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Hiding Our Light Under a Rate-Basket:

Analysis of Utility Standby Charges for Siting of Solar Generation Projects

Introduction

Both to ease the strain on our aging energy infrastructure and to combat climate change by relying less on carbon-intensive and environmentally-harmful generation methods, the United States needs to begin to focus a large effort to develop alternative, renewable energy resources and market structures. As the population of the United States grows, and energy use increases, it will be increasingly difficult to meet energy demands, especially during peak use times.[1] Complicating the looming problem of how to meet our future energy demands, there is also a growing concern, nationally and internationally, that we are reaching a critical stage in terms of the amount of carbon dioxide present in our atmosphere.

Of the total amount of carbon emissions in the United States, 41% of those are a result of electrical energy generation.[2] The EPA's 2012 U.S. Greenhouse Gas Inventory Report found that U.S. greenhouse gas emissions totaled 6,821.8 million metric tons in 2010.[3] This same report found that from 2009 to 2010, U.S. emissions rose by 3.2%, primarily due to an improving economy and a resulting increase in multi-sector energy consumption. Combine the increase due to the economic upswing with the increased use of air conditioning during the same period in response to record high summer

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[1] According to some experts, there will be a 35% increase in energy demand by 2030. National Academy of Sciences, Energy Supply and Demand available at http://www.nap.edu/reports/energy/supply.html.
[2] 2012 U.S. Greenhouse Gas Inventory Report, Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2010, (April 2012) available at http://www.epa.gov/climatechange/emissions/co2_human.html.
[3] *Id*.

temperatures across the nation, and it is amazing that the increase in emissions was not higher.[4]

To meet America's future energy demands, the United States will need to rely on a combination of energy conservation measures and alternative generation technologies. Although there are conservation methods available–such as implementation of energy efficiency measures in building codes and appliance standards– to help lower energy demand and conserve dwindling energy resources, an increase in renewable resource generation must occur if we are to meet future energy demands. Large-scale wind farms and solar farms are already being employed to increase our national supply of renewable energy, but these projects are often met with controversy. To create a vibrant renewable energy market, we will need to create incentives and policies that support residential, small-scale renewable generation installations.

This paper will examine energy policies surrounding residential, on-site solar generation, with an eye towards determining how to create a supportive regulatory framework to fuel market growth. Specifically, the paper will focus on barriers to small-scale solar development, such as standby charges. Because it is impractical to completely disconnect from the grid, unless a customer has its own backup source of power, customer-generators must interconnect to the utility's electrical grid.[5] In light of this interconnection, utilities often assess standby charges on customer-generators of solar energy, claiming that utilities must be prepared at any time to jump online and cover a loss of energy supplied to the grid in the event that the on-site generation stops producing

[4] *Id.*
[5] EEA Consulting Firm website, State Standby Charges available at http://www.eea-inc.com/rrdb/DGRegProject/StandbyRates.html.

power.[6] The amount of this standby charge has a strong effect on the economic viability of an on-site solar generation project and an exorbitant standby charge can effectively kill a project before it even starts.

Net Metering and Distributed Generation

Customer-generators pose a unique problem for utilities when it comes to determining the appropriate rate at which these on-site generators should be charged for use of the utility's services. On-site generation offsets much of the need for these customers to purchase energy from the utility, although the amount to which a customer is able to offset their energy needs depends on the particulars of each project. Generally, the customer-generator will still need to purchase some amount of electricity from the utility and also will rely on a utility's power in the event the on-site generation is interrupted. It also is common for these customer-generators to produce excess power intermittently, above and beyond their own energy demands. In this situation excess power is exported back to the grid, via the interconnection, and becomes available to customers at large. This give and take between utility and customer-generator is what gives rise to net metering, due to the exchange of power between the two generating entities.

At its most basic, a net metering program allows a customer-generator to export power back to the grid when output exceeds the customer-generator's usage. In return for the exchange of their excess power generation the customer-generator receives, or earns, a rate of credit. This rate of credit is set at the same rate that the customer-

[6] *Id*.

generator would pay to purchase energy from the utility as a normal consumer.[7] With this structure, the customer-generator is able to offset his/her own energy usage and also provide power back to the grid to help meet a utility's energy load.

For the connected utility, the overall costs of the net metering program consist of the rate credits given to the customer-generators plus the administrative costs associated with running the overall program.[8] In practice, however, the utility will be able to offset much of these costs through benefits derived from operation of the on-site generation facility. The utility can avoid the costs associated with generating the same amount of energy that it would have had to produce to meet energy demand if not for the excess customer-generated energy exported into the grid.[9]

All of these unique costs and benefits associated with the interconnection of a customer-generator's on-site facilities into the utility's electrical grid must be considered when setting the rate structure for these types of utility customers. The regulatory trend, however, seems to be that utilities are creating unfair, skewed rate structures for these customer-generators. Rate structures that do not account for the benefits provided by the distributed generation created from on-site generation facilities. Additionally, some utilities are charging standby charges on customer-generators that do not adequately reflect the true cost of providing service on the part of the utilities. This regulatory environment has led to numerous rate disputes and challenges before state utility regulatory commissions.

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[7] Commonwealth of Virginia, State Corporation Commission, Case No. PUE-2011-00088, Direct Testimony and Exhibits of R. Thomas Beach on Behalf of the Maryland - District of Columbia – Virginia Solar Energy Industries Association (Oct. 11, 2011) at 7 (hereinafter "Beach testimony).
[8] *Id*.
[9] *Id*.

The Virginia Standby Charge Case

One of the more recent and decisive rate disputes arose out of an application for approval of a standby charge from Dominion Virginia Power ("Dominion") applicable to residential solar generation facilities between 10 and 20 kilowatts.[10] In July of 2011, Dominion submitted its application to the State Corporation Commission ("the Commission") for approval of a standby charge and submitted a proposed methodology applicable to eligible residential customer-generators.[11] Dominion's application was submitted in accordance with Virginia Code § 56-594, which sets forth the regulations related to net energy metering in the Commonwealth of Virginia.[12] Net energy metering is defined under the regulation as the measured difference between the electricity supplied to an eligible customer-generator from the electric grid and the electricity generated by the customer-generator that is fed back into the electric grid.[13]

Under § 56-594, the Commission is tasked with establishing requirements for net energy metering and ensuring that any requirements so established do not adversely affect the public interest.[14] An eligible customer-generator, for purposes of net metering, is a customer that

> owns and operates, or contracts with other persons to own, operate, or both, an electrical generating facility that (i) has a capacity of not more than 20 kilowatts for residential customers and 500 kilowatts for nonresidential customers…; (ii)

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[10] Commonwealth of Virginia, State Corporation Commission, Case No. PUE-2011-00088, Application of Virginia Electric and Power Company for approval of a standby charge and methodology and revisions to its tariff and terms and conditions of service pursuant to § 56-594 F of the Code of Virginia (July 29, 2011) at Section II, paragraph 7 (hereinafter, "Application").
[11] *Id*.
[12] Va. Code § 56-594, *Net Energy Metering Provisions*
[13] Va. Code § 56-594(B).
[14] Va. Code § 56-594(A), stating "The regulations may include, but need not be limited to, requirements for (i) retail sellers; (ii) owners and/or operators of distribution or transmission facilities; (iii) providers of default service; (iv) eligible customer-generators; of (v) any combination of the foregoing, as the Commission determines will facilitate the provision of net energy metering, provided that the Commission determines that such requirements *do not adversely affect the public interest*." (emphasis added).

> uses as its total source of fuel renewable energy…; (iii) is located on the customer's premises and is connected to the customer's wiring on the customer's side of its interconnection with the distributor; (iv) is interconnected and operated in parallel with an electric company's transmission and distribution facilities; and (v) is intended primarily to offset all or part of the customer's own electricity requirements."[15]

In 2011, the Virginia General Assembly enacted House Bill (HB) 1983, which amended Va. Code § 56-594.[16] HB 1983 expanded the definition of "eligible customer-generator," as presented in the previous paragraph, and added a Subsection F that authorized an energy supplier to charge a standby charge to customer-generators.[17] Under the statute, the Commission was vested with final approval of a supplier's proposed standby charge and was directed to approve such a charge if "it finds that the standby charges collected from all such eligible customer-generators allow[s] the supplier to recover *only the portion of the supplier's infrastructure costs that are properly associated with serving such eligible customer-generator*."[18] Infrastructure costs are generally divided into three broad areas: distribution, transmission and generation.[19]

These types of customer-generators interconnect with a utility's electrical system and receive credit for any electricity generated on-site and fed back into the electrical grid.[20] The balance of any excess electricity generated by the customer-generator may be

[15] Va. Code § 56-594(B).
[16] Chapter 239 of the 2011 Acts of Assembly, An Act to amend and reenact § 56-594 of the Code of Virginia, relating to electric energy; net energy metering, [H 1983], March 18, 2011.
[17] Va. Code § 56-594(F).
[18] *Id*. (emphasis added).
[19] Commonwealth of Virginia, State Corporation Commission, Case No. PUE-2011-00088, Application of Virginia Electric and Power Company for approval of a standby charge and methodology and revisions to its tariff and terms and conditions of service pursuant to § 56-594 F of the Code of Virginia (July 29, 2011) at Section II, paragraph 7 (hereinafter, "Application").
[20] Commonwealth of Virginia, State Corporation Commission, Case No. PUE-2011-00088, Direct Testimony and Exhibits of Virginia Electric and Power Company (Oct. 3, 2011) at 3 (hereinafter "Dominion Testimony).

carried over into the following twelve-month net metering period, but not further.[21] In its application, Dominion claimed that the cost of service for net metering customer-generators was no different than the cost of service for non-net metered customers.[22]

Furthermore, Dominion recognized in its application that it would derive some benefit from customer-generators in terms of costs avoided in connection with transmission, distribution and generation.[23] Interestingly, however, Dominion proposed transmission and distribution charges but then stated that "because of the need to gain more experience with net metering installations over 10 kilowatts" it was not prepared to determine specific generation-related charges in its application.[24] Dominion did not explain how it had sufficient knowledge and experience to determine distribution and transmission charges but did not possess the same amount of knowledge to determine an appropriate generation charge. Indeed, third-party comments submitted in the case raised questions on the sufficiency of Dominion's application based on the need to further study the effects of net metering installations.

Benefits Derived from Distributed Generation

As previously mentioned, on-site, residential solar installations have the ability to offset the customer-generator's energy demand while providing excess energy to the electrical grid. In the Dominion case, however, it appears that the utility's application only considered the costs of these distributed generation facilities and not the benefits derived from them. Comments submitted by the Virginia Alternative and Renewable

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[21] *Id*.
[22] Application at 4.
[23] *Id*. at 3-5.
[24] *Id*.

Energy Association ("VAREA") pointed out that the proposed standby charge and methodology did not account for any benefits derived from distributed generation.[25] Avoided utility generation costs are the principal benefit of distributed generation, but there are many and varied ancillary benefits as well. Such ancillary benefits may come in the form of distribution system planning and cost deferral, increased grid reliability and security, enhanced Clean Air Act compliance and achievement of regional climate change policy goals, and economic development opportunities for renewable energy generation.[26]

Distributed generation, including residential solar arrays, can enable connected utilities to avoid certain maintenance and supply costs. Utilities benefit from customer-generators because of reduced grid line losses, a decline of certain capacity costs, and avoided fuel costs.[27] Whether the amount of cost avoided in each of these areas will be minimal or substantial depends on the particular operational characteristics of an individual utility.[28] A distributed generation facility can also "contribute to peak demand reductions where the productive hours of a [distributed generation] system correlate to the system peak demand."[29] On-site distributed generation from net-metered solar facilities shaves peak load demand, especially when considered in the aggregate.[30]

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[25] Commonwealth of Virginia, State Corporation Commission, Case No. PUE-2011-00088, Comments of the Virginia Alternative and Renewable Energy Association (October 26, 2011) at 3 (hereinafter "VAREA comments").
[26] *Id*.
[27] Commonwealth of Virginia, State Corporation Commission, Case No. PUE-2011-00088, Comments of the Interstate Renewable Energy Council (October 26, 2011) at 5 (hereinafter, "IREC comments").
[28] IREC comments at 5.
[29] *Id*.
[30] *Id*. at 4.

Through these savings utilities can reduce the need to rely on inefficient and expensive peaker generation facilities during high-energy demand periods.[31] Utilities will also be able to lengthen the life of aging infrastructure and "defer capital-intensive upgrades and replacement of distribution and transmission assets."[32] Additional avoided costs could come from reduced use of transmission and distribution lines that would have been used to deliver "like" power from larger, more remote conventional generation sources to the distribution feeder.[33] Additionally, a thorough analysis of the costs and benefits of net metering will take into consideration the useful life of the on-site facility, which can be between 20 and 25 years for residential solar generation installations.[34]

Excess power exported to the grid from these customer-generators will most likely be consumed by nearby loads on the same circuit.[35] Net metered distributed generation installations between 10 kilowatts and 20 kilowatts are located on lower-voltage secondary distribution systems, meaning they will not stress the high-voltage distribution systems.[36] By enabling this type of distributed generation, a utility can avoid the transmission losses associated with moving power from remote generation facilities to that feeder.[37] This amounts to an 8% avoided loss from transmission and distribution for this secondary distribution system.[38]

Avoided distribution costs are somewhat complex to determine, but not impossible. On-site, distributed generation facilities still require distribution costs, such

[31] *Id*.
[32] *Id*.
[33] Beach testimony at 7-8.
[34] *Id*. at 8.
[35] *Id*. at 11.
[36] *Id*.
[37] *Id*. at 12.
[38] *Id*.

as transformers, service drops and metering.[39] Costs related to distribution investment are also not necessarily avoided for the lower-voltage portion of the distribution grid, which is typically sized to the end-use customers' non-coincident peak demands.[40] Studies have shown, however, that customer-generator loads placed on the distribution system are more diverse than those of conventional customers and correlate with peak loads on distribution circuits.[41] Additionally, the higher voltage portions of the distribution grid peak at times that are similar to system peak, meaning that a distributed generation peaking resource, such as on-site residential solar generation, can avoid costs to cover these peak loads.[42]

In its third-party comments to the Dominion standby charge approval case, the Interstate Renewable Energy Council ("IREC') highlighted Dominion's failure to include benefits derived from residential customer-generation activity.[43] IREC asserted that this failure resulted in a violation of Subsection F of Virginia's net metering regulations.[44] IREC argued that the proposed standby charge would collect more than "the portion of the supplier's infrastructure costs that are properly associated with serving such eligible customer-generators" as required in the code language.[45]

As set forth in its application, Dominion claims that the cost of service for net metering customer-generators is no different in number than the cost of service from non-

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[39] Beach testimony at 13.
[40] *Id*.
[41] *Id*. at 13, citing a Southern California Edison study; *See* SCE's GRC Phase 2 testimony, Exhibit SCE-04, pp. 68-71 (CPUC Application No. 11-06-007, available at http://docs.cpuc.ca.gov/published/proceedings/A1106007.htm).
[42] *Id*. at 14.
[43] IREC comments at 3.
[44] *Id*.
[45] IREC comments at 3, citing Va. Code § 56-594(F).

net metered customers.[46] This assumed equation of cost of service ignores the tendency for solar to provide on-site generation that offsets on-site consumption during peak usage hours. By helping to ease the burden of increased generation need during peak hours, on-site generation provided by net metered renewable generation can help prevent the overheating and inefficient performance of a more stressed grid.[47]

The underlying assumption that renewable customer-generators grant no benefit in savings, in the form of a decreased cost of service, to the utility skews the entire rate structure presented in Dominion's application. In essence, the Application does not allow for customer-generators to benefit from saving the utility money. In its comments, SEIA pointed out that the application of these standby charges ultimately produces a "much higher relative cost allocation on the customer who is actually benefiting the overall grid with their [distributed generation] system."[48] With this kind of unfair treatment, it is not hard to understand why a potential customer-generator would be wary to install a 10+ kilowatt solar generating facility on his/her property.

Commission's Decision on Approval of Standby Charge

In its order of November 23, 2011, the Commission ultimately approved the standby charge proposed by Dominion in its application.[49] Finding that the record indicated that net metered customer-generators still make use of a utility's transmission and distribution grid, the Commission approved the standby charge methodology that

[46] Application at 4.
[47] IREC comments at 3.
[48] Commonwealth of Virginia, State Corporation Commission, Case No. PUE-2011-00088, Direct Testimony and Exhibits of MD DC VA Solar Energy Industries Association, Direct Testimony and Exhibits of Francis Hodsoll (Oct. 11, 2011) at 8 (hereinafter "Hodsoll testimony").
[49] Commonwealth of Virginia, State Corporation Commission, Case No., Final Order on Application of Virginia Electric and Power Company (Nov. 23, 2011), electronic copy available through a docket search at http://docket.scc.virginia.gov/vaprod/main.asp.

included the transmission and distribution components proposed by Dominion.[50] The final order found that the grid must be available to residential generators in order to deliver power when solar generation failed and in order to return excess power produced by the resident to the grid.[51] In addition, the Commission agreed with Dominion that "any avoided cost benefits provided by customer-generators, at least in terms of the transmission and distribution grid, are insufficient to pay for their proportionate share of the grid."[52]

Interestingly, in approving the standby charge, the Commission did not approve a generation component of the charge and instead put in a placeholder. This decision was due to the fact that Dominion failed to present sufficient data to satisfy the statutory requirements for a generation rate component.[53] This insufficiency in data, however, did not keep the Commission from rejecting the application as a whole, even though the regulations require the Commission to ensure that "only the portion of the supplier's infrastructure costs that are properly associated with serving such eligible customer-generator" are recovered through a standby charge.[54] It would seem that without sufficient data related to the cost and benefits of net metering, the Commission is not able to ensure that a utility will not over-recover through its standby charge.

In response to the Commission's decision, the MD-DC-VA Solar Energy Industries Association ("MDV SEIA") filed a petition for reconsideration of the

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[50] *Id*. at 3.
[51] *Id*.
[52] *Id*. at 4.
[53] *Id*.
[54] Va. Code § 56-594(F).

Commission's approval of Dominion's standby rate and methodology.[55] SEIA asked the Commission to reconsider two parts of the Order that "(1) approve the proposed methodology of [Dominion] without consideration of the generation components of the standby charge rate; and (2) set forth the timing of the effectiveness of the resulting standby charge rates."[56] MDV SEIA contended that by allowing Dominion to determine if, and when, to include a generation component in its standby charge inappropriately impacts the customer-generators.[57] According to MDV SEIA, by allowing Dominion to exclude the generation component from its calculations, the Commission ignored the substantial avoided costs associated with the generation component.[58] This result, SEIA claimed, means that Dominion will over-recover its infrastructure costs.[59]

In the end, the Commission's decision did not change in light of the petition for reconsideration.[60] The Commission reiterated its finding that "there were no 'quantifiable benefits provided by eligible customer-generators to apply to the methodology.'"[61] Without recognizing the danger posed by allowing a utility to decide when it would determine how much benefit was derived from power provided by the customer-generator, the Commission expressed its faith that Dominion would collect a year's worth of data in relation to the generation component in order to calculate the eventual number

[55] Commonwealth of Virginia, State Corporation Commission, Case No. PUE-2011-00088, Petition for Reconsideration of Commission Final Order by the MD DC VA Solar Energy Industries Association (Dec. 13, 2011) (hereinafter "Petition for Reconsideration"), electronic copy available through a docket search at http://docket.scc.virginia.gov/vaprod/main.asp.
[56] *Id*. at 1.
[57] *Id*. at 4.
[58] *Id*. at 5.
[59] *Id*.
[60] Commonwealth of Virginia, State Corporation Commission, Case No. PUE-2011-00088, Order on Reconsideration (Jan. 17, 2012), electronic copy available through a docket search at http://docket.scc.virginia.gov/vaprod/main.asp.
[61] *Id*. at 1.

that will be incorporated into the standby charge.[62] This result creates an unclear regulatory and economic environment for any potential customer-generator.

Approaches Used In Analyzing Net Metering Programs

One of the most common tests used when determining costs of net metering is the "ratepayer impact measure" ("RIM") test.[63] The RIM test measures the impact of a behind-the meter program on non-participating ratepayers.[64] Along with the RIM test, Virginia and other states sometimes use a broader "societal" or "total resource cost" test as another way of determining whether or not to implement energy efficiency or demand response programs.[65] These types of tests balance the societal costs of saving energy against the broader societal benefits and not just the avoided costs for the utility system.[66] Societal costs associated with saving energy are principally the total cost for the participant to install energy-saving measures in addition to any utility-funded incentives to participate. A total resource cost analysis does not consider the impacts of the lost revenue to the participating utility.[67]

In its comments, IREC contended that the proposed standby charge violated the fundamental "maxim of utility regulation that customers should be responsible for the costs the utility incurs to provide service."[68] When setting utility rates, utilities must

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[62] *Id*. at 2.
[63] Beach testimony at 10.
[64] National Action Plan for Energy Efficiency (2008). *Understanding Cost-Effectiveness of Energy Efficiency Programs: Best Practices, Technical Methods, and Emerging Issues for Policy-Makers*. Energy and Environmental Economics, Inc. and Regulatory Assistance Project, explaining available at http://www.epa.gov/cleanenergy/documents/suca/cost-effectiveness.pdf, which explains RIM analysis as a "comparison of administrator costs and utility bill reductions to supply-side resource costs."
[65] Beach testimony at 10.
[66] *Id*.
[67] *Id*.
[68] IREC comments at 2, citing *Freeing the Grid*, 2010 edition at pp. 27-8.

ensure that the rates accurately reflect costs incurred as a result of servicing customers while "avoiding discrimination and unjustified cost shifting between customer classes."[69] Generally, utilities bear the burden of demonstrating that their rates are cost justified through cost-of-service studies. Ideally, these cost-of-service studies should include examinations into the customer-generator's operational characteristics, average load factor, and contribution to system peak.[70]

Interestingly, Dominion uses a standard cost-effectiveness balancing test when it determines the cost and benefits of both its energy efficiency program and demand response program.[71] The costs and benefits of net-metered distributed generation are very similar to those derived from demand response programs.[72] Solar distributed generation adds energy supply of peaking generation behind the customer's meter while demand response reduces the customer's demand during peak afternoon hours.[73] Dominion's analysis of its energy efficiency and demand-side programs use both the RIM and the total resource cost tests as the primary form of measurements for cost-effectiveness of those programs.[74] Dominion also should use these tests when analyzing the costs and benefits of a net metering program. If Dominion made a more complete assessment of the net metering program, by combining a RIM test with a total resource cost test, it

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[69] *Id*., citing Bonbright, James C., *et al*., *Principles of Public Utility Rates*, Public Utility Reports, Inc. 1988 at pp. 109-10.
[70] *Id*. citing *Standby Rates for Customer-Sited Resources*: *Issues, Considerations, and the Elements of Model Tariffs*, Final Report for the United States Environmental Protection Agency Developed by the Combined Heat and Power Partnership (Dec. 2009), Appendix B at B-5.
[71] Beach testimony at 9, citing The Company's (Dominion's) *2011 Integrated Resource Plan* (2011 IRP).
[72] *Id*. at 9.
[73] *Id*.
[74] *Id*. at 11.

would likely conclude that the program is cost-effective from a societal, total resource perspective.[75]

Effects of Standby Charges on Economic Viability of Renewable Energy Generation

The need for alternative forms of electric generation is ever-growing and in increasing demand. Facilitating development of this type of generation should be a top priority in the nation and for each state. Customer-generators must make substantial investments in order to install generation facilities, like a residential solar unit. Before making such a large commitment, potential customer-generators are careful to consider whether or not they will be able to offset their own need to purchase energy from a utility and achieve savings on their utility bill.[76]

A potential customer-generator generally calculates various economic components of a solar project before deciding to move forward. These components include the discounted cash flow or net present value, an investment rate of return and a payback analysis.[77] In the case of photovoltaic generation systems, cash flows come in the form of net energy savings and revenue from the sale of Renewable Energy Credits (RECs).[78]

Thus, the type of unfair standby charge approved in Virginia has a strong chilling effect. By creating a disincentive for investment, an arbitrarily high standby charge can impeded and even potentially halt implementation of small-scale residential solar generation development. Without further development and experimentation with the

[75] *Id*. at 10.
[76] *Id*. at 5.
[77] Hodsoll testimony at 6-7.
[78] *Id*.

incorporation of distributed generation net-metered facilities into the utility grid, it will be harder for distributed generation proponents to gather data demonstrating substantial cost-of-service savings to utilities with geographically diverse installations of renewable distributed energy.

As presented in Dominion's expert testimony and exhibits, the standby charges result in a 25% reduction in bill savings for a 20 kilowatt system and reduction of 24% of bill savings for a 12 kilowatt system.[79] This amount of reduction in energy savings virtually eliminates the economic value for many of these solar generation systems.[80] Even the most basic of cash flow models can illustrate how a reduction in savings of these magnitudes can transform "a positive [net present value] project into a significantly negative [net present value] project."[81]

Analyzing the approach of other jurisdictions to standby charges helps to illustrate the benefit of taking a careful approach when setting rate structures. For example, a utility in New Mexico applied for a standby charge that sought to recover the fixed cost of providing service to both net metering and non-net metering customers.[82] After completing a cost-of-service study, the New Mexico utility found that the benefits of distributed generation outweighed the fixed costs imposed by the distributed generation system.[83] Although the standby charge recognized the benefits of distributed generation,

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[79] *Id*. at 7; *See also* Dominion Testimony, Schedule 2.
[80] *Id*.
[81] *Id*., *See also* note 3, which also explains how "Net Present Value analysis estimates the future cash flows accruing to the investment; discounts these cash flows using a rate of return commensurate to the risk associated with receiving these estimated cash flows; and sums these cash flows to calculate the Present Value of these estimated cash flows. This PV calculation of the estimated cash flows is then compared to the [PV] of the capital investment. If the [NPV] is positive – the PV of the cash flows accruing to the investment is greater than the PV of the investment – the project is deemed economic."
[82] New Mexico Public Regulation Commission Docket UT-10-00086.
[83] IREC comments at 6.

it did not allocate those benefits on a one to one basis with costs.[84] Ultimately, the New Mexico case resulted in a settlement agreement between the parties and a withdrawal of the utility's proposed standby charge and flawed methodology.[85]

For many who support the growth of renewable energy generation in this country, standby charges are seen as a way for conventional utility generators to stymie this growth. The Virginia Alternative and Renewable Energy Association (VAREA) pointed out in its comments that the economic benefits of a residential solar generation facility would decline by about two-thirds with the implementation of Dominion's standby charges.[86] As further evidence of the negative economic impact caused by the standby charge, the VAREA provided an example from one of its members involved in the residential solar generation market. This member estimated that, even without the standby charge, a 20 kilowatt on-site residential generation facility would have a very low internal rate of return. With the implementation of the standby charge, the internal rate of return decreased to almost zero.[87] Clearly, with an internal rate of return of almost zero, very few, if any, residential customers would buy a solar array.

For any capital-intensive investment, the payback period of the investment becomes very important for the potential investor. When the standby charges are applied to residential solar generation facilities, the payback period for investment in the facility increases by five years.[88] Although five years may not necessarily be a deal-breaker for larger investment entities, waiting an additional five years for repayment of an

[84] *Id*.
[85] *Id*.
[86] VAREA comments at 4.
[87] *Id*.
[88] IREC comments at 6.

investment has the potential to become a large deterrent for would-be residential customer-generators.

Historically, customers with extremely large loads were the major investors in on-site generation facilities in order to offset the bulk of their electric utility purchases. These type of large facilities, which are usually thermal energy combined heat and power plants ("CHP"), place a much larger burden on the utility than that of a small residential customer-generator.[89] If a large CHP plant went offline, the local utility must be prepared to make up for the large loss in generation capacity that may be needed at any time.[90]

The differences between these large plants and the type of residential solar installation envisioned in the Dominion standby case are varied and many. Residential small-scale solar generators generally have small loads and are more diverse than industrial or commercial energy customers.[91] For a variable load facility, such as a solar photovoltaic system, there is no longer a need for a utility to "standby" in case the system goes offline.[92] The variability of solar generation also means that those customer-generators will have a continued need to purchase power from the utility when generation supply is unavailable.[93]

Furthermore, because a utility can predict when certain alternative energy will be unavailable, it can plan accordingly. It cannot be said that a utility is truly standing by during those times, but rather acting as sole provider of generation. During these times of unavailability, the customer-generator pays for the use of the distribution system in the

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[89] *Id.*
[90] *Id.*
[91] *Id.* at 7.
[92] *Id.*
[93] *Id.*

same way as a conventional residential customer.[94] Although standby charges are appropriate for larger, on-site customer-generators, careful analysis is needed when determining these charges for smaller projects to ensure they are not set higher than needed to comply with the relevant regulations.

Conclusion

The need for an increased supply of electricty is one of the most crucial problems facing the United States. With an ever warmer climate this need will grow, and meeting this higher energy demand will become more difficult. Ensuring that our energy policies and utility rate structures evolve in a way that supports a growing renewable energy market is necessary for success in meeting rising energy demands. On-site residential solar generation has the potential to help bridge the energy gap while lowering the amount of carbon dioxide emitted into the atmosphere by dirtier, conventional methods of generation. Additionally, the distributed generation created through wide spread implementation of this type of customer-generator technology will help protect against large power failures and assure greater energy reliability.

Market growth in small-scale renewables will not be possible unless regulations and policies are structured to support participation in these types of projects. Although utilities may be reticent to help develop technologies that could eventually drive down their own sales and business, entities in charge of regulating utility rates must lead the way in ensuring that barriers to development are not created through unfair rate schemes. Thorough analysis of the effects of interconnecting these types of facilities is needed in

[94] IREC comments at 7.

order to create rates that adequately reflect the costs and benefits of these installations to utilities. By balancing costs and benefits on a one to one ratio, customer-generators will be able to invest in capital-intensive projects with the assurance that their investment will be economically viable. Unfair standby charges, like those allowed in the Dominion case, must be avoided if we are ever to move forward in development of this much needed customer-generator market.