clean, locally produced energy in their communities.[81] And without this suspension, the ongoing, multi-month effort that the Virginia Department of Energy is leading on identifying and solving gaps in solar workforce training may prove fruitless if the Parameters continue to impose barriers that decrease the amount of new solar installations.[82] Failing to suspend the Parameters would also undermine the Virginia Department of Energy's ongoing efforts to develop its application to the *EPA Greenhouse Gas Reduction Fund Solar for All* program competition, which will open in the summer of 2023 and represents a $7 billion national opportunity.[83]

43. An injunction against Dominion would be consistent with Commission precedent. The Commission has previously enjoined Shenandoah Valley Electric Cooperative ("SVEC") from similarly unilaterally imposing costs related to interconnection that had not been approved by the Commission through the Interconnection Rules or a Commission-approved tariff.[84] In that

[79] Exhibit N (Faith Alliance May 2023 Letter) describing its role in solar adoption by churches, synagogues, temples, and mosques.

[80] Exhibit P (Grand Mart May 2023 Letter) The owner of the Grand Mart grocery store chain states as follows due to the impediments imposed by the Parameters being so onerous compared to Dominion net metering prior to 2022: "In retrospect, I would have located my grocery store chain in another state with better net metering rules and where I could take advantage of the federal tax treatment for investing in solar." *See also* Exhibit L (Secure Futures May 2023 Letter), "Dominion's actions threaten an industry which employs thousands of engineers, electricians and construction workers who are ready to build projects to deliver clean, safe electricity to customers across the Commonwealth."

[81] *See* Exhibit M (VA-SUN May 2023 Letter).

[82] 2023 Virginia Residential Solar and Energy Efficiency Workforce Gap Analysis, https://building-performance.org/virginia-may-2023-state-update/.

[83] Exhibit J, Virginia Department of Energy Notice Regarding Public Comment Opportunity.

[84] *See Petition of Dogwood Solar, LLC for injunctive relief against Shenandoah Valley Electric Cooperative*, Case No. PUR-2020-00154, Final Order at 8 (Oct. 26, 2020) ("Dogwood Solar Order").

proceeding, the Commission found that the tariff provision relied upon by SVEC for the Operation and Maintenance ("O&M") charge it imposed on the petitioner, Dogwood Solar, was inapplicable and "SVEC has identified no tariff or regulation that currently permits such charge."[85] The Commission clarified that its "ruling, however, does not preclude SVEC from assessing a specific O&M charge in the future on Dogwood Solar, or any other facility, under a tariff or regulation approved pursuant to Commission Order.[86]

44. Similarly, here, VA-DSA is requesting the Commission to enjoin Dominion from prematurely and unilaterally imposing its Parameters on Midsized NEM Projects, until, and only if, the Commission amends the Interconnection Rules and NEM Rules to impose such requirements through orders in its active interconnection dockets, PUR-2022-00073 and PUR-2023-00069.

45. As set forth above, without the requested injunctive relief, VA-DSA and its members will continue to endure irreparable harm. There is no remedy at law adequate to compensate for the harm suffered by VA-DSA members and their Customer Generators.[87]

REQUEST FOR EXPEDITED TREATMENT

46. VA-DSA members are actively pursuing Midsized NEM Projects in Dominion's service territory.[88] The ongoing and substantial harm to these projects, and to the development of behind-the-meter solar energy generation generally, imposed by Dominion's Parameters and

[85] Dogwood Solar Order at 8.
[86] Dogwood Solar Order at 8.
[87] *See, e.g.* Exhibit N (Faith Alliance May 2023 Letter) at 2, observing as follows: "And these private projects, if derailed now due to these additional costs, are unlikely to be resurrected if the State Corporation Commission were to later reject Dominion's dark fiber requirements. . . .The decision to go forward with solar is influenced by the immediate need for repair or replacement of existing energy equipment, by the timing of roof repair or replacement, and the availability of funds. Delaying a solar project often means the window of opportunity to install solar, closes."
[88] *See* Exhibit B, Attachment A (listing representative sample of 2022-2023 projects); Exhibit D (discussing Norfolk Solar experience); Exhibit E (discussing Sun Spots experience); Exhibit F (discussing Tiger Solar experience); Exhibit L (discussing Secure Futures experience); and Exhibit O (discussing Convert Solar experience).

recent practices described above exists and continues each day. Additionally, while the Commission continues to consider interconnection issues in Docket Nos. PUR-2022-00073 and PUR-2023-00069, including whether the Schedule C facilities costs such as substation improvements and DTT dark fiber cable are reasonable and necessary for interconnection projects, final orders in either Commission proceeding will likely not be issued anytime in the near future. Accordingly, expedited treatment is necessary to enjoin immediate and future harm.

CONCLUSION

For the foregoing reasons, the VA-DSA requests that the Commission issue an injunction that suspends the imposition of the Parameters on Midsized NEM Projects and suspends the requirement of SGIAs for Midsized NEM Projects at least until the Commission has completed its investigations and rulemaking in Docket Nos. PUR-2022-00073 and PUR-2023-00069 and has ruled definitely on such issues.

Respectfully submitted,

VIRGINIA DISTRIBUTED SOLAR ALLIANCE

June 1, 2023

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CERTIFICATE OF SERVICE

I hereby certify that a true and complete copy of the *Complaint and Petition for Injunctive Relief* was hand-delivered, emailed, and/or mailed, first-class postage prepaid, this 1st day of June 2023, to each person listed below.

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List of Exhibits

Exhibit A	Dominion Parameters
Exhibit B	Virginia Distributed Solar Alliance April 25, 2023 Letter to Dominion
Exhibit C	Dominion May 4, 2023 Letter to Virginia Distributed Solar Alliance
Exhibit D	Norfolk Solar May 2023 Letter
Exhibit E	Sun Spots May 2023 Letter
Exhibit F	Tiger Solar May 2023 Letter
Exhibit G	Henrico County May 2023 Email
Exhibit H	Small Generator Interconnection Agreement
Exhibit I	Sierra Club May 2023 Letter
Exhibit J	Virginia Department of Energy Communication Regarding DOE EPA Notice
Exhibit K	Prince William County Schools May 2023 Letter
Exhibit L	Secure Futures May 2023 Letter
Exhibit M	VA-SUN May 2023 Letter
Exhibit N	Faith Alliance for Climate Solutions May 2023 Letter
Exhibit O	Convert Solar May 2023 Letter
Exhibit P	Grand Mart May 2023 Letter

Exhibit A

Dominion Energy

Interconnection Parameters for Net Metering Distributed Energy Resources

December 20, 2022

Dominion Energy Virginia / North Carolina

Interconnection Parameters for Net Metering Distributed Energy Resources

Contributing Group(s)	Name(s) and Title(s)
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1 Scope

The scope of the Net Metering Interconnection Parameters for Distributed Energy Resources Guide (Guide) is to provide technical background and guidance concerning the interconnection of Net Metering Distributed Energy Resources (DER) for the primary purpose of offsetting customer energy usage with the energy generated with renewable resources based DER system. With Net Metering DERs,[1] it is expected that some amount of energy may flow onto Dominion Energy Virginia / North Carolina's electric distribution system, referred to in this guide as the Electric Power System (EPS), during light loading conditions. This guide provides a high level overview of the interconnection study parameters to form the basis of the engineering review of Net Metering DERs.

The interconnection parameters described in the Guide are based, as applicable, on Good Utility Practice, industry standards, the North Carolina Utilities Commission (NCUC) Interconnection Rules and Procedures associated with Net Metering, and the Virginia State Corporation Commission's Regulations Governing Interconnection of Net Metering DERs, which define and establish standardized interconnection and operating requirements for the safe and reliable operation of the EPS and Net Metering DERs.

Any output capacity discussed in this Guide will be stated as kW or MW.

Estimated costs for typical Net Metering DER upgrades are attached as Appendix C.

1.1 Disclaimer:

The information contained within this Guide, including any standards, guidelines, criteria, or requirements referenced therein or included in the Appendices, is intended to be used for information purposes only, is provided "as is" without representation or warranty of any kind, expressed or implied, and is subject to change. If there are any future changes to the requirements in this Guide, Dominion Energy will consider retaining the parameters utilized to identify Interconnection Requirements for all Net Metering DER interconnection requests for which a Study Agreement has been executed by the time of the change. For any Net Metering DER interconnection requests in the queue for which a Study Agreement has not been executed by the time of the change to the Guide, any updated requirements for interconnection would apply.

Dominion Energy is not responsible for the user's reliance on this Guide, or for any erroneous or misleading material. Dominion Energy may revise or withdraw this Guide at any time at its discretion without notice. It is the user's responsibility to ensure that it complies with all of Dominion Energy's current interconnection and operating requirements. To the extent that the information in this Guide is

[1] In this Guide, the term "Net Metering DERs" is used synonymously with "Generating Facility" or "Generator" as those terms are defined in 20 VAC 5-315-20.

inconsistent with the Dominion Energy tariffs or agreements, the Dominion Energy tariffs or agreements, as applicable, shall control. Finally, this Guide is non-binding and confers no rights.

2 Net Metering DER Study (Review) Parameters

Dominion Energy's Net Metering DER General Study Parameters are applicable to Net Metering DERs 3 MW and below and may consist of an in-depth review by Dominion Energy's engineering team based on the size. The in-depth review is preceded by a Net Metering review (screening) performed for all Net Metering DER applications immediately following submittal of the application and is based on the conditions of interconnection, as defined in Chapter 315. Regulations Governing Net Energy Metering - 20VAC5-315-40, and any other requirements as specified in Dominion Energy's **Blue Book**. When it is determined that in-depth review is required, a preliminary (Scoping) review will be conducted by the engineering team. The goal of the Preliminary (Scoping) review is to provide prospective Net Metering DER customers sufficient information early in the interconnection study process to help Net Metering DER customers decide whether to pursue the proposed Net Metering DER interconnection. Information resulting from the Preliminary Review phase includes the potential impact the proposed interconnection may have on distribution substation transformer capacity and distribution circuit capacity. Potential distribution and substation facilities upgrades needed are also discussed. Finally, with Net Metering DERs, it is expected that the customer's annual consumption will offset most of the total amount of generation indicated in the Net Metering DER application. The customer's minimum (light) load will be considered during the preliminary (scoping) review conducted by the engineering team, if available, when determining the applicable study (review) parameters as outlined below. Furthermore, given the export capability of Net Metering DERs, any distribution operating device located upline from Net Metering DER 1,000 kW and above will typically be required to have 3 phase tripping / operating capability, which may involve some equipment upgrade or replacement.

The DER General Study Parameter sections in this Guide provide a detailed description of the following:

- Dominion Energy's Net Metering DER Interconnection Study (review) process for 250 kW and below. (see section 2.2)
- Dominion Energy's Net Metering DER Interconnection Study (review) process in general for 250 kW and above but less than 1,000 kW. (see section 2.3)
- Dominion Energy's Net Metering DER Interconnection Study process in general for 1,000 kW and above but less than or equal to 3,000 kW. (see section 2.4)
- Net Metering DER Interconnection Study Parameters in general and the applicability of IEEE Std. 1547-2018 requirements and certification to UL 1741 Edition 3 (see section 2.5)

- Dominion Energy's approach to Net Metering DER grid support and ride-through capabilities (see section 2.5.1.1 and 2.5.1.2 respectively)
- Net Metering DER Impact limitations in general and the criteria that guide them, such as Power Quality Requirements, Rapid Voltage Change (RVC), Transformer Inrush requirements, and Harmonics. This section also discusses Transformer and circuit loading limitations and other criteria applicable to Net Metering DER Interconnections. (see sections 2.6.1, 2.6.2, 2.6.3 and associated subsections)
- Equipment reviews performed throughout the DER study process (see section 2.6.4)

The Net Metering DER General Interconnection Parameters section in this Guide provides a detailed description of the physical interconnection of the Net Metering DER with Dominion Energy's EPS. The section focuses on the POI and associated attachment facilities, and includes the following:

- Dominion Energy's DER Interconnection Generator Step-up Transformer Requirements (see section 3.1)
- Interconnection parameters for Net Metering DER for 250 kW and below. (see section 3.2)
- Interconnection parameters for Net Metering DER 250 kW and above but less than 1,000 kW (see section 3.3)
- Interconnection parameters for Net Metering DER 1,000 kW and above but less than or equal to 3,000 kW (see section 3.4)

2.1 The Net Metering DER Study (Review) Generally

Any DER that will operate in parallel with the EPS is required to meet applicable standards for interconnection and be certified to applicable testing standard(s). These standards include, but are not limited to, IEEE Std. 1547 and UL 1741 standard. Section 6 of this Guide includes a non-exhaustive list of applicable guides, codes and standards, state jurisdictional rules, and procedures applicable to the interconnection of DER.

For any DER connecting to Dominion Energy's EPS, regardless of its technology, the determination of whether the DER can safely and reliably operate in parallel with the EPS depends on several criteria applied at different phases of the DER interconnection review and studies. These include the impact of DER on transformer and circuit loading and/or capacity, on conductor thermal rating, on voltage profile or power quality, on protective device coordination, and other criteria as described in the sections 2.2 through 2.7 (including subsections) below.

In the preliminary review phase of Net Metering DERs of size 1,000 kW and above, but less than or equal to 3,000 kW, the loading limit associated with a generator interconnection will be determined in the preliminary review. The loading limit is dependent upon the size of the DER, the rating and capability of the applicable distribution facilities, and associated control equipment. Applicable distribution facilities

include but are not limited to the following devices: substation transformer, load tap changer, circuit conductor, substation and/or line regulator(s), distribution pole/pad-mounted transformer(s), breaker(s), line recloser(s), and fuse(s). Please refer to sections 2.7.2 and 2.7.3 for additional information on loading limit calculation.

During the study phase of Net Metering DERs of size 1,000 kW and above, but less than or equal to 3,000 kW, Dominion Energy performs voltage studies on all proposed DER sites using a power systems simulation platform called Synergi Electric. Existing circuit models for Dominion Energy's EPS are used and the proposed DER sites are added to the model. Power flow studies are performed, and the DER power output is varied from full output to no output to evaluate the worst-case voltage flicker. All proposed DER interconnections are currently studied at a fixed power factor, typically unity (1.0 PF), which is considered the base-case scenario for all DER regardless of the technology and/or the reactive or voltage support capability.

The sections below provide additional guidance on the general parameters considered by Dominion Energy during the Net Metering DER interconnection study (review) process. While the below sections provide guidance on the parameters that have the most impact on the outcome of the study process, they do not constitute an exhaustive list of all applicable study parameters.

2.2 Net Metering DER <250 kW Study (review) process.

For Net Metering DER < 250 kW, Dominion Energy does not perform voltage studies on the proposed DER sites. However, the Net Metering DER will need to satisfy the eligibility criteria as described in the State of Virginia Chapter 315, Regulations Governing Net Energy Metering, Condition of interconnection (20VAC5-315-40) and any applicable requirements. Additional requirements for interconnection for sites <250kW can be found in Dominion Energy's **Blue Book**, under the Customer Generation section.

Please note that if the 250 kW threshold of total DER on a Distribution line section is reached or exceeded due to **existing or aggregate generation**, the interconnection may be subject to other requirements typically applicable to Net Metering DERs ≥ 250 kW and < 1,000 kW or Net Metering DER ≥1,000 kW and ≤3,000 kW. See Section 2.3 or 2.4 below for more information.

2.3 Net Metering DER ≥ 250 kW and < 1,000 kW Study (review) process.

For Net Metering DER ≥ 250 kW and < 1,000 kW, Dominion Energy does not perform voltage studies on the proposed DER sites. However, the Net Metering DER will need to satisfy the eligibility criteria as described in the State of Virginia Chapter 315 - Regulations Governing Net Energy Metering - Condition of interconnection (20VAC5-315-40), and any applicable requirements. Furthermore, a Net Metering DER ≥ 250 kW and < 1,000 kW, is considered as a significant size that can impact Safety and Reliability of the

Power System, including protection. As a result, the associated **load-to-generation ratio** will be reviewed to determine if any other system protection upgrades are needed. Load-to-generation ratio is defined as the ratio between the day-time light load and the total aggregate generation on the distribution line segment. Additional information on requirements for interconnection can be found in Dominion Energy's Blue Book, under the Customer Generation section.

Please note that if the 1,000 kW threshold of total DER on a Distribution line section is reached or exceeded due to existing or aggregate generation, the interconnection may be subject to other requirements typically applicable to Net Metering DER ≥1,000 kW and ≤3,000 kW. See section 2.4 below for more information.

2.4 Net Metering DER ≥1,000 kW and ≤3,000 kW Study process.

For Net Metering DER ≥1,000 kW and ≤3,000 kW, Dominion Energy performs voltage studies on all proposed DER sites using a power systems simulation platform called Synergi Electric. Existing circuit models for Dominion Energy's EPS are used and the proposed DER site are added to the model. Power flow studies are performed, and the DER power output is varied from full output to no output to evaluate the worst-case voltage flicker. All proposed DER interconnections are currently studied at a fixed power factor, typically unity (1.0 PF), which is considered the base-case scenario for all DER regardless of the technology and/or the reactive or voltage support capability. Furthermore, a Net Metering DER ≥1,000 kW and ≤3,000 kW is considered as a significant size that can impact Safety and Reliability of the Power System, including protection. As a result, the associated load-to-generation ratio will be reviewed to determine if any other system protection upgrades are needed. Load-to-generation ratio is defined as the ratio between the day-time light load and the total aggregate generation on the distribution line segment. Additional information on power quality, transformer inrush, Rapid Voltage Change (RVC) and harmonics requirements are provided in the subsections below.

2.5 Net Metering DER's Energy Storage System (ESS) Review Parameters.

This Section 2.5 provides interconnection review parameters for Energy Storage Systems (ESS) used in conjunction with Net Metering.

An Energy Storage System is considered as a particular type of DER that has the ability not only to store energy from the EPS but also to inject its stored energy into the EPS. This makes it both a load and a generation source. Any energy storage used in conjunction with Net Metering, must be installed in such a way that prevents charging from the grid or discharging to the grid.

2.5.1 Loading and Discharging Restrictions

When the ESS is utilized in a Net Metering DER system, it is required per the Net Metering Interconnection rules and procedures not to charge using the Dominion Energy's EPS or back-feed into the EPS. Back-feeding into the EPS may be allowed if ESS is solely charged from the PV.

If the ESS owner / operator desires to utilize the ESS as both a load (importing power from Dominion Energy's EPS) and a generator (back-feeding or exporting into Dominion Energy's EPS), this may impact eligibility under the Chapter 315 terms and conditions, and may implicate Chapter 314 of the regulations.

2.5.2 ESS Parameters Review

All ESS project customers are required to provide a set of relevant ESS study parameters as listed below. These parameters should be provided for each proposed ESS application along with the operating mode and configuration of the ESS.

2.5.2.1 Point of electrical connection Identification

The point of electrical connection should be provided.

2.5.2.2 ESS Inverter Specification

The ESS customer shall provide the ESS inverter specifications and certifications. As discussed in section 2.1 of this Guide, any DER equipment paralleling with the EPS which in this case is an ESS inverter, regardless of configuration, shall be certified to the UL 1741 standard.

2.5.2.3 ESS configuration and Operating Sequence Specifications

The ESS customer shall provide the ESS system's specifications, including but not limited to the operating manual, control and wiring diagrams, and a detailed sequence of operations. Additionally, as the ESS system associated with the Net Metering DER is typically not permitted to both charge from and discharge (back feed) into the Dominion Energy's EPS, proof along with certification from a qualified installer or technician that the ESS has been properly installed and set up, per the manufacturer's specifications as to prevent charging from or back-feeding into the Dominion Energy's EPS will be required.

2.6 Net Metering DER Interconnection as it applies to IEEE Std. 1547-2018

A Net Metering DER is a "generating facility" or "generator," which is defined in the applicable regulations as "***an electrical generating facility consisting of one or more renewable fuel generators***" (see 20VAC5-315-20). Renewable fueled generators are mostly inverter based, a generation technology that has the capability of providing several smart functionalities.

2.6.1 Grid Support Capability Requirements

Dominion Energy defines grid support as DER equipment capabilities and functionalities required by IEEE Std. 1547-2018 for purposes of maintaining reliable operation of the EPS and responding to the variability of electric power supply and demand. These capabilities include real and reactive power support. Dominion Energy acknowledges the capability of most DER to provide grid support within their design

specification(s) and limitation(s). Although inverter based DER may be capable of providing a higher level of grid support using smart inverter functionalities, Dominion Energy is responsible for ensuring that EPS voltage remains within the ranges allowed by the respective state jurisdiction. Accordingly, Dominion Energy designs its EPS without creating a dependency on DER grid support functions for normal day to day operations of the EPS for reliability purposes, so that the safety and reliability of the EPS is not ceded to a third party. Dominion Energy has established the following standard to ensure that result: DER interconnection related upgrade(s) or infrastructure solutions shall initially be established to mitigate any voltage, thermal, power quality, and other safety related issues, at the DER customer's expense, before any DER is requested to provide grid support functionalities. Dominion Energy will use grid support functionalities for future operational issues, including but not limited to adverse operating conditions, after all infrastructure solutions and associated mitigation tools have been exhausted.

2.6.2 Ride-through Capability Requirements

Although Dominion Energy supports the IEEE 1547-2018 ride-through capability requirements for DER, Dominion Energy is not requiring the application or utilization of ride-through functionalities at this time. Table 4 below outlines current Dominion Energy requirements associated with DER Voltage ride-through. Please note any requirements within the table may be subject to change at Dominion Energy's discretion.

Voltage Range (p.u.)	Operating Mode	Clearing time (s)
1.20 – 1.10	Momentary Cessation	2
1.10 – 0.88	Continuous Operation	∞
0.88 – 0.50	Mandatory Operation	2
0.50 – 0.00	Momentary Cessation	0.16

Table 4: Dominion Energy Voltage Ride-Through Requirements
(Source: IEEE Std. 1547a-2020, Category III)

2.7 Other Net Metering DER Interconnection Study (Review) Parameters

For Net Metering DER that go through the full study process, additional interconnection study (review) parameters associated with Power Quality such as Rapid Voltage Change (RVC), flicker, harmonics typically will apply. Those parameters are described in the subsections below.

2.7.1 Power quality requirements

The goal of the DER interconnection study process is to ensure that any DER connecting to the EPS does not impact the power quality of Dominion Energy's system. Important power quality criteria evaluated during the DER interconnection study process include the following:

- Ensuring that voltage dip/rise or the Delta change in voltage does not exceed 3% of nominal voltage due.
- Ensuring that harmonic distortion levels do not exceed limits as defined in IEEE Std. 519-2014 and IEEE Std. 1547-2018.
- Ensuring simulated flicker on power system is maintained within the requirements defined in IEEE Std. 1547-2018.

2.7.1.1 Net Metering DER system's RVC and transformer inrush requirements

IEEE Std. 1547-2018 requires DER not to cause voltages to exceed 3% of nominal and 3% per second averaged over a period of one second when the Point of Interconnection (POI) is at medium voltage. Medium voltage is typically defined as voltage above or equal to 1 kV but less than or equal to 35 kV.

For a POI at low voltage, which is defined as voltages 1000 V and less per IEEE C62.41.2, IEEE Std. 1547-2018 requires DER not to cause voltages to exceed 5% of nominal and 5% per second averaged over a period of one second.

An excessive amount of RVC, even if it is infrequent, can have negative impact on power quality. For example, Dominion Energy customers with voltage sensitive processes or equipment have in the past experienced significant disruption due to RVC. Thus, Dominion Energy requires RVC to be limited to specific levels as described above and as established in the IEEE Std. 1547-2018.

2.7.1.2 Harmonics requirements

Dominion Energy has identified several areas of concern related to harmonics for DER such as harmonic contributions. Harmonics can be generated by several components of DER, including soft start units, power electronics, transformer energization, and saturation. The following subsections describe the harmonic study process and some mitigation solutions utilized when harmonic issues are identified.

2.7.1.2.1 Harmonics study process

Presently, Dominion Energy installs a power quality (PQ) meter or device at the POI to monitor harmonics for all DERs 250 kW and above while also providing visibility. For DERs 1,000 kW and above, PQ meters are typically placed at the POI before the DER is energized to record "background" harmonics. This allows Dominion Energy to study the harmonics that are contributed by the DER prior to energization and once energized.

All equipment that can produce harmonics should meet regulations limiting Total Harmonic Distortion (THD) to limits as defined in the latest revision of IEEE 519. If the power quality meters discussed above reveal significant issues at a DER site, the DER customer must mitigate the harmonics issues.

2.7.2 Transformer Loading Limit requirements

Reverse flow on a substation transformer will be limited to the base or Oil Natural Air Natural (ONAN) rating of the transformer. When evaluating the maximum aggregated DER on a distribution transformer, Dominion Energy considers a light load factor in addition to the ONAN rating of the transformer. The light load factor is defined as either the actual transformer light load, which is limited to daytime light load for PV only DER system, or 10% of the transformer top nameplate rating, whichever is the smallest. Ultimately, the maximum aggregate generation connected on a substation transformer will be limited to the summation of the transformer base rating and a light load factor, if any. This also ensures the maximum DER sites can be safely connected the circuit. Table 1 provides guidelines for a typical distribution transformer maximum allowable reverse flow and total allowable aggregate DER with respect to the transformer nameplate rating.

Transformer Nameplate Rating (MVA)	Maximum Reverse Flow ONAN (MVA)	Maximum Allowed Aggregate DER ONAN + LLF** (MVA)
6.5 *	3.9	4.6
6.5/7*	4.2	4.9
6/8/10	6.0	7.0
7.2/9.3/12	7.2	8.4
8.4/10.2/14	8.4	9.8
12/16/20	12.0	14.0
13.4/17.9/22.4	13.4	15.7
20.1/26.8/33.6	20.2	23.5
24/40	24.0	28.0
27/ 36/45	27.0	31.5
30/40/50	30.0	35.0
33.6/44.8/56	33.6	39.2
45/60/75	45.0	52.5
50.4/67/ 84	50.4	58.8

* Reverse Flow Rating for non-standard transformer is the lower of the ONAN rating or the base impeadance test rating.

** LLF = Light load factor and is assumed, for reference purpose, to be equal to 10% of the top nameplate rating of the transformer.

Highlighted - Standard Purchase Size

Table 1 : Transformer Chart - DER Limits

2.7.3 Circuit Loading Limit requirements

Dominion Energy has developed circuit loading limit criterion corresponding to the rating of largest conductors used in its system. The circuit loading requirements are described in sections 2.7.3.1 and 2.7.3.2 below.

2.7.3.1 Thermal Limit/ Physical Circuit Capacity

Dominion Energy standard 477 AAC wire size has a maximum rating of 644 A. However, given the limitation of other components such as disconnects and bushings, Dominion Energy established the standard circuit maximum ampere rating of 600 amps to be conservative. Table 2 below provides guidance on some typical circuit thermal limits, which have different megawatt (MW) equivalents depending on the distribution circuit operating voltage.

	12.5 kV	13.2 kV	23 kV	34.5 kV
MW	Amps	Amps	Amps	Amps
1	46	44	25	17
2	92	87	50	33
3	139	131	75	50
4	185	175	100	67
5	231	219	126	84
6	277	262	151	100
7	323	306	176	117
10	462	437	251	167
12	554	525	301	201
13	600	569	326	218
13.7		600	344	230
15			377	251
20			502	335
24			600	400
28				469
30				502
32				536
36				600

Table 2 : Amps per circuit voltage and equivalent MW

2.7.4 Equipment Reviews

As part of the interconnection study for a DER, Dominion Energy will assess the loading limit associated with interconnecting a generator. If Dominion Energy determines that any of the limits described in

previous sections (i.e. sections 2.4, 2.5.1, and 2.5.2) are exceeded, the following upgrade requirements may apply prior to the Interconnection of the DER. Those requirements include but are not limited to:

- Conductor upgrade
- Transformer upgrade to the next size up that will accommodate the addition of the DER
- Substation regulator and/or associated control upgrade
- Line regulator and/or associated control upgrade
- Addition of new express feeder
- Addition and/or upgrade of line recloser(s)
- Protection and coordination reviews
- Other equipment upgrades due to fault duty

3 Net Metering DER General Interconnection Parameters

Dominion Energy has two typical Net Metering DER connections depending on the size of the DER. These typical connections are DER less than 1MW in size and DER of size 1 MW and above. The connections and typical equipment installation configurations are discussed in sections 3.2 and 3.3 below and are applicable to all DER technologies. Appendix A provides additional information on the typical layout of associated DER interconnection or attachment facilities.

3.1 Net Metering DER Interconnection Generator Step-up Transformer Requirements

The following generator step-up (GSU) transformer requirements apply to all DER paralleling with the Dominion Energy EPS regardless of their applicable interconnection parameters. Any Dominion Energy supplied GSU transformer for use with the interconnection of a DER will have a Wye-grounded / Wye-grounded winding configuration. If a DER customer elects to have Dominion Energy supply the GSU transformer, steps must be taken to ensure that the DER protection system associated with inverters handles that type of configuration. For any GSU transformer supplied by the DER customer, Dominion Energy will require a GSU that has either a Wye-ground / Wye-ground or Wye-ground/Wye (DER Side) winding configuration.

3.2 Interconnection Parameters for Net Metering DER < 250 kW

For an interconnection of a Net Metering DER less than 250 kW, a bi-directional meter and a Company accessible, lockable load breaking disconnect will be required prior to the interconnection. Additional requirements for interconnection can be found in Dominion Energy's **Blue Book**. Details on the interconnection parameters for DER < 250 kW are provided in Figure 1 below.

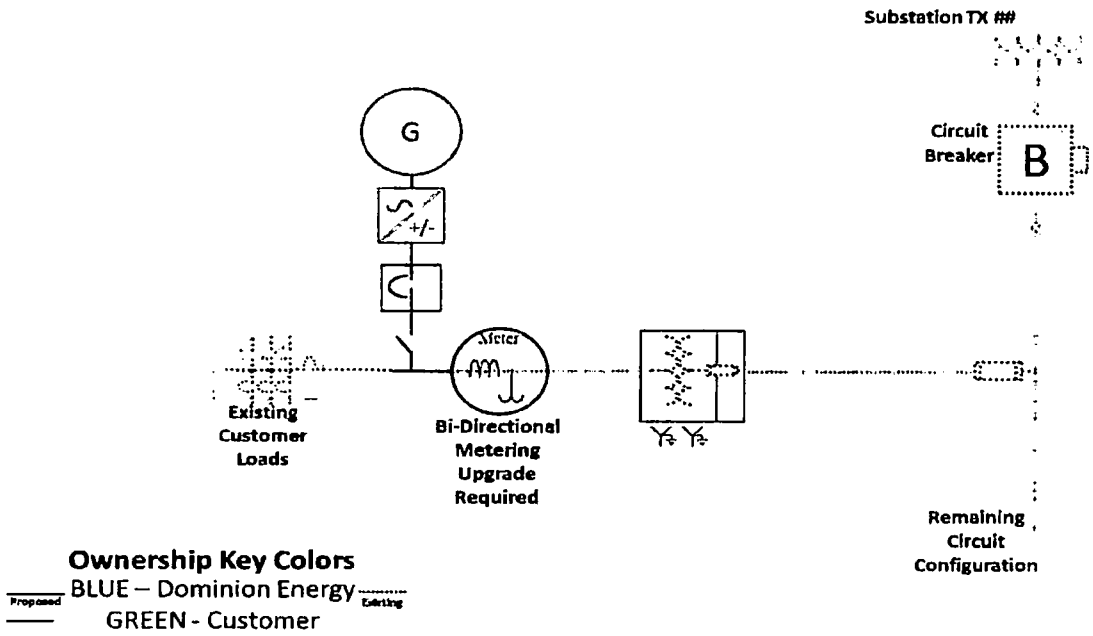


Figure 1: Typical Layout for Net Metering DER < 250 kW

3.3 Interconnection Parameters for Net Metering DER ≥250 kW and < 1,000 kW

The subsections below describe 2 different interconnection configurations for DER less than 1 MW and equal or above 250 kW.

3.3.1 Net Metering DER ⩾250 kW and < 1,000 kW (with no DTT required)

For the interconnection of a Net Metering DER 250 kW and above but less than 1,000 kW that do not require Direct Transfer Trip (DTT), the same requirements as described in section 3.2 apply along with a PQ device prior to interconnection. The Dominion Energy owned PQ device will have shunt trip capability of the customer owned breaker and will be located at the load side of the disconnect switch. The PQ device is meant to provide visibility of the Net Metering DER to the Dominion Energy's Regional Operation Center (ROC) by providing real time status of the generation through constant polling. Further details on the interconnection parameters for DER ≥250 kW and < 1,000 kW are provided in Figure 2 below.

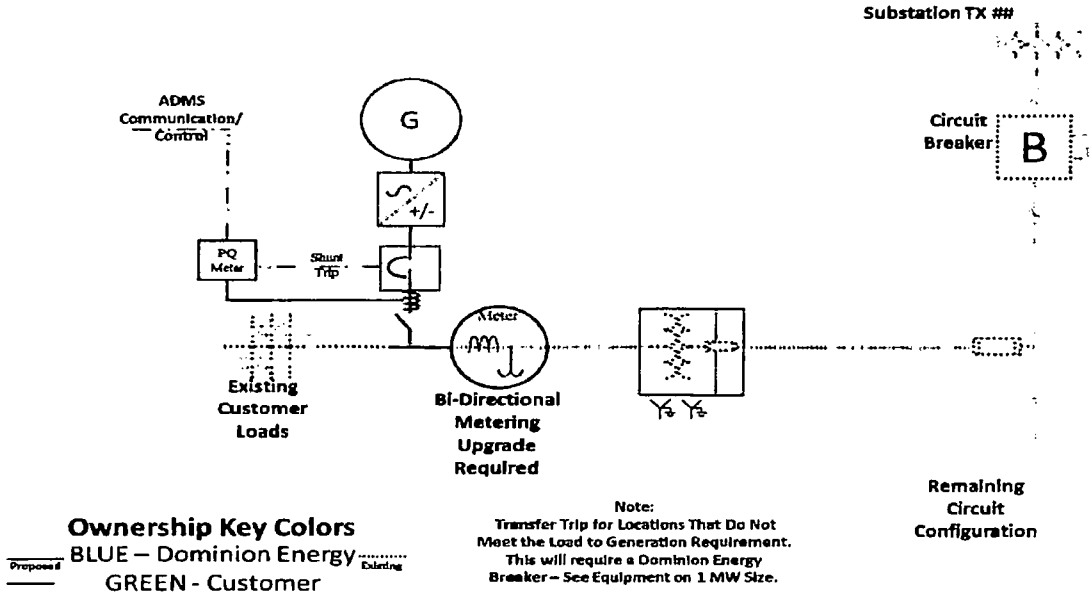


Figure 2: Typical Layout for Net Metering DER ≥250 kW and < 1,000 kW (No DTT required)

3.3.2 Net Metering DER ≥250 kW and < 1,000 kW (with DTT required)

For the interconnection of a Net Metering DER 250 kW and above but less than 1,000 kW that require Direct Transfer Trip (DTT), the same requirements as described in section 3.2 apply along with a Dominion Energy owned low voltage breaker and a PQ device prior to interconnection. The Dominion Energy owned PQ device will have shunt trip capability and will be located at the load side of the disconnect switch. The PQ device is meant to bring visibility of the Net Metering DER to the Dominion Energy's ROC by providing real time status of the generation through constant polling as well as control capability of the low voltage breaker. Further details on the interconnection parameters for DER ≥250 kW and < 1,000 kW that require DTT are provided in Figure 3 below.

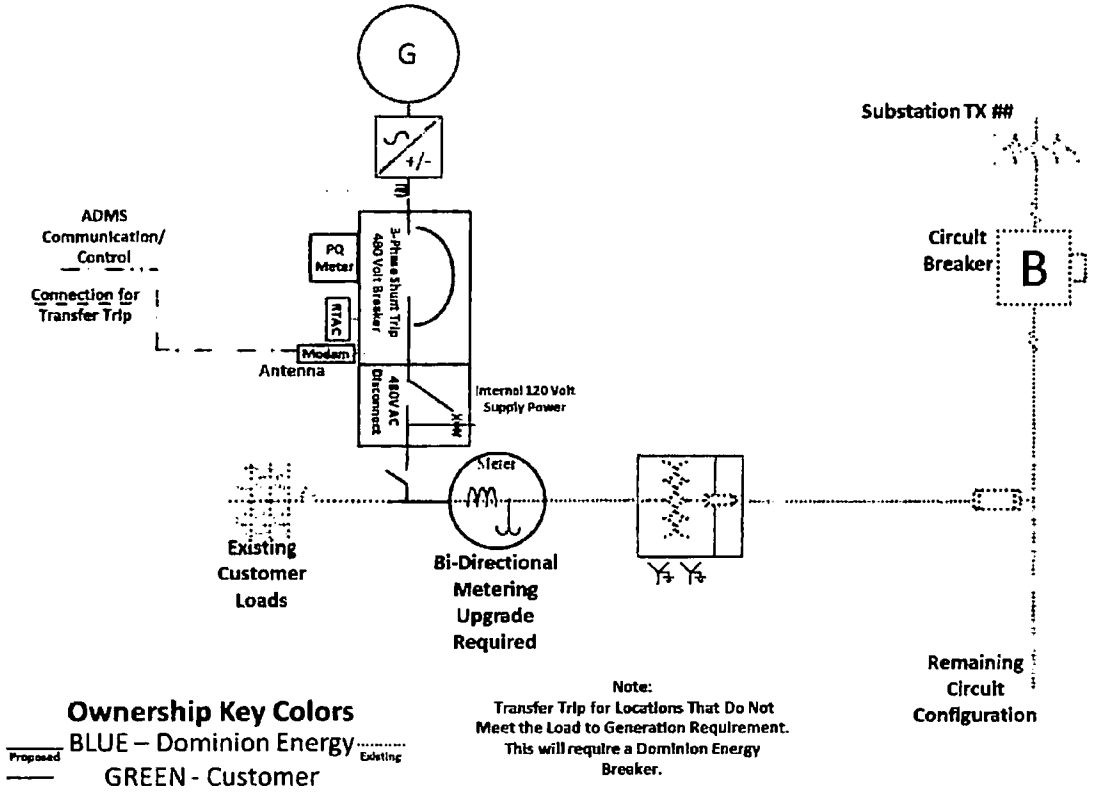


***Figure 3**: Typical Layout for Net Metering DER ≥250 kW and < 1,000 kW (DTT Required)*

3.4 Interconnection Parameters for Net Metering DER ≥1,000 kW and ≤3,000 kW

The following subsections describe the typical interconnection configurations for Net Metering DER ≥1,000 kW and ≤3,000 kW.

3.4.1 Net Metering DER ≥1,000 kW and ≤3,000 kW (Existing Service Transformer)

For the interconnection of a Net Metering DER 1,000 kW and above but not exceeding 3,000 kW that is connecting at the low voltage side of an existing service transformer, a low voltage breaker and a PQ device will be required prior to interconnection. The Dominion Energy owned PQ device will have shunt trip capability and will be located at the load side of the disconnect switch. The PQ device is meant to bring visibility of the Net Metering DER to the Dominion Energy's ROC by providing real time status of the

generation through constant polling as well as control capability of the low voltage breaker. Further details on the parameters of the external power supply are provided in Figure 4 below.

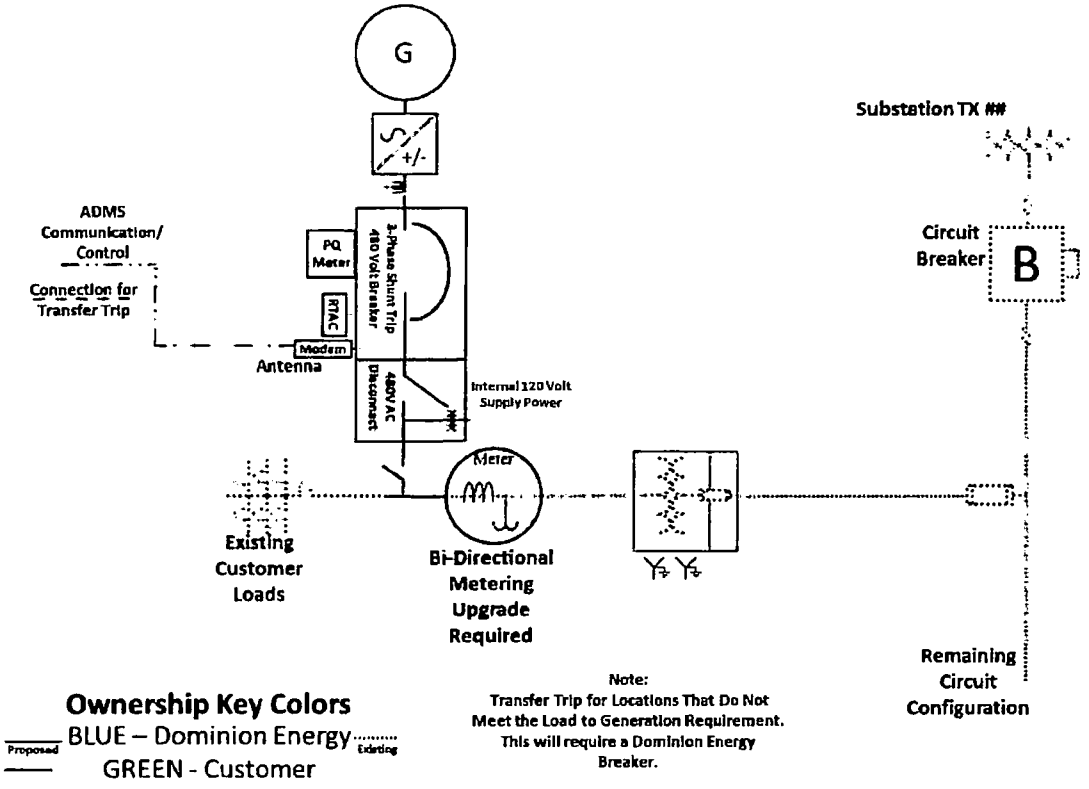


***Figure 4**: Typical Layout for Net Metering DER ≥1,000 kW and ≤3,000 kW (Existing Service Transformer)*

3.4.2 Net Metering DER ≥1,000 kW and ≤3,000 kW (Dominion Energy owned Transformer)

For the interconnection of a Net Metering DER 1,000 kW and above but not exceeding 3,000 kW that is connecting at the low voltage side of a Dominion Energy owned transformer, a recloser with a SEL-651R controller will be required at the medium voltage (primary) side of the transformer (i.e., typically 34.5 kV). Also, a Dominion Energy owned PQ device will be required at the low voltage side prior to interconnection. The PQ device will provide Dominion Energy's ROC real time status of the generation through constant polling as well as control capability of the POI recloser. The typical winding configuration of a Dominion

Energy owned distribution transformer will be Wye-ground / Wye-ground. Further details on the parameters of the external power supply are provided in Figure 5 below. Please note that facilities charges totalization/aggregation will typically apply.

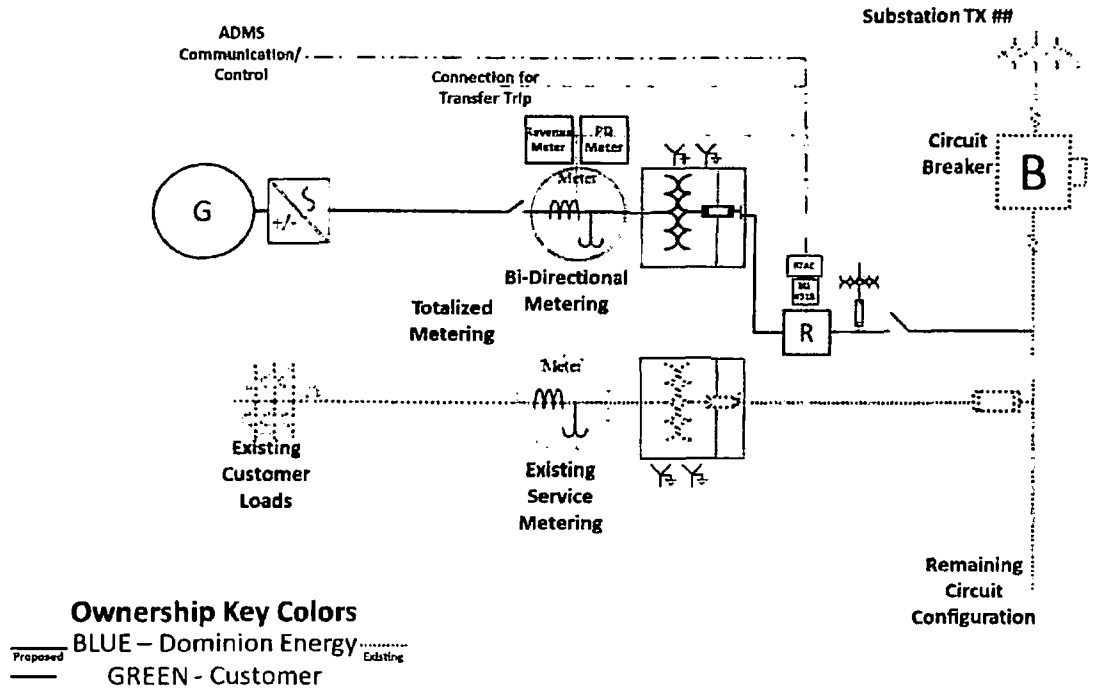


Figure 5: Typical Layout for Net Metering DER ≥1,000 kW and ≤3,000 kW (Dominion Energy owned Transformer)

3.4.3 External power supply for Net Metering DER ≥1,000 kW and ≤3,000 kW (Dominion Energy owned Transformer)

For Interconnection of Net Metering DER 1,000 kW and above but not exceeding 3,000 kW, with Dominion Energy owned transformer, the customer has the option of obtaining an external power supply up-line from the POI to the DER site for service power needs. This could be an alternate power supply to the site for emergency/auxiliary load. Further details on the parameters of the external power supply are provided in Figure 6 below. Please note that facilities charges for totalization/aggregation costs will typically apply.

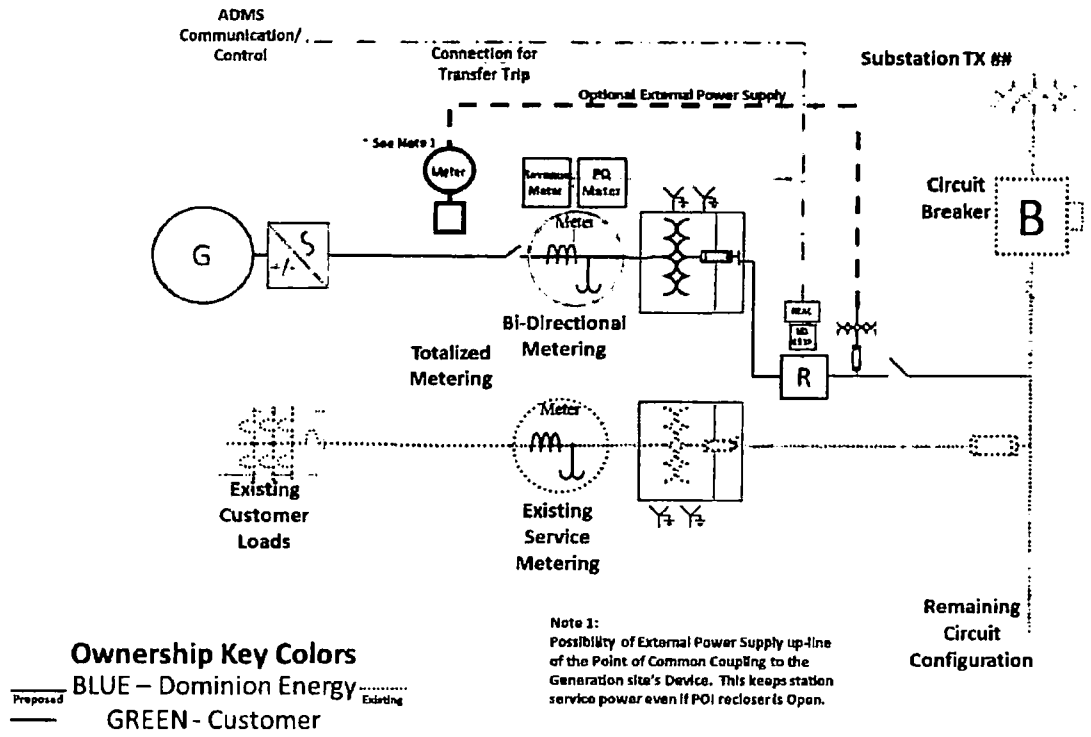


***Figure 6:** External Power Supply for Net Metering DER ≥1,000 kW and ≤3,000 kW (DER customer-owned Transformer)*

3.4.4 Net Metering DER ≥1,000 kW and ≤3,000 kW (DER customer-owned Transformer)

For interconnection of Net Metering DER 1,000 kW and above but not exceeding 3,000 kW, a Dominion Energy owned recloser with a SEL-651R controller and a PQ device will be required prior to interconnection. The Dominion Energy owned PQ device will provide Dominion Energy's ROC real time status of the generation through constant polling as well as control capability of the POI recloser. Further details on the parameters of the external power supply are provided in Figure 7 below.

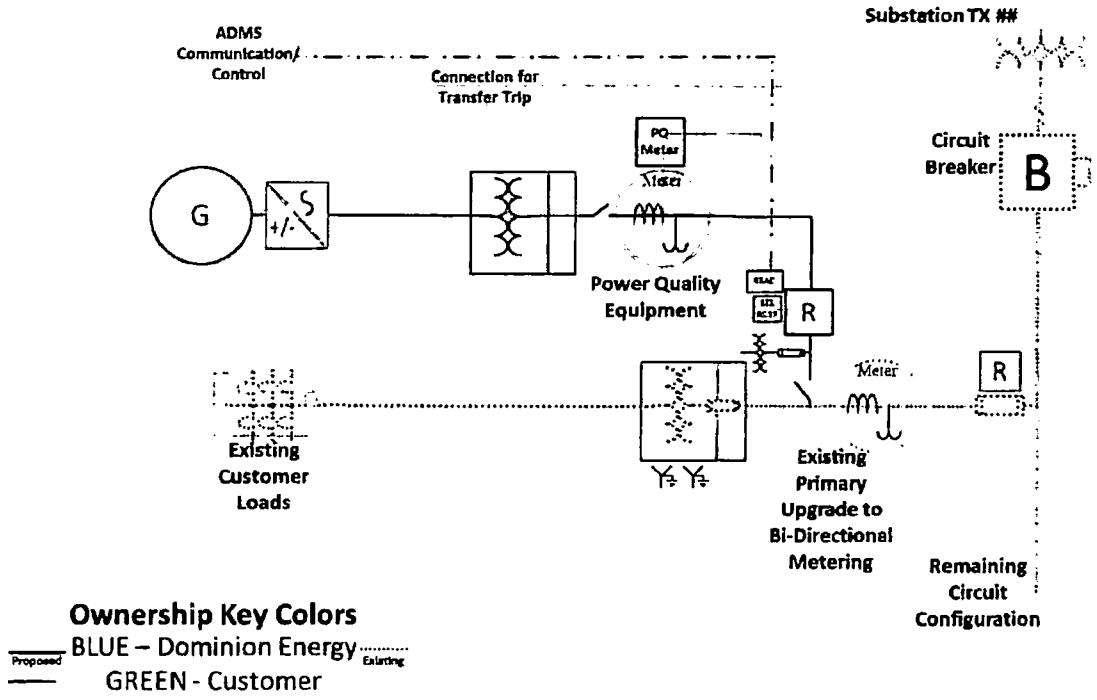


Figure 7: Typical Layout for Net Metering DER ≥1,000 kW and ≤3,000 kW (DER customer-owned Transformer)

3.4.5 External power supply for Net Metering DER ≥1,000 kW and ≤3,000 kW (DER customer-owned transformer)

For interconnection of Net Metering DER 1,000 kW and above but not exceeding 3,000 kW, with customer owned GSU, the customer has the option of obtaining an external power supply up-line from the POI to the DER site for service power needs. This could be an alternate power supply to the site for emergency/auxiliary load. Further details on the parameters of the external power supply are provided in Figure 8 below. Please note that facilities charges for totalization/aggregation costs will typically apply.

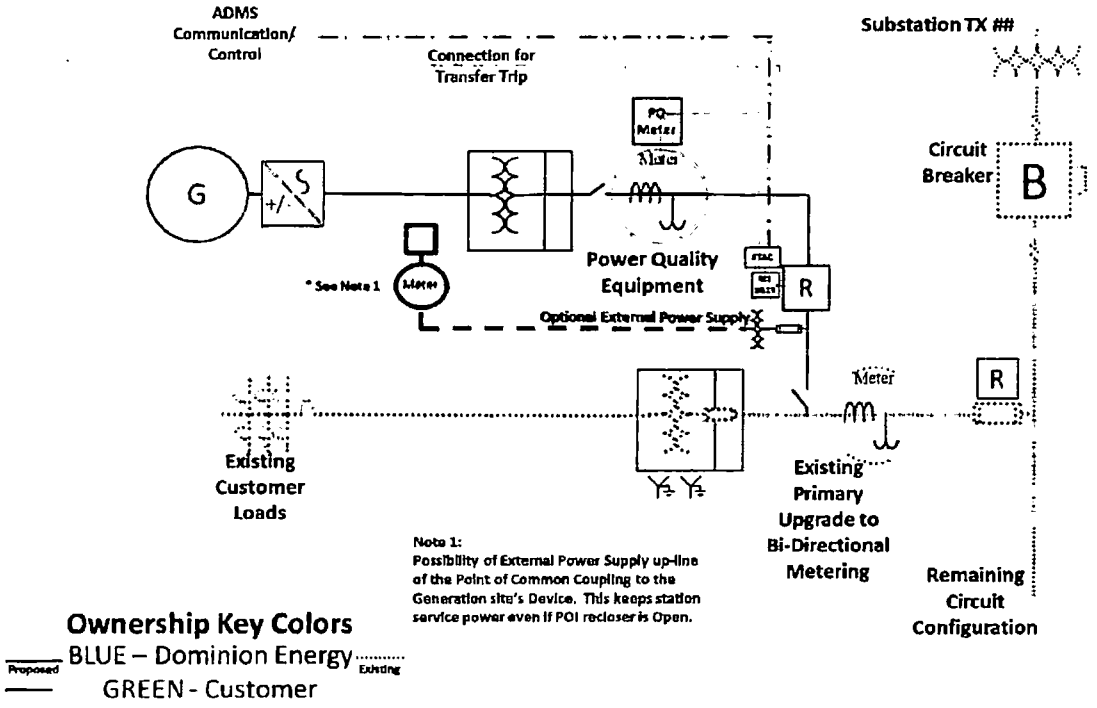


Figure 8: External Power Supply for Net Metering DER ≥1,000 kW and ≤3,000 kW (DER customer-owned Transformer)

4 Applicable Guides, Codes & Standards, State Jurisdictional Rules & Procedures

The following list of applicable guides, codes and standards, state jurisdictional rules and procedures is not meant to be exhaustive. Procurement and understanding of standards referenced within this document are the responsibility of interconnection customer.

20 VAC 5-314: Code of Virginia, State Corporation Commission, Chapter 314, Regulation Governing Interconnection of Small Electrical Generators.

Docket No. E-100, Sub 101: North Carolina Utilities Commission, Interconnection Procedures, Forms and Agreements, For State-Jurisdictional Generator Interconnections.

IEEE Std. 1547-2018: IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces.

IEEE Std. 1547a-2020: IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces.

Amendment 1: To Provide More Flexibility for Adoption of Abnormal Operating Performance Category III.

IEEE Std. 1547.1: IEEE Standard Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems.

UL 1741: Inverters, Converters, Controllers, and Interconnection System Equipment for Use with Distributed Energy Resources.

UL 6141: Wind Turbines Permitting Entry of Personnel.

UL 6142: Small Wind Turbine Systems.

UL 1973: Standard for Batteries for Use in Stationary, Vehicle Auxiliary Power and Light Electric Rail (LER) Applications.

UL 9540: Standard for Energy Storage Systems and Equipment.

IEEE 519-2014: IEEE Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems.

IEEE P2030.2.1/D7.0: IEEE Draft Guide for Design, Operation, and Maintenance of Battery Energy Storage Systems, both Stationary and Mobile, and Applications Integrated with Electric Power Systems.

IEEE 2032.2-2015: IEEE Guide for the Interoperability of Energy Storage Systems Integrated with the Electric Power Infrastructure.

ANSI C84.1: Electric Power Systems and Equipment—Voltage Ratings (60 Hz).

IEEE 1453-2015: IEEE Recommended Practice for the Analysis of Fluctuating Installations on Power Systems.

IEEE C62.92.6-2017: IEEE Guide for Application of Neutral Grounding in Electrical Utility Systems, Part VI – System Supplied by Current-Regulated Sources.

IEEE C62.41.2: Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and less) AC Power Circuits.

NFPA 70: National Electric Code (NEC).

NFPA 855: Standard for the Installation of Stationary Energy Storage Systems.

NESC: National Electrical Safety Code.

APPENDIX A:
Typical Layout of Connection Facilities

***Figure 1**: Typical Primary Distribution Facility Layout (1,000 kW and above)*

Typical Primary Facility Layout
Disconnect, G&W Recloser, Meter, and Disconnect
May vary depending on project requirements

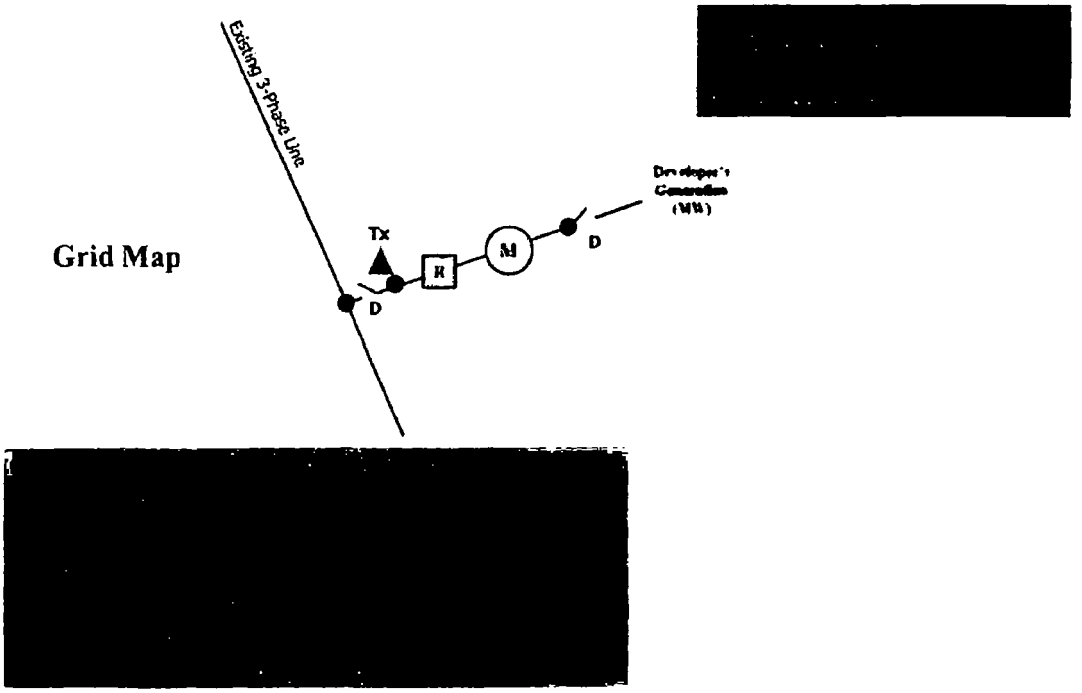


Figure 2: Typical Primary Distribution Facility Layout with additional details (DER customer owned transformer)

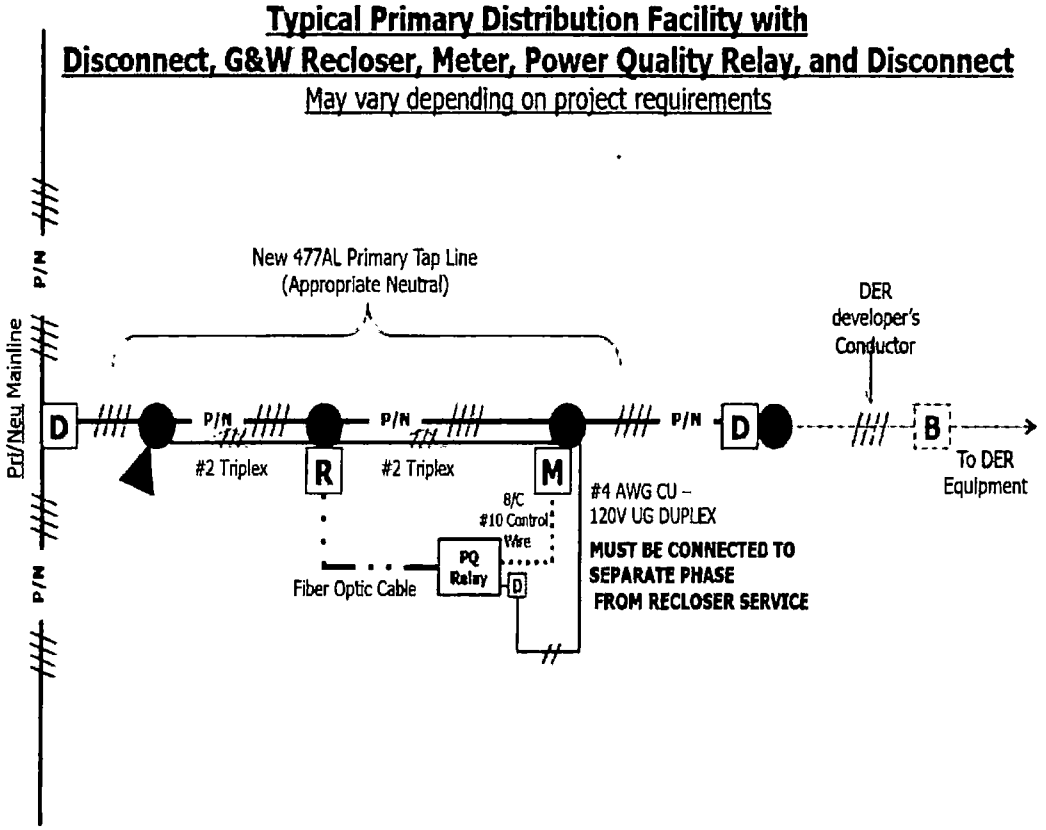
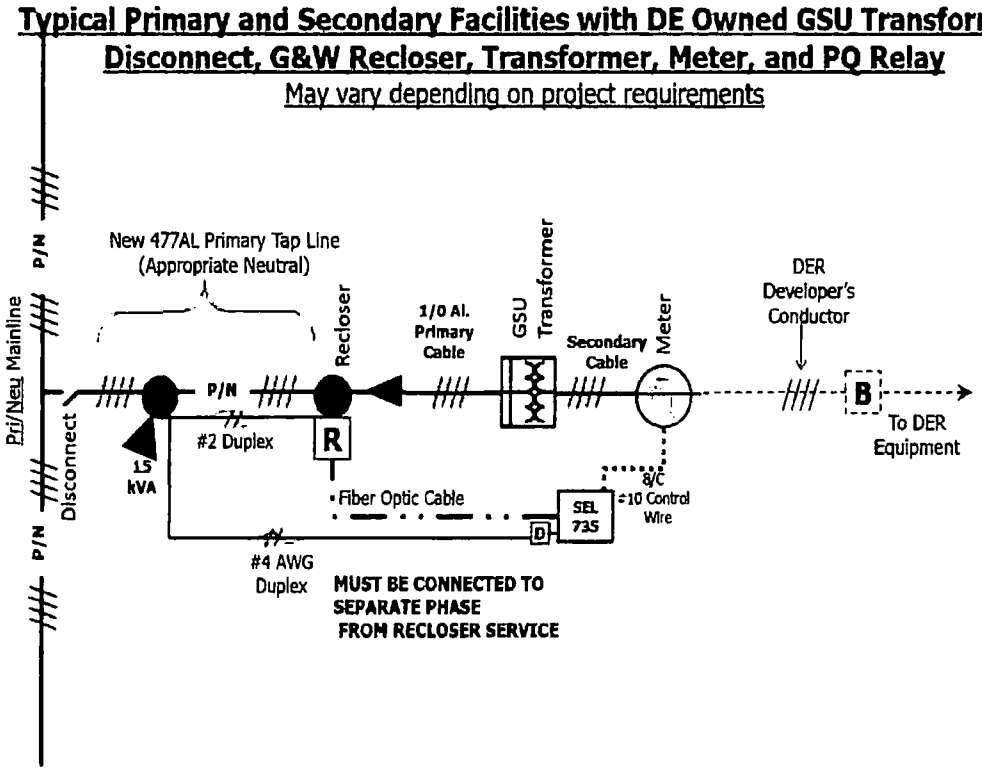


***Figure 3**: Typical Primary and Secondary Distribution Facilities Layout (Dominion owned transformer)*



APPENDIX B: ESS Interconnection Configurations

This Appendix shows the typical ESS configurations. This is only an illustrative example of potential configurations and is not an exhaustive list. Dominion Energy may add or modify configurations in the future.

C1 DC coupled ESS

A DC coupled ESS consists of a uni-directional DC-AC inverter which is shared by both the ESS and the renewable resource (i.e., typically Solar PV). Although, the ESS's DC to DC converter is designed to be bi-directional, the design is such that the ESS can only be charged by the DC source. This configuration is subject to of Dominion Energy's Net Metering DER interconnection study parameters.

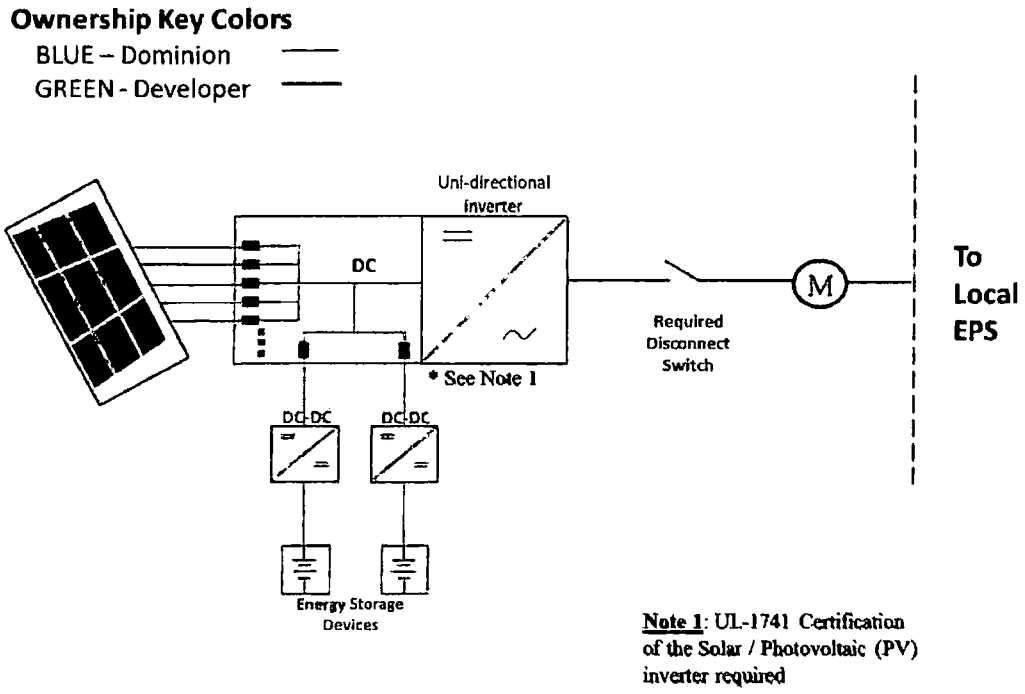


Figure 4: DC coupled ESS (Configuration 3)

APPENDIX C: Estimated facilities costs for typical DER upgrades

ESTIMATED FACILITIES COSTS REVISION HISTORY:

Facilities Costs type	Date	Revisions
Distribution Improvement	March 2021	Initial Release
Substation Improvement	February 2021	Initial Release

Disclaimer:

The following cost estimates are not binding for actual facilities costs and are provided for informational purposes only to assist customers in their planning for DERs. These cost estimates have not been determined in connection with any particular interconnection and are subject to change at any time by Dominion Energy. In addition, other substation upgrades and protection facilities that are not identified below may be required for transformers. The distribution and substation improvement estimates are for materials only; engineering, labor, and construction costs are adders. Notwithstanding these cost estimates, a customer shall be responsible for the actual costs for any required distribution and substation improvements required for the interconnection of its DER.

Distribution Improvement:

1-Mile of Small 1-phase Wire Upgraded to 3-phase 477 AAC	$ 415K - $ 600K
1-Mile 3-phase Re-Conductor from Small Wire to 477 AAC	$ 440K - $ 635K
1-Mile Conversion to 34.5 kV - Same wire	$ 439K - $ 680K
1-Mile Over-build Existing Line with 477 AAC	$ 515K - $ 780K
1-Mile Conversion and Re-Conductor to 477 AAC	$ 660K - $ 980K
Adder[2] – Distribution Wire Upgrade, Overbuild, or Conversion (Engineering \ Mobilization \ Construction Management)	$ 195K - $ 440K
Install New or Replace Existing Recloser with G&W Unit	$ 100K
Install New 1- 1-phase Regulator	$40k
Install New 3- 1-phase Regulators as a Bank	$ 100K
Adder[3] - Off-Road Work - 1- Mile - Varies	$ 400K - $ 550K
Adder[4] - Permit/Hours Restrictions - 1-Mile of Work - Varies	$ 80k - $120k
Adder[5] - 2000 Feet of Environmental Matting	$ 200K
Install Power Quality Equipment	$ 15k - $ 17k
Install new over-head service transformer	$ 4k -14k
Install new pad-mount service transformer	$ 30k - $ 100k

[2] This adder is applicable to the following distribution improvement work, and is not on a per mile basis:
- o 1-Mile of Small 1-phase Wire Upgraded to 3-phase 477 AAC.
- o 1-Mile 3-phase Re-Conductor from Small Wire to 477 AAC.
- o 1-Mile Conversion to 34.5 kV - Same wire.
- o 1-Mile Over-build Existing Line with 477 AAC.
- o 1-Mile Conversion and Re-Conductor to 477 AAC.

[3 4 5] These adders could apply to any distribution improvement work

1-Mile Fiber Install for Transfer Trip	$150k - $250k
Install Low Voltage Breaker & associated devices/equipment	$60k - $90k

Substation Improvement:

Adding New Circuit Breaker (34.5 kV) in Existing Bay	$ 200K
Adding New Circuit Breaker (34.5 kV) and Adding New Bay	$ 250K
Adding 115/34.5 kV, 20/27/33.6 MVA Transformer	$ 1,200K - $ 1,300K
Adding 230/34.5 kV, 20/27/33.6 MVA Transformer	$ 1,300K - $ 1,400K
Adding 230/34.5 kV, 33.6/44.8/56 MVA Transformer	$ 1,400K - $ 1,500K
Adding 230/34.5 kV, 50.4/67/84 MVA Transformer	$ 1,500K - $ 1,600K
DG Relay Panel Only	$ 250K
Additional Typical Protection - Varies	$ 150 - $ 250 K
10-Foot Control Enclosure Expansion	$ 250K
New Control Enclosure	$ 500K
Adder[6] - TX Engineering \ Mobilization \ Construction Management	$ 200K - $ 1,200K

[6] This adder is applicable to all substation improvement work.

Exhibit B

VA-DSA

April 25, 2023 Letter to Dominion

VADSA

April 25, 2023

Via UPS Next Day Delivery and via email Robert.M.Blue@dominionenergy.com

Mr. Robert M. Blue
President and Chief Executive Officer
Dominion Energy
120 Tredegar Street, Pump House
Richmond, VA 23219

Dear Mr. Blue,

On behalf of the many K12 public schools, communities and other public and private entities served by members of the Virginia Distributed Solar Alliance (VA-DSA), we are writing to request, for net-metered projects up to and including 1 MW (AC), **an immediate suspension** of the *Interconnection Parameters for Net Metering Distributed Energy Resources* issued by Dominion Energy Virginia on December 20, 2022 ("December Interconnection Parameters"). We ask that such suspension continue until resolution of issues being addressed as set forth in the March 3, 2023 Order of the Virginia State Corporation Commission (SCC) in SCC Docket No. PUR-2022-00073 on Interconnection-Related Issues ("March Interconnection Order").

Such a suspension is appropriate given SCC staff findings reported out on September 19, 2022, that the most significant impediment to solar development in Virginia involve Dominion-imposed interconnection requirements, which then resulted in the March 3, 2023, Interconnection Order. Now that the SCC has provided for a working group process starting in August 2023 to start addressing what appropriate new interconnection requirements should be via working group recommendations, pilot studies and regulation reforms, it is premature for Dominion to unilaterally impose new interconnection requirements before the SCC process is complete.

Such a suspension is crucial because the December Interconnection Parameters impose Direct Transfer Trip (DTT), dark fiber, and distributed generation (DG) relay panel requirements that create substantial new costs for net-metered projects from 250 KW to 1 MW AC. As noted in Dominion's Interconnection Parameters on page 35, dark fiber costs $150,000 to $250,000 per mile. A DG Relay panel costs $250,000 for the equipment plus an additional $200,000 to $1,200,000 for engineering, mobilization, and construction management. In many if not most cases, these costs make solar projects unfeasible for public schools, municipalities, and other public and private entities seeking to achieve their sustainability goals through solar energy. Dominion's interconnection requirements are especially detrimental for rural schools and communities where Dominion's distribution grid is least developed, and the se customers are most often least able to afford these costs. They are also decimating the Virginia solar industry and threatening to trigger massive job losses for solar developers, installers, and many other peo ple employed by these small businesses.

The premature imposition of the December Interconnection Parameters could not have come at a worse time because it threatens Virginia's ability to maximize funding from the Inflation Reduction Act (IRA). Such IRA funding is needed to make implementation of the Virginia Clean Economy Act (VCEA) more affordable for Dominion

ratepayers. Premature imposition of the December Interconnection Parameters will exacerbate the flight of investment capital and Virginia taxpayer dollars to other states with more solar-friendly policies.

Premature imposition of the Dominion December 2022 Interconnection Parameters also robs Dominion and its ratepayers of benefits resulting from reductions in coincident summer daytime peak demand from the solar arrays, and of the ability to meet Dominion's Renewable Portfolio Standards (RPS) more affordably under VCEA for projects up to 1 MW (AC) per VA Code § 56-585.5(C) Generation of electricity from renewable and zero carbon sources.

Since 2022, a growing number of small-scale solar projects in Virginia are struggling with high Dominion interconnection costs, making it difficult for small scale solar projects to be economically feasible. A representative sample of these projects is shown on **Attachment A** to this letter that does not include numerous solar projects under development by other developers. These examples demonstrate how the prohibitive costs of interconnection, which can be up to 40% of the total project cost, can make small-scale net-metered solar projects in Virginia unbankable. These costs are not proportionate to the size of the projects, which are all 1 MW (AC) or less. Such costs pose a significant barrier to the deployment of small-scale solar projects across the Commonwealth. These costs are particularly challenging for public schools, municipalities, and other public and private entities seeking to achieve their sustainability goals, especially in rural communities, as they often have limited budgets and resources.

Moreover, the waiver of these Dominion interconnection requirements for certain projects in Dominion territory in the past establishes that DTT and dark fiber requirements can be foregone without impacting the safety, reliability, and operability of the grid.

An immediate suspension of the December Interconnection Parameters for small scale net-metered solar projects up to 1 MW (AC) is both appropriate and necessary pending the outcome of the SCC working group to review the interconnection standards and develop recommendations for pilot studies and regulation reforms that address the concerns of stakeholders.

As concerned small business solar installers and developers of VA-DSA, and on behalf of the communities we serve, we urge Dominion Energy to take a leadership role in promoting renewable energy. Suspending the December Interconnection Parameters now would help promote equitable treatment of all ratepayers, avoid imposing undue barriers on customer access to solar, and encourage private investment and job creation for small commercial scale solar projects in Virginia while the SCC sorts out what new requirements are appropriate for net metering projects up to 1 MW.

Thank you for your attention to this matter. We would very much appreciate your response within 10 business days. Thank you.

Sincerely,

Anthony E. Smith, PhD
Co-leader, VA-DSA
President and Founder, Secure Solar Futures

ATTACHMENT A: REPRESENTATIVE SAMPLE OF 2022-23 PROJECTS

1. **Red River Foods**, commercial customer, 562 KW (AC), rooftop solar project in Richmond, VA. **Tiger Solar** is solar installer: Dominion requiring dark fiber DTT, interconnection cost estimated at $526,000 plus another $300/mo in Dominion maintenance costs (Interconnection cost is 33% of total project cost).

2. **Piedmont Virginia Community College**, 300 KW (AC), **Tiger Solar** is solar installer. NMIN application submitted in January 2023, still pending reviews from Dominion Transmission team, Substation team on dark fiber, and Peer Review Team.

3. **Habitat for Humanity of South Hampton Roads**, 85 kW DC solar project in Norfolk, VA. **Norfolk Solar** is the solar developer and **Convert Solar** is the solar installer. Dominion charging for upgrade of Dominion's own equipment, as they claim site needed a new pole/transformer for this small project $16k at installer's cost. Total project cost was $142,887 before the interconnection costs of $16,054 imposed by Dominion. Current project status is complete and operational. (Interconnection cost is 11% of total project cost). NMIN filed in March 2022. Dominion notified on June 6th, 2022, that the customer would like to proceed with the transformer upgrade. The contingent approval letter for the project was provided by Dominion on November 9th, 2022. PTO (permission to operate) was issued by Dominion on January 4th, 2023.

4. **Chesterfield County Public Schools**, Matoaca Elementary School, 320 KW (AC) rooftop solar project in Chesterfield, VA. **Convert Solar** is the solar installer, PPA is with BrightSuite. Exceptionally long wait periods to get feedback. Estimated interconnection cost is $300,000 (Interconnection cost is 40% of total project cost). Project had to be downsized, at significant cost to installer, to 250 KW (AC) to avoid interconnection costs. This was the 6th of similar projects, where the previous 5 projects had been previously approved by Dominion without such interconnection costs.

5. **Grand Market** in Newport News. 900 KW (AC). **Convert Solar** is the installer. Exceptionally long wait periods to get feedback. Estimated interconnection cost is $370,000 (Interconnection cost is 22% of total project cost). Owner who has done other similar projects with Convert Solar cannot proceed with this project due to interconnection costs.

6. Various solar projects (4 to 6) over 250 KW with **Convert Solar**, proposed in Q4 2022 and Q1 2023, all stalled pending Dominion studies where NMIN application period has exceeded 60 days.

7. **Augustas Solar** community solar project, 975 KW (AC) in Augusta County, VA. **Secure Solar Futures** and LEAP (a Charlottesville, VA non-profit) as solar co-developers/owners. Dominion requiring dark fiber for 4.5 miles plus substation improvements and reclosers -> additional $1 million in upgrades. (Interconnection cost is 40% of total project cost)

8. **Prince William County Public Schools**, Freedom High School solar project, approx. 900 KW (AC). **Secure Solar Futures**. Dominion is now past the 60-day period for interconnection response.

9. Numerous public school solar projects under development by **Sun Tribe Solar** are similarly negatively impacted by the high interconnection costs, requirements, and delays.

**The bold-faced organizations listed above include EPCs, solar developers and customers who are representative of the many companies and customers adversely affected by Dominion's Interconnection Parameters.*

Exhibit C

Dominion May 4, 2023 Reply to April 25, 2023 VA-DSA Letter

Dominion Energy Virginia
New Technology & Energy Conservation
Mailing Address:
P O Box 26666, Richmond, VA 23261
DominionEnergy.com

Dominion Energy

May 4, 2023

Anthony Smith, PhD
11 E Beverley St., Ste 19
Staunton, VA 24401

Re: Interconnection parameters for net metered distributed energy resources

Dear Mr. Smith,

Thank you for your April 25, 2023 letter to Bob Blue, President and Chief Executive Officer of Dominion Energy regarding interconnection parameters for net metered ("NEM") distributed energy resources ("DER") connecting to our grid in Virginia. We recognize the importance of efficiently processing DER interconnection requests and appreciate your organization's commitment to achieving sustainability goals through solar energy.

Dominion Energy Virginia ("DEV") is committed to facilitating the interconnection of all eligible net metered solar projects in a safe and efficient manner. In recent months, we have been receiving requests for net metered projects of increasingly larger sizes, such that many projects will deliver energy to the distribution grid at a magnitude that could cause adverse grid conditions in certain circumstances. These requests require careful study to understand the specific impacts of each interconnection to the safety, reliability, and operability of the grid.

Under this study process, and as outlined in Dominion Energy's NEM DER Interconnection Parameters Manual, DEV analyzes all projects greater than 250kW to determine whether there is adequate load on the local distribution feeder to ensure a customer-owned inverter will disconnect quickly during fault conditions. The analysis of each project and the nearby grid determines whether communication-assisted protection, or direct transfer trip ("DTT"), is needed to maintain safe and reliable grid operation once the solar project is operational.

Suspending the diligent consideration of safety and reliability assessments of the largest DER on a case-by-case basis could compromise the safety of our personnel, communities we serve, and integrity of the grid. Accordingly, the Company cannot agree to suspend the interconnection parameters outlined in the NEM DER Interconnection Parameters Manual. The DEV engineering and leadership teams remain available to clarify the interconnection requirements outlined above should you have any further questions.

Regards,

Nathan Frost
Director – New Technology & Energy Conservation
Dominion Energy Virginia

Exhibit D

Norfolk Solar, LLC May 2023 Letter

May 22, 2023

To whom it may concern,

Norfolk Solar LLC and Norfolk Solar Qualified Opportunity Zone Business are small local businesses dedicated to installing solar in low-income, under-resourced and vulnerable areas. Since 2019, we have installed over $1M of solar in LMI neighborhoods in Virginia, in particular Qualified Opportunity Zones, which tend to be strongly minority, low-income neighborhoods. We have also worked with our installer to hire and train new solar installers from these neighborhoods, to ensure that the neighborhoods benefit not only from the solar energy and reduction in energy bills, but from new job opportunities. We have been featured frequently in local, state and national media.

Norfolk Solar works with investors to bring their money to Virginia and deploy it to install solar on businesses and non-profits such as churches in these vulnerable neighborhoods. Because of the delays and excessive costs being imposed by Dominion on new commercial solar installs, no additional commercial solar investments have been started by our business since the altered rules were imposed unilaterally by Dominion in December in 2022. The pricing and timing uncertainty for commercial solar due to these new regulations has meant that the solar installer we work with can no longer reasonably quote on commercial solar installs until these issues are resolved. So because of these recently imposed regulation modifications, our business is at a stand-still, we are not bringing new investment dollars to Virginia, and the neighborhoods that could be benefiting from solar installs and additional solar jobs no longer are. We also can no longer inspire other investors and deployment groups to follow our example.

We very much hope that the interconnection regulations can be restored to where they were before December 2022, and then any future changes evaluated to ensure that they do not risk the businesses of commercial solar installers, and the ability of businesses like ours to attract investment dollars to Virginia. This is particularly crucial right now, because of the influx of dollars in renewable energy due to the incentives of the Inflation Reduction Act.

(signed)_____

Ruth McElroy Amundsen

Alden Cleanthes

Norfolk Solar LLC

www.norfolksolar.org

Exhibit E

Sun Spots LLC May 2023 Letter

May 22, 2023

To whom it may concern,

Sun Spots LLC is a small business I started, originally to install solar on Virginia homes using Power Purchase Agreements (PPAs). Due to Virginia law, PPAs can only be entered into for a residential system if the resident qualifies as low-income. I have expanded the scope of my business to include small commercial and non-profit solar installs. I have been financing the installation of solar in Virginia with this business for the last two years. I am proud of my impact on the low-income communities in Hampton Roads with this work.

I have not entered into any new agreements for small commercial or non-profit installs since the new Dominion regulations were introduced in December of 2022. These new regulations are so burdensome that the solar installer I depend on can no longer quote commercial jobs with any assurance that they won't be delayed by studies, made more costly by new requirements and extra equipment, or simply languish in an approval queue for months on end. Right now I would really like to be maximizing my installs in low-income communities, because of the extra tax incentives for that in the Inflation Reduction Act. If the solar landscape in Virginia does not improve, I would be dismayed to have to look at deploying my investments in other states instead, that have policies and utilities more conducive to small solar deployment.

I hope that the interconnection regulations can be restored to where they were before December 2022, and then any future changes evaluated to ensure that they do not risk the businesses of commercial solar installers and financiers.

(signed)_____

Ruth McElroy Amundsen

Sun Spots LLC

Norfolk Virginia

757-478-3024