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COMMONWEALTH OF VIRGINIA
STATE CORPORATION COMMISSION

Staff Report and Proposed Rules

Ex Parte: In the Matter of Establishing Regulations for Net Energy Metering Pursuant to Va. Code § 56-594

Case No. PUE990788

December 22, 1999

INTRODUCTION

The Virginia Electric Utility Restructuring Act (the Act) became effective on July 1, 1999. By design, the Act profoundly changes the way Virginians may obtain their electricity in the future. While the main emphasis of the Act is to offer choice in energy suppliers, it also grants new rights to customers that own small wind, solar and hydro generating facilities that are intended primarily to offset all or part of a customer's electricity requirements. Specifically, Section 56-594 of the Code of Virginia allows customers owning a wind, solar or hydro generating facility to interconnect with the utility's electrical grid and receive credit for excess generation by virtue of net metering. Net metering means that when a customer's generator is producing more electricity than the customer's load is demanding, the excess is fed back into the utility grid and the customer receives credit for his excess generation.

Section 56-594 of the Code of Virginia requires that the Commission establish by regulation a net metering program to begin no later than July 1, 2000. The statute states that the Commission's "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; or (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." Section 56-594 also specifies additional requirements that must be embodied in the Commission's regulations. These include:

1) metering equipment installed for net metering shall be capable of measuring the flow of electricity in two directions, and shall allocate fairly the cost of such equipment and any necessary interconnection;

2) generating systems shall meet all applicable safety and performance standards established by the National Electrical Code (NEC), the Institute of Electrical and Electronics Engineers (IEEE), and accredited testing laboratories such as Underwriters Laboratories (UL);

3) net metering customers shall bear the cost, if any, as determined by the Commission, to (i) install additional controls, (ii) perform or pay for additional tests, (iii) purchase additional liability insurance; and

4) minimum requirements for contracts to be entered into by parties to net metering arrangements, with such requirements protecting customers from discrimination.

In this report, Staff is proposing regulations that it believes will facilitate net energy metering. Staff's proposed regulations are attached to this report as Attachment A. In addition, Staff's proposed regulations are contained in pages 5-18 of this report, along with discussion concerning the rules.

BACKGROUND

In arriving at its proposed regulations pertaining to net energy metering, Staff conducted numerous meetings with net energy metering stakeholders affected by Section 56-594. In addition, in July of 1999, Staff mailed an informal questionnaire to about 70 interested parties. These parties included all electric utilities operating in the state, various associations representing the wind, solar and hydro industries, numerous universities in the Commonwealth, as well as several solar panel manufacturers and installers. Staff has received responses representing the views of 28 parties. These responses are included in this report as Attachment B.

In addition, Staff co-sponsored with the Virginia Department of Mines, Minerals and Energy a workshop concerning interconnection and net energy metering. The workshop was held on September 30, 1999, at Old Dominion Electric Cooperative's headquarters in Glen Allen, Virginia. Present at the workshop were representatives from most electric utilities in Virginia, as well as wind, solar and hydro proponents, municipal utilities, and numerous state agencies. Speakers included: 1) Bill Brooks, a member of the Institute of Electrical and Electronics Engineers (IEEE) workgroup which is preparing IEEE P929 – a recommended practice for the interconnection of small photovoltaic systems with the utility grid; 2) Tom Starrs, a principal in Kelso Starrs & Associates, LLC, a consulting firm specializing in the design, analysis and implementation of legal and regulatory incentives for the development of renewable energy technologies, particularly solar and wind energy; and 3) Dr. John T. Bzura, a principal engineer at New England Power Service Company. As a long time researcher in customer-owned technologies, and manager of New England Electric Photovoltaic Research and Demonstration Projects since 1987, Dr. Bzura brought a wealth of practical knowledge and experience to the workshop.

Currently thirty states including Virginia have either laws or regulatory commission regulations pertaining to net energy metering. Three other states have net energy metering matters pending either before their state legislature or regulatory commission. A table summarizing this activity is attached to this report as Attachment C. In addition, there have been two Congressional bills introduced that address net energy metering on a national level. On September 24, 1999, Representative Jay Inslee of Washington introduced H.R. 2947 entitled the "Home Energy Generation Act." This bill is concerned solely with net energy metering. Also, Representative Joe Barton of Texas introduced H.R. 2944, a comprehensive bill intended to

promote competition in national electricity markets, which included provisions for net energy metering.

STAFF DISCUSSION

The provisions governing net energy metering contained in the Act identify four potential parties to a net energy metering transaction: retail sellers, owners and/or operators of distribution or transmission facilities, providers of default service, and net metering customers. The Act states that the Commission's regulations may impose requirements on all or a combination of these parties, "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." In Staff's opinion this is the guiding principle for the Commission to follow in developing requirements for parties to net energy metering. Black's Law Dictionary defines "facilitate" as "to free from difficulty or impediment." Staff believes that the Commission's regulations pertaining to net metering should make interconnecting a solar, wind or hydro generating facility to the electrical grid as simple as possible, while remaining mindful of safety concerns.

Staff appreciates the input provided by the net energy metering stakeholders that have participated in our process of information gathering. Many of the concerns they expressed have been reflected in the development of our regulations.

STAFF'S PROPOSED REGULATIONS

The following are Staff's proposed net metering regulations. In cases where Staff's proposed regulations merely incorporate the specific requirements of Section 56-594, often there is no Staff comment. Where Staff's proposed regulations reflect Staff's judgment concerning matters that Section 56-594 leaves to the discretion of the Commission, Staff provides accompanying commentary.

VIRGINIA STATE CORPORATION COMMISSION
REGULATIONS GOVERNING NET METERING

20 VAC 5-315-10. Applicability and scope.

These regulations are promulgated pursuant to the provisions of § 56-594 of the Virginia Electric Utility Restructuring Act (§ 56-576 et seq. of the Code of Virginia). They establish requirements intended to facilitate net energy metering for customers owning and operating an electrical generator that uses as its total fuel source solar, wind or hydro energy. These regulations will serve to standardize the interconnection requirements for such facilities and will govern the metering, billing and contract requirements between net metering customers, electric distribution companies and energy service providers.

As required by the Section 56-594, Staff's proposed regulations are designed to facilitate the provision of net energy metering in a manner such as to not adversely affect the public interest. The Act requires that the net energy metering program begin no later than July 1, 2000. While the Commission can begin the program earlier, Staff believes the time requirements associated with a formal rulemaking proceeding will not allow the program to begin earlier. Moreover, at the time of this report's drafting, Staff is unclear what changes, if any, the legislature will make to the current net metering laws during the 2000 legislative session. Any such changes would be expected to become effective on July 1, 2000. Since the preparation of the final version of the regulations contained herein must be completed prior to July 1, 2000, any

legislative changes might have to be accommodated by revisions to these regulations, if the Commission is unable to incorporate such changes in its final regulations.

As noted earlier, Section 56-594 identifies four potential parties to a net metering transaction: retail sellers, owners and/or operators of distribution or transmission facilities, providers of default service, and net metering customers. The Act states that the Commission may impose requirements on all or 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."

It is Staff's position that the Commission's regulations must, as a principal feature, define the electric distribution company's obligations, because the physical interconnection the net metering customer makes will be with the local electric distribution company. The Commission regulations should also impose requirements on all retail sellers of electricity, including competitive suppliers and default service providers, in order to enhance net metering opportunities. In addition, Staff is proposing certain requirements be imposed upon net metering customers. Staff's proposed requirements for each of these parties are discussed below.

<u>20 VAC 5-315-20. Definitions.</u>

Staff has based its proposed definitions on those found in Section 56-594. Often Staff has used different definitions and terms for purposed of clarity. For those definitions that Staff proposes changing, Staff will explain why it believes the changes are appropriate.

The following words and terms when used in this chapter shall have the following meaning unless the context clearly indicates otherwise:

"*Billing period*" means, as to a particular customer, the time period between the dates on which the electric distribution company or energy service provider, as the case may be, issues the customer's bills.

This definition reflects Staff's position that participation in the net metering program should not affect the frequency of customer billing. In some states, such as California, net metering customers are billed only once per year. Currently, most customers in Virginia receive monthly bills and some receive bi-monthly bills. Staff is unaware of any reason for altering the billing schedule.

"*Electric distribution co*mpany" means the company that owns and/or operates the distribution facilities delivering electricity to the net metering customer's premises.

Code Section 56-594 states that the Commission may develop requirements for owners and/or operators of distribution or transmission facilities. Regardless of who is supplying energy to a net metering customer, that customer will have to interconnect with the electric distribution company's electrical grid. Therefore, the Commission's regulations should establish requirements that govern this relationship.

"*Energy service provider*" means the company providing electric energy to a net metering customer, either on a tariffed, competitive, or default basis.

Until the generation portion of the electric business is deregulated, customers will continue to receive electrical service on a bundled tariffed basis. After the generating portion of the electric business becomes competitive in Virginia, customers will have to choose an energy service provider or take default service. Therefore, Staff believes that the Commission's regulations should establish requirements for all energy service providers, including tariffed energy service providers, default service providers and competitive energy service providers.

"*Net metering customer*" means a customer owning and operating a renewable fuel generator under a net metering service arrangement.

This definition incorporates the definition of "eligible customer-generator" from Section 56-594, but uses the regulation's now separately defined term "renewable fuel generator."

"*Net metering period*" means each successive 12-month period following the date of final interconnection of the renewable fuel generator with the electric distribution company's facilities.

"*Net metering service*" means measuring the difference, over the net metering period between electricity supplied to a net metering customer from the electric grid and the electricity generated and fed back to the electric grid by the net metering customer, using a single meter.

The definition used for purposes of these regulations is identical to the definition of net energy metering in Section 56-594 B. except that Staff has added the words "using a single meter." This is to clarify Staff's position that the Act does not require more than one meter for net metering service[1]. Staff discusses reasons for this position in more detail under Regulation 20 VAC 5-315-50, Metering, Billing and Tariff Considerations.

"*Renewable fuel generator*" means an electrical generating facility that:

1. Has a capacity of not more than 10 kilowatts for residential customers and not more than 25 kilowatts for non-residential customers;

2. Uses as its total fuel source solar, wind, or hydro energy;

3. Is owned and operated by the net metering customer and is located on the customer's premises;

4. Is interconnected and operated in parallel with the electric distribution company's facilities; and

5. Is intended primarily to offset all or part of the customer's own electricity requirements.

Staff's definition for renewable fuel generator incorporates from the statute the requirements included in the statute's definition of an "eligible customer-generator."

With regard to the fifth requirement, there was some discussion at the September 30, 1999, workshop concerning the requirement that a renewable fuel generator be intended to

[1] Although Staff's position is that the Act requires no more than a single meter, customers would be permitted to install additional meters at their option, as discussed in 20 VAC 5-315-70.

primarily offset all or a part of the customer's own electricity requirements. The issue was how the Commission's regulations would ensure that a customer's renewable fuel generator was, in fact, not intended to generate in excess of the customer's own requirements. Staff believes that the economics associated with renewable fuel generators will discourage potential net metering customers from sizing a system beyond what is needed to meet their own electrical consumption. The installation costs associated with these systems are very high; so much so that a net metering customer who is effectively receiving the utility's full retail rate for his generation will still likely not recover the total cost of producing the electricity. Another disincentive to oversizing a system is the fact that, under the net energy provision in the Act, the net metering customer is not compensated for excess generation at the end of the net metering period (absent a purchase power contract). Therefore, in Staff's opinion there are ample constraints in the Act, and the economics associated with this technology, to be reasonably sure that customers will not oversize their systems.

20 VAC 5-315-30. Company notification.

The prospective net metering customer shall submit a notification form to the electric distribution company and, if different from the electric distribution company, the energy service provider, at least 14 days prior to the date the customer intends to interconnect his renewable fuel generator to the electric distribution company's facilities. A net metering customer shall have all equipment necessary to complete the grid interconnection installed prior to such notification. The electric distribution company shall have 14 days from the date of notification to determine whether the requirements contained in 20 VAC 5-315-40 have been met. A notification form is attached to these regulations as Appendix A.

Fifteen days after a net metering customer submits the interconnection form, he may interconnect his renewable fuel generator, and begin operation of said renewable fuel generator, unless the electric distribution company or the energy service provider requests a waiver of this requirement under the provisions of 20 VAC 5-315-80, prior to said 15th day.

The electric distribution company shall file with the Commission's Division of Energy Regulation a copy of each completed notification form within 30 days of final interconnection.

Staff's position is that all prospective net metering customers must notify both their electric distribution company and their energy service provider of their intent to interconnect a renewable fuel generator. At the workshop, it appeared that all parties agreed that, at a minimum, the incumbent utility should be notified before interconnection occurs. Until retail competition is fully implemented in Virginia, a customer's electric distribution company and energy service provider may be the same company. In such instances, notification given to the incumbent utility would serve both purposes.

<u>20 VAC 5-315-40. Conditions of interconnection.</u>

A. A prospective net metering customer may begin operation of his renewable fuel generator on an interconnected basis when:

1. The customer has properly notified both the electric distribution company and energy service provider (in accordance with 20 VAC 5-315-30) of his intent to interconnect;

2. The customer has certified that his installed renewable fuel generator meets all provisions of all applicable safety and performance standards established by local and national electrical codes including the National Electrical Code, the Institute of Electrical and Electronics Engineers, and Underwriters Laboratories, or other national testing laboratories;

3. The inverter settings have been checked by the electric distribution company for renewable fuel generators exceeding a generating capacity of 10 kW;

4. The customer has complied with the electric distribution company's current interconnection guidelines for non-static inverter generators;

B. A prospective net metering customer shall not be allowed to interconnect a renewable fuel generator if doing so will cause the total rated generating capacity of all interconnected renewable fuel generators within that customer's electric distribution company's service territory to exceed 0.1% of that company's Virginia peak-load forecast for the previous year.

C. Neither the electric distribution company nor the energy service provider shall impose any charges upon a net metering customer for any interconnection requirements specified by this chapter.

The Act requires that renewable fuel generators meet all applicable safety and performance standards established by the National Electrical Code (NEC), the Institute of Electrical and Electronics Engineers (IEEE), and accredited testing laboratories such as Underwriters Laboratories (UL). The National Fire Protection Association publishes the NEC. An entire chapter of the NEC, Article 690, deals with the wiring and installation of photovoltaic systems. The guiding document for UL with respect to photovoltaic systems is UL 1741. Specifically, UL 1741 deals with testing procedures for photovoltaic inverters and charge controllers. The guiding document for IEEE related to photovoltaics is IEEE P929. (Currently a draft standard, IEEE P929, is being finalized). IEEE P929 covers recommended practices for interconnecting a photovoltaic system to a utility grid. It is important to note that once the new IEEE P929 and UL 1741 are formally adopted,[2] a grid-tied PV system that meets the NEC will also meet the requirements of both UL 1741 and IEEE P929, because the 1999 NEC Article 690 requires the use of UL listed equipment, and any inverter that meets UL 1741 must meet the requirements of IEEE P929.[3]

In terms of interconnecting a renewable fuel generator, the Act also states that the Commission may require net metering customers to pay for additional tests and controls. Staff does not believe that there is any benefit in requiring additional tests or controls for inverter-connected renewable fuel generators. Based on Staff's review of documents related to inverters

[2] IEEE 929 is expected to be formally adopted in January of 2000. Inverter manufacturers then have 6 months to implement UL 1741 standards.

[3] Larsen, Chris, *Photovoltaics and the Utility Grid, A Non-Technical Guide To PV Interconnection Issues*, Second Edition 1999.

common on photovoltaic systems, Staff believes that inverters meeting the requirements of IEEE P929 and that are UL listed provide a sufficient degree of protection to utilities' personnel and facilities, and other utility customers, as well persons and property at the net metering customers' premises. While IEEE P929, UL 1741 and NEC 690 are focused primarily on photovoltaic systems, the safety aspect of these standards relate to the performance of static inverters. In Staff's opinion, as long as a small hydro or wind generating system has a static inverter in place that meets the requirements of IEEE P929, UL 1741 and NEC 690, no other controls or tests should be necessary. All evidence seems to indicate that static inverters, at a minimum, provide all the protection necessary for systems rated 10 kW or less. For systems rated between 10 kW to 50 kW, however, there may be instances where additional controls are necessary. IEEE P929 states that:

> This recommended practice applies to utility-interconnected PV power systems operating in parallel with the utility and utilizing static (solid-state) inverters for the conversion of dc to ac. (This recommended practice does not apply to systems utilizing rotating inverters.) This document describes specific recommendations for small systems (rated at 10 kW or less), such as may be utilized on individual residences. … Intermediate size applications, ranging from over 10 kW up to 500 kW, follow the same general guidelines as small systems. (P929, Draft 10, February 1999, Page 7, 1.1 Scope))
>
> It is the intent of this recommended practice that small systems designed and installed in accordance with this document and other applicable standards, such as the National Electrical Code (NEC), will require no additional protective equipment.

Virginia Power, in its response to Staff's informal data requests states that:

> Most if not all of these generating units being sold come as a package with adequate protective relaying and switching devices included. The need for additional relay and switching devices will be rare but may be required, depending on the generator's size and its ability to back-feed our system during undesirable conditions.

Delmarva Power & Light Company and Allegheny Power, in their responses to Staff's informal data request, made comments similar to those of Virginia Power.

Thomas J. Starrs, responding on behalf of a coalition of renewable energy organizations stated in his responses to Staff's informal data request that:

> Although the Act limits eligibility for net metering to systems sized 10 kW or smaller (for residential customers) or 25 kW or smaller (for commercial customers), we note that the IEEE P929 standard governing the interconnection of photovoltaic systems has no such size limits, although it does allow some variation for larger systems. Specifically, systems under 10 kW have completely standardized settings for the inverter (the power conditioning unit that serves as the interface between the customer's generating facility, the customer's loads, and the utility network). The corresponding UL 1741 standard establishes a testing procedure intended to operate in parallel with P929 to ensure that the inverter complies with P929. If the inverter passes the UL 1741 test, then the UL will list the equipment and the utility simply needs to check for UL listing without performing any additional testing or independent verification. For systems above 10 kW, IEEE P929 maintains the same standards but provides some flexibility with allowable voltage settings, to reflect the fact that the local utility may have some system-specific constraints that justify voltage settings at variance with the standard settings.

Hence, it is Staff's opinion that renewable fuel generator installations exceeding 10 kW in capacity and having static inverters, should adhere to the provisions of NEC 690, IEEE 929 and UL 1741 and should further be subject to the review by the electric distribution company permitted by Rule 20 VAC 5-315-40 A. 3. at no cost to the net metering customer. Any net metering customer intending to interconnect a renewable fuel generator not having a static inverter should be subject to the electric distribution company's current interconnection requirements until such time as a Virginia standard for such generators is developed as

contemplated in Virginia Code Section 56-578 D[4]. (IEEE P1547, currently under development, may offer guidance concerning non-inverter generators.)

The installation of a manual lock-out device on the utility side of the meter is an additional control that most utilities seemed to support as a reasonable safety requirement. Based on discussions at the September 30, 1999 workshop and other evidence Staff has gathered, Staff is not convinced that such a device is necessary as long as the net metering customer's static inverter meets all applicable performance and safety standards. Moreover, the same protection and visible indication functions afforded by a manual lock-out device can be obtained by removing the customer's meter, if necessary.

20 VAC 5-315-50. Metering, billing and tariff considerations.

Net metered energy shall be measured in accordance with standard metering practices by metering equipment capable of measuring (but not necessarily displaying) power flow in both directions. Each contract or tariff governing the relationship between a net metering customer, electric distribution company and/or energy service provider shall be identical, with respect to the rate structure, all retail rate components, and monthly charges, to the contract or tariff under which the same customer would be served if such customer was not a net metering customer. Said contract or tariff shall be applicable to both the electric energy supplied to, and consumed from, the grid by that customer.

If electricity generated by the customer and fed back to the electric grid exceeds the electricity supplied to the customer from the grid ("negative net consumption") during a net metering period, the customer shall receive no compensation from the electric distribution company nor the energy service provider unless that net metering customer has entered into a purchase power contract with the electric distribution company and/or the energy service provider.

During any billing period for which a net metering customer has a negative net consumption, the customer shall be required to pay only the non-usage sensitive charges for that month. Such negative net consumption shall be applied against future energy consumption, but not past the end of the net metering period.

[4] § 56-578 D. states that the Commission shall consider developing a standardized permitting process and interconnection arrangements for power systems less than 500 kW, which have demonstrated approval from a nationally recognized testing laboratory acceptable to the Commission.

The Act requires that the Commission establish minimum requirements for contracts to be entered into by parties to net metering arrangements. Staff does not believe a formal written contract between a net metering customer and the electric distribution company or energy service provider is necessary. On a revenue basis, in most, if not all, instances, the installation of a renewable fuel generator will be similar to the case of a customer replacing electrical appliances with more energy efficient ones, or taking other measures to reduce electricity consumption.

The Act also states that such requirements shall protect net metering customers against discrimination by virtue of being a net metering customer. Simply placing the net metering customer on the tariff or contract he would have been on, absent net metering, should provide the necessary protection against discrimination.

According to some utilities at the workshop, the Act can be interpreted to require two meters -- one to measure the flow of electricity into the customer's house and one to measure the flow of electricity fed back to the grid by the customer. Staff does not agree with this interpretation. The Act states that the meter installed for net metering shall be capable of measuring the flow of electricity in both directions. A standard watthour meter is capable of measuring electricity flows in two directions.

Participants at the workshop raised concerns about subsidies embedded in net metering service if only one meter is used. Moreover, most utility responses to Staff's informal data request referenced a subsidy. The argument, for example, is that a net metering customer may consume 1000 kWh of electricity from the grid in a given month and feed back into the grid 300 kWh. The customer will be billed for only 700 kWh of electricity, thus receiving transmission and distribution service applicable to 300 kWh for free. A way of eliminating this subsidy would be to require two meters so that the utility could credit only the avoided cost to the customer's

bill. However, the net metering provision in the Code calls for "net metering" which implies, in Staff's view, full retail credit, not avoided cost credit.

Moreover, in Staff's opinion renewable fuel generation technology offers environmental benefits both within and beyond the borders of the Commonwealth of Virginia. However, it is difficult, if not impossible, to quantify that benefit. As noted above, some would argue that the use of a single meter will give net metering customers a subsidy. However, even if this is true, this subsidy may be an appropriate means of supporting and promoting an environmentally benign type of electrical generation.

In Staff's view, the subsidy argument is diminished when one considers the fact that the electricity fed back into the grid by net metering customers will flow through other customers' meters. In these instances the utility will collect a full retail price for this electricity from these other customers. Moreover, there may be times when a utility is buying energy on the spot market at rates exceeding the average retail rate of its net metering customers. At these times, the net metering customer could be said to be "subsidizing" the utility.

Readers of this report should be mindful that the Act places a limit on the potential size of this program. It is Staff's belief that participation in this program will not soon, if ever, rise to the 0.1% of peak load limit, due primarily to the high cost of renewable fuel generators. At the workshop, Dr. Bazura from Massachusetts Electric stated that his company has been actively promoting the use of photovoltaics on its systems for a number of years. Despite this, he stated that his company currently has only about 85 net metering customers, even though a net metering statute has been in place since 1981. Therefore, it is hard to believe that Virginia's net metering program will be larger than that in Massachusetts anytime soon.

As noted earlier, in most instances, from a revenue basis, the installation of a renewable fuel generator will be no different than an electricity customer replacing an electrical appliance with a more efficient one. Therefore, for illustrative purposes Staff will make some assumptions in order to show the potential impact this program may have on utilities in Virginia. If we assume that 85 Virginia Power customers each install photovoltaic systems with a generating capacity of 2 kW, an upper limit on Virginia Power's lost revenue could be calculated as follows: Staff has been informed by a solar industry representative that a 2 kW solar panel located in Central Virginia can be expected to produce about 2,200 kWh of electricity annually. Assuming that the solar panels of 85 customers do indeed produce at this level, they will produce 187,000 kWh of electricity annually in total. At Virginia Power's average retail rate of 8.08 cents per kWh for 1998, the annual lost revenue to the Company will be $15,110.

20 VAC 5-315-60. Liability insurance.

Net metering customers shall not be required to obtain additional liability insurance as a condition of interconnecting with the electrical grid.

The Act states that net metering customers shall bear the costs, if any, as determined by the Commission, to purchase additional liability insurance. It is Staff's opinion that the safety aspects contained in NEC 690, IEEE P929, and UL 1741 assure reasonable electrical safety for small photovoltaic systems. Moreover, this conclusion should be extended to small hydro and wind systems that output through a static inverter. Further, we have proposed in Rule 20 VAC 5-315-40, that all inverter systems above 10 kW and all non-inverter systems be subject to more stringent requirements. Therefore, Staff recommends against a Commission-mandated liability insurance requirement.

<u>20 VAC 5-315-70. Additional controls and tests.</u>

No net metering customer shall be required to pay for additional metering, testing or controls in order to interconnect with the electric distribution company or energy service provider. However, this chapter shall not preclude a net metering customer, an electric distribution company or an energy service provider from installing additional controls or meters, or from conducting additional tests. The expenses associated with these additional meters, tests and/or equipment shall be borne by the party desiring the additional meters, tests and/or equipment.

As noted earlier, Staff does not believe that there is any benefit in requiring additional tests or controls for inverter-connected renewable fuel generators. Therefore, net metering customers should not be required to bear the cost of these additional items unless such customer elects to install additional meters, controls or to perform additional tests on his own accord.

<u>20 VAC 5-315-80. Request for waivers.</u>

Any request for a waiver of any of the provisions of this chapter shall be considered by the Virginia State Corporation Commission on a case-by-case, and may be granted upon such terms and conditions as the Commission may impose.

ATTACHMENT A

CHAPTER 315.

REGULATIONS GOVERNING NET METERING.

20 VAC 5-315-10. Applicability and scope.

These regulations are promulgated pursuant to the provisions of § 56-594 of the Virginia Electric Utility Restructuring Act (§ 56-576 et seq. of the Code of Virginia). They establish requirements intended to facilitate net energy metering for customers owning and operating an electrical generator that uses as its total fuel source solar, wind or hydro energy. These regulations will serve to standardize the interconnection requirements for such facilities and will govern the metering, billing and contract requirements between net metering customers, electric distribution companies and energy service providers.

20 VAC 5-315-20. Definitions.

The following words and terms when used in this chapter shall have the following meaning unless the context clearly indicates otherwise:

"*Billing period*" means, as to a particular customer, the time period between the dates on which the electric distribution company or energy service provider, as the case may be, issues the customer's bills.

"*Electric distribution co*mpany" means the company that owns and/or operates the distribution facilities delivering electricity to the net metering customer's premises.

"*Energy service provider*" means the company providing electric energy to a net metering customer, either on a tariffed, competitive, or default basis.

"*Net metering customer*" means a customer owning and operating a renewable fuel generator under a net metering service arrangement.

"*Net metering period*" means each successive 12-month period following the date of final interconnection of the renewable fuel generator with the electric distribution company's facilities.

"*Net metering service*" means measuring the difference, over the net metering period between electricity supplied to a net metering customer from the electric grid and the electricity generated and fed back to the electric grid by the net metering customer, using a single meter.

"*Renewable fuel generator*" means an electrical generating facility that:

1. Has a capacity of not more than 10 kilowatts for residential customers and not more than 25 kilowatts for non-residential customers;

2. Uses as its total fuel source solar, wind, or hydro energy;

3. Is owned and operated by the net metering customer and is located on the customer's premises;

4. Is interconnected and operated in parallel with the electric distribution company's facilities; and

5. Is intended primarily to offset all or part of the customer's own electricity requirements.

20 VAC 5-315-30. Company notification.

The prospective net metering customer shall submit a notification form to the electric distribution company and, if different from the electric distribution company, the energy service

provider, at least 14 days prior to the date the customer intends to interconnect his renewable fuel generator to the electric distribution company's facilities. A net metering customer shall have all equipment necessary to complete the grid interconnection installed prior to such notification. The electric distribution company shall have 14 days from the date of notification to determine whether the requirements contained in 20 VAC 5-315-40 have been met. A notification form is attached to these regulations as Appendix A.

Fifteen days after a net metering customer submits the interconnection form, he may interconnect his renewable fuel generator, and begin operation of said renewable fuel generator, unless the electric distribution company or the energy service provider requests a waiver of this requirement under the provisions of 20 VAC 5-315-80, prior to said 15th day.

The electric distribution company shall file with the Commission's Division of Energy Regulation a copy of each completed notification form within 30 days of final interconnection.

20 VAC 5-315-40. Conditions of interconnection.

A. A prospective net metering customer may begin operation of his renewable fuel generator on an interconnected basis when:

1. The customer has properly notified both the electric distribution company and energy service provider (in accordance with 20 VAC 5-315-30) of his intent to interconnect;

2. The customer has certified that his installed renewable fuel generator meets all provisions of all applicable safety and performance standards established by local and national electrical codes including the National Electrical Code, the Institute of

Electrical and Electronics Engineers, and Underwriters Laboratories, or other national testing laboratories;

3. The inverter settings have been checked by the electric distribution company for renewable fuel generators exceeding a generating capacity of 10 kW;

4. The customer has complied with the electric distribution company's current interconnection guidelines for non-static inverter generators;

B. A prospective net metering customer shall not be allowed to interconnect a renewable fuel generator if doing so will cause the total rated generating capacity of all interconnected renewable fuel generators within that customer's electric distribution company's service territory to exceed 0.1% of that company's Virginia peak-load forecast for the previous year.

C. Neither the electric distribution company nor the energy service provider shall impose any charges upon a net metering customer for any interconnection requirements specified by this chapter.

20 VAC 5-315-50. Metering, billing and tariff considerations.

Net metered energy shall be measured in accordance with standard metering practices by metering equipment capable of measuring (but not necessarily displaying) power flow in both directions. Each contract or tariff governing the relationship between a net metering customer, electric distribution company and/or energy service provider shall be identical, with respect to the rate structure, all retail rate components, and monthly charges, to the contract or tariff under which the same customer would be served if such customer was not a net metering customer.

Said contract or tariff shall be applicable to both the electric energy supplied to, and consumed from, the grid by that customer.

If electricity generated by the customer and fed back to the electric grid exceeds the electricity supplied to the customer from the grid ("negative net consumption") during a net metering period, the customer shall receive no compensation from the electric distribution company nor the energy service provider unless that net metering customer has entered into a purchase power contract with the electric distribution company and/or the energy service provider.

During any billing period for which a net metering customer has a negative net consumption, the customer shall be required to pay only the non-usage sensitive charges for that month. Such negative net consumption shall be applied against future energy consumption, but not past the end of the net metering period.

20 VAC 5-315-60. Liability insurance.

Net metering customers shall not be required to obtain additional liability insurance as a condition of interconnecting with the electrical grid.

20 VAC 5-315-70. Additional controls and tests.

No net metering customer shall be required to pay for additional metering, testing or controls in order to interconnect with the electric distribution company or energy service provider. However, this chapter shall not preclude a net metering customer, an electric distribution company or an energy service provider from installing additional controls or meters,

or from conducting additional tests. The expenses associated with these additional meters, tests and/or equipment shall be borne by the party desiring the additional meters, tests and/or equipment.

20 VAC 5-315-80. Request for waivers.

Any request for a waiver of any of the provisions of this chapter shall be considered by the Virginia State Corporation Commission on a case-by-case, and may be granted upon such terms and conditions as the Commission may impose.

Effective 7/2000

INTERCONNECTION NOTIFICATION

PURSUANT TO COMMISSION REGULATION 20 VAC 5-315-30, APPLICANT HEREBY GIVES NOTICE OF INTENT TO INSTALL AND OPERATE A GENERATING FACILITY.

Section 1. Applicant Information

Name: _____

Mail Address: _____

City: _____ State: _____ Zip Code: _____

Facility Location (if different from above): _____

Daytime Phone #: _____

Distribution Utility: _____ Account # : _____

Energy Service Provider (ESP) _____ Account # : _____
(if different than Distribution Utility)

Section 2. Generating Facility Information

Generator Type (check one): Solar _____, Wind _____, Hydro _____

Generator Manufacturer, Model Name & Number: _____

_____ Power Rating in Kilowatts: _____

Inverter Manufacturer, Model Name & Number: _____

_____ Battery Backup? (yes or no) _____

Section 3. Installation Information & Certification

☐ Check if owner-installed

Installation Date: _____ Interconnection Date: _____

Installing Electrician: _____ License #: _____

Mail Address: _____

City: _____ State: _____ Zip Code: _____

Daytime Phone #: _____

1. The system hardware is listed by Underwriters Laboratories to be in compliance with UL 1741:

Signed (Vendor): _____ Date: _____

Name (printed): _____ Company: _____

2. The system has been installed in compliance with the local Building/Electrical Code of _____
(City/County)

Signed (Inspector): _____ Date: _____

In lieu of signature by inspector, a copy of final inspection certificate may be attached.

3. Utility and ESP signatures signify only receipt of this form, in compliance with the Commission's net energy metering regulations, Regulation 20 VAC 5-315-30.

Signed (Utility Representative): _____ Date: _____

Signed (ESP Representative): _____ Date: _____

I hereby certify that, to the best of my knowledge, all of the information provided in this Notice is true and correct.

Signature of Applicant _____