www.pse.com

PUGET SOUND ENERGY
The Energy To Do Great Things
Puget Sound Energy, Inc.
P.O. Box 97034
Bellevue, WA 98009-9734

Filed via WUTC Electronic Webportal

July 15, 2011

Mr. David W. Danner
Executive Director and Secretary
Washington Utilities and Transportation Commission
1300 South Evergreen Park Drive S.W.
P.O. Box 47250
Olympia, WA 98504-7250

Subject: **Docket No. UE-110667**

Study of the Potential for Distributed Energy in Washington State

Comments of Puget Sound Energy, Inc.

Dear Mr. Danner:

Puget Sound Energy, Inc. ("PSE") appreciates the opportunity to participate in the Commission's conduct of a study relating to development of distributed energy in areas served by investor-owned electric utilities. In response to the Commission's Notice of Opportunity to File Written Comments dated June 24, 2011, in Docket No. UE-110667, PSE offers the following overview and comments on the List of Issues and Questions.

OVERVIEW

Distributed generation ("DG"), solar in particular (perhaps with storage), provides electric customers a scalable and available choice of supply from a self-controlled, clean energy source. It may also for the first time provide customers the ability to meet their vehicle transportation fuel need "at home', thus granting them independence from long-time reliance on fossil fuels.

The cross-over issues among power and transportation sectors have now moved well beyond clean air standards to fundamental changes in long-accepted business models. DG technology now presents the traditional integrated utility with the potential to evolve a new relationship with its customers while opening up other opportunities. Technological advances and business model evolution may also present new operational challenges for the grid and may well require development of new regulatory practices to address cost recovery and sharing of distribution system costs.

For distribution systems with relatively high retail rates, solar has already arrived as an economically competitive alternative to grid purchases. As DG costs continue to decline and as costs to renew and expand the distribution system steadily increase, more utilities and their customers will discover that DG has arrived at "grid parity". These companies and their regulators will need to anticipate and eventually address the loss of load and system operations issues these new technologies present.

Accordingly, distributed generation holds the potential to become a disruptive innovation and opportunity for these reasons:

- Provides an available supply option to customers;
- Potential to become a new line of business for utilities;
- Potential to decrease demand for utility-supplied energy;
- Potential to aggravate under-recovery of rising fixed T&D costs and exacerbate utility under-earning;
- Potential, like Energy Efficiency, to find its way into building code requirements and other legal obligations;
- Potential to embed other service providers and vendors in the retail electric supply chain (without engaging the retail access policy issues);
- Potential to create linkages between electric vehicle ("EV") use and the avoidance of gasoline consumption;
- Potential to deliver further cost declines through technology advancement and manufacturing innovation; and
- Potential to be linked with emerging storage technology to expand applications and improve cost effectiveness, including as a transportation fuel.

PSE RESPONSE TO LIST OF ISSUES AND QUESTIONS

A. General – Cross-Cutting Issues

A.1. What is the scope of current and anticipated distributed energy in the service territories of Washington's investor-owned utilities, including technology type, size and capacity; distribution across service territory; application of feed-in tariffs or net-metering; and any other relevant information? For each technology, what is its total technical resource potential (in contrast to the present, economically viable potential)? Is it concentrated within the state?

PSE Response: The technical and market potential of these technologies is best answered by private consultants with access to a myriad of data and market knowledge. Sources such as the "Renewable Energy Atlas of the West" offer some useful data. Subjects that merit consideration include, but are not limited to, residential solar, commercial solar, distributed storage systems, biomass, biogas, micro-hydro, wind, and fossil fuel gensets. PSE defines "distributed" by power generation capability -- up to 5 MW can be interconnected to the distribution grid or substations at 35 kV or less. Utilities such as San Diego Gas & Electric that have a large amount of DG penetration also can provide valuable information about DG penetration, use and management. Matters such as interconnection standards and code compliance, dispatch control, and peak demand value become an important part of the DG dialogue. PSE is in the early stages of studying the benefits and costs of pursuing and expanding distributed generation opportunities within our service territory

A.2. What is, or what is anticipated to be, the overall cost of integrating distributed energy resources to investor-owned utilities?

PSE Response: Integration costs fall into two general categories: interconnection costs; and system integration costs. Interconnection costs are primarily a function of the size of the resource, the existing load on the line the distributed generation resource will feed into, and the safety equipment that is integrated into the resource.

Integration of residential solar is not material since the equipment includes a UL 1741 listed inverter. UL 1741 standards are based on IEEE 1547 which was developed over many years to allow distributed solar systems to put electricity back on a circuit that was designed for power flow in only one direction. The key elements of a UL 1741 inverter are to ensure power quality and safety by preventing power flow when the circuit is not energized.

If the distributed generation resource is not UL 1741 compliant, or if the resource is larger than 300 KW, then interconnection requires a series of studies to determine system impact, and to identify necessary measures (WAC 480-108). The studies and the additional equipment can be costly. For a project of 500 KW to 5 MW, PSE estimates that the studies will cost in the range of $25,000 in 2011.

Additional costs come from necessary equipment such as transformers, meters, larger conductors, etc. The cost and cost avoidance effects, if any, of DG, will be dependent upon the types of interconnected technology, their system locations, intermittency characteristics, and overall degree of penetration. PSE's experience with distributed generation interconnections has increased dramatically over the last two years with technologies that include small wind, micro-hydro, dairy digesters, waste-water methane collection and community solar.

In addition to interconnection costs, there are system integration costs associated with incorporating intermittent resources into the grid. Most of our analysis of these kinds of integration costs has focused on wind resources, but we would expect the magnitude to be similar.

A.3. Describe the incentives paid by or through investor-owned utilities. How much is paid annually for each technology?

PSE Response: Currently, for distributed generation projects, PSE pays for the electricity produced and the Renewable Energy Credits when contracted for. PSE provides for net metering, when applicable, under state law. The costs of net metering are paid for by all customers through their general rates.

PSE makes the payment of the state incentive production under WAC 458-20-273. PSE makes these payments directly to qualifying net-metered customers and recoups the cost through state tax reductions.

A.4. Are there changes in state statutes or rules that would encourage technology-neutral development of distributed energy generally, such as changes to financial incentives? For example, would current interconnection standards need to be changed to accommodate more distributed energy or to accommodate different distributed energy technologies? Why?

PSE Response: Financial incentives need to be targeted at specific technologies. In general, if they are technology neutral, the investment dollars tend to flow almost exclusively to where the returns are most lucrative.

In general the interconnection standards were written for safety and reliability. One possible change is to investigate whether the WAC 296-45-335 requirement for a visible disconnect switch could be removed for systems that are UL 1741 protected.

A.5. What storage options exist that could be used to help integrate distributed energy into the electric grid?

PSE Response: On the residential scale, batteries could be used to help integrate variable distributed energy. American Electric Power is currently experimenting with a Community Energy Storage pilot, whose results are forthcoming. On a larger scale, several companies are endeavoring to commercialize larger-scale energy storage options, with capacities ranging from 0.5 to 2.0 MW with 0.25 to 6 hours of discharge capability. Such units are as large as tractor-trailers and could conceivably be deployed at commercial and industrial facilities, at substations, or other strategic locations as space and interconnection feasibility allows. PSE investigated several technologies in detail, including sodium-sulfur (NaS), zinc-bromide (ZBr) flow batteries, advanced lead-acid, and flywheels in detail and concluded that even considering the multiple benefits of T&D upgrade deferral, renewables integration, system reliability, and energy arbitrage, the currently available technologies are not cost-effective at this time. PSE continues to monitor distributed energy storage technology and cost-effectiveness for potential application.

A.6. Do distributed energy technologies impact investor-owned utility rates currently? If so, please describe how and whether rate impacts affect certain customer classes more than others. How might future rates be impacted?

PSE Response: Customer-owned distributed generation creates loss of load and under recovery of fixed costs in much the same way as energy efficiency. At present, this effect is not material to PSE's financial results but could become so as distributed generation penetration rates increase without compensatory regulation. A regulatory mechanism could be designed to mitigate the negative loss of load and revenue effects that distributed generation has on a utilities' ability to recover its fixed costs of rendering service.

As distributed generation penetration rates increase, the issue of system cost shifting to the remaining customers may grow. However, the distribution system we enjoy today was constructed upon the rate model of socialized or rolled-in-rates. It is not clear that the evolution of distributed generation applications yet merits any deviation from such historic rate making practices at this time.

A.7. Do distributed energy technologies meet winter peaking needs for investor-owned utilities? Can distributed energy technologies serve base load capacity? Which distributed energy technologies serve primarily as an hour-ahead or day-ahead energy supply? How can each of the distributed energy technologies and fuel sources contribute to meeting utility peak load needs?

PSE Response: Distributed resources that can be installed and dispatched to support the distribution system during peak times may offer greater value and operating flexibility than those that put power on the grid at will, even in times of energy surplus. Common renewable distributed generation resources such as wind, hydro and solar are all intermittent and hence provide minimal value for capacity or peak needs. Solid fuel resources such as biomass and biogas resources are typically operated as base-load, around the clock, and accordingly, have some known capacity and peak value. Non-renewable distributed generation, such as diesel generator sets, have the advantage of dispatch control, and can be made available when needed.

A.8. If rates or incentives are established at the state level, would it violate or conflict with the federal law provisions in PURPA and the Federal Power Act? For example, if the Commission interprets PURPA to establish a feed-in tariff at the state level, is the Commission obligated by federal law to establish a rate that does not exceed avoided cost?

PSE Response: Issues regarding preemption and conflicts between federal and state laws are generally fact-specific, and thus, difficult to answer in the abstract. Certain state rates or incentives could be found to violate PURPA or Federal Power Act (FPA) provisions. These issues can be complex. Existing avoided-cost standards must be addressed in state programs in a manner consistent with the intent and requirements of PURPA and the FPA. As a case in point, California adopted a feed-in tariff for combined heat and power under Assembly Bill (AB) 1613 in 2007. California utilities challenged such legislation before the FERC. On October 21, 2010, the Federal Energy Regulatory Commission issued a declaratory order—responding to AB 1613—indicating that states do have the flexibility to implement feed-in-tariffs at the state level, but must do so in a manner consistent with the framework of PURPA's avoided-cost provisions. FERC denied rehearing on January 20, 2011. The California Public Utilities Commission is currently considering further utility petitions for modifications that assert that state policy violates PURPA's avoided costs standard. Bills have also been introduced in the U.S. Congress regarding these issues. Accordingly, specific state programs affecting rates must be reviewed for consistency with federal standards.

A.9. Certain statutes and Commission rules require the UTC to review resource acquisition pursuant to least-cost planning. Would pursuing distributed energy conflict with those rules due to the nascent state of technology development and current cost to implement? How far, if at all, should the state depart from least-cost planning principles and rules?

PSE Response: For customers adopting a distributed generation application, they are not making a least cost wholesale electric supply decision. They are making a consumption choice like a home improvement, or an economic choice compared to electric service at all-in grid rates, not wholesale power rates. The key point being, that customers want and are increasingly requesting power supply options that are both clean and economic *to them*. Policies that encourage distributed generation development and adoption should be considered generously until such time as penetration rates help clarify the operational and cost allocation issues proposed to the distribution system. Like energy efficiency, distributed generation is best addressed in the context of loss of load effects and the need to evolve the rate making framework to provide for timely recovery of, and on, distribution system investment and its operating costs.

A.10. If the Commission were to change the avoided cost methodology for certain types of renewable resources, what criteria should we take into account as we do this? Should there be a total cap on the amount of resources to be acquired in this manner, and, if so, state-wide or by utility? Should there be a carve-out for certain technologies that are in a more nascent stage of development now, or should commercially available and emerging technologies be treated equally?

PSE Response: In general, ratemaking practices and policies that encourage alternative energy supply and their retail deployment should be generously considered.

Policies which favor the reduction of reliance on large, environmentally intrusive technology such as conventional nuclear and coal plants and mega hydro projects merit consideration. Such projects have 'long-tail ' liability attributes often unable to be measured and reflected in current rates, but will eventuate as the useful life of such technology comes to an end. Site remediation, decontamination and decommissioning and de-construction costs of such projects will be material. The intergenerational equity issues of such technologies are not insignificant. Emerging distributed generation technologies may harbor fewer such long term costs and risks and their development and application should not be unduly burdened by conventional least cost assessment standards. At present, there is no apparent need to fix caps or impose other arbitrary limits on distributed generation technology use. If the commission were to change the avoided cost methodology for certain types of renewables, we would favor a cap by utility and a specific carve out by technology.

Washington could learn much from the California experience where a variety of policies and financial incentives exist to foster the development of distributed renewable resources cheaper, better, and faster.

A.11. Other policy incentives, both at the state and federal level, already exist for certain types of renewable resources, such as federal grants and state or federal tax benefits. How should these incentives be considered in to the calculation of avoided cost?

PSE Response: Customers adopting distributed generation technology are not evaluating the cost of alternate utility-scale supply options, only the alternative cost of grid power purchases to them. However, were a utility to consider distributed generation as an alternative to energy efficiency or a utility-scale supply option, it would be appropriate that state or federal incentives be included in the calculation of avoided cost, but only if, such distributed generation investments were intended for the utilities general supply portfolio and not limited to a subset of customers who might elect a special tariff providing for a specialized solar service.

A.12. For both capacity and energy, how does the current cost of building distributed energy technology compare with other available resources?

PSE Response:

Table: Levelized energy cost ($/MWh) estimates for various generating technologies. Estimates include applicable Federal and State subsidies.

Technology	Distributed Generation ($ / MWH)	Utility-Scale ($ / MWH)
Wind	$150 - $250	$75-$125
Solar	$400 - $600	$175 - $225
Combined Heat and Power	Unknown; often a "one-off" consideration; complex business models	$100 - $200

In summary, distributed generation technologies in several and ever more numerous jurisdictions, are becoming less costly than grid power purchases by the customer. Distributed generation is becoming an important customer choice. However, at present, most distributed generation applications in the Pacific Northwest are more costly than utility-scale plants in terms of levelized cost. In addition, it is important to note that wind provides very little firm capacity value and solar provides no firm capacity value.

Just as the wireless telephone device eroded the use of wire-based land-based telephone systems, so too might distributed generation reduce dependence on large central generating stations delivered over the ever more costly distribution system.

A.13. What marginal costs are associated with the interconnection requirements for the connection of distributed energy systems? Are those costs material, and how should the costs be recovered (socialized or born by customer-owners of distributed resources)?

PSE Response: For customer-owned distributed generation, the interconnection costs of UL 1741-protected systems is not material to the customer, typically a few hours of time for a qualified electrician. Under state and federal law, the developer/owner of the system who will benefit from the system pays for the costs of interconnection. Related utility administration costs (such as the five employees helping coordinate net metering programs) are currently paid for by all customers per UTC Order in Docket No. UE-990016.

Distributed generation may not save money on the distribution system if the distributed generation has intermittent characteristics and, consequently the distribution system has to be designed to reliably operate when the distributed generation is not generating.

A.14. Should the current statutory restrictions on the size of distributed energy resources be changed? If so, please explain the reasons for the suggested change.

PSE Response: The definition of what constitutes distributed energy resources merits careful consideration before making changes.

If net metering were increased to 300 KW from 100 KW, it would still allow the low-cost interconnection projects. However, this change may not expand the market potential of distributed generation materially since all of the projects in PSE's service territory are typically in the 3-4 KW range, with a few above 20 KW. Accordingly, PSE does not judge the present 100 KW cap to be much of a market limitation. For example, a new school with 350 KW solar is interconnected and utilizing PSE's fixed-offer contract under Schedule 91. A proposed net metering limit greater than 300 KW will encounter more complex and costly issues of safety and power-quality.

A.15. Can each distributed energy resource be used to support emergency management practices in addition to electricity generation?

PSE Response: If PSE has distributed generation facility dispatch capability, then the resource can help with circuit load management practices, and possibly support in an emergency. Solar and wind cannot help because they cannot be "turned on" while biogas and biomass cannot help in an emergency because they are already on.

A.16. Are there other technologies we should consider in addition to wind, solar, hydrokinetic, biomass, and biogas? If so, please identify the technology, the state of development and likelihood of adoption.

PSE Response: The Company believes that the aforementioned list of resources is fairly comprehensive. We also recommend that consideration be given to emerging combined heat and power applications. For example, Honda has developed a natural gas-fired combined internal combustion generator-home furnace combination that can deliver extremely high efficiency heat and power delivery on a distributed scale. Bloom Energy is commercializing a natural gas fuel cell that would deliver both heat and power to businesses and residences, if successful. These types of combined heat and power technologies are in various states of development and commercialization.

B. Technology-Specific Issues

B.1. Not including the photovoltaic solar panels themselves, what is the cost of installation on a unit basis of solar panels in distributed energy applications? How does this compare to the per-unit cost of installation for utility scale applications?

PSE Response: PSE has received several proposals for utility-scale (> 5 MW) solar projects, but these proposals did not specifically identify the various components of installation cost.

PSE recommends referring to the U.S. Department of Energy's white paper "$1/W Photovoltaic Systems: A Grand Challenge for Electricity from Solar," Table 1:

Installed System Price ($/W)

	2010	2016	$1/Watt
Module	$ 1.70	$ 1.05	$ 0.50
BOS/Installation	$ 1.48	$ 0.97	$ 0.40
Power Electronics	$ 0.22	$ 0.18	$ 0.10
	$ 3.40	$ 2.20	$ 1.00

Cost of Energy ($/kwh)

	2010	2016	$1/Watt
Module	$ 0.063	$ 0.037	$ 0.018
BOS/Installation	$ 0.055	$ 0.034	$ 0.014
Power Electronics	$ 0.008	$ 0.006	$ 0.004
O&M	$ 0.013	$ 0.009	$ 0.003
	$ 0.139	$ 0.086	$ 0.038

Table 1: Potential utility scale system cost breakdown to reach $1/watt (note capacity factors assumed are 26% in 2010 and 28% in 2016)

PSE does not have reliable, up-to-date, cost-to-construct data for distributed solar or new central applications. PSE's limited data agrees with the data in Table 1 which show that about one-half of the total cost is for modules, and half for installation and other equipment.

B.2. Is the integration of the variable output of photovoltaic power production made easier or less expensive if it is distributed versus central plant photovoltaic production?

PSE Response: From a system integration perspective, PSE does not anticipate that integration of distributed generation projects will be significantly different than PSE's experience associated with a utility-scale facility. With respect to interconnection, ease of integration will depend on site location and loading of the local distribution system. PSE will experience challenges associated with areas where local substations are close to full capacity. The primary issue is the relative size of the project in comparison to the circuit's ability to absorb the energy through the existing load. For example, if the generator nameplate capability is larger than one-half the minimum load, then a transfer trip would have to be installed, increasing total costs

B.3. Are there lessons learned from Oregon's tariff subsidies for solar installations? Is there a calculated subsidy per kWh for the Oregon program?

<u>PSE Response</u>: In the era of fiscal stress, the Oregon Legislature has determined to reduce solar subsidies by 99 percent, to $3 million from $290 million. Second, one might conclude that initial incentive rates were "too high" based on the high volume of customer interest. The initial offering, when the incentive was about 60 cents per kWh, was promptly subscribed. When the incentive was dropped to about 40 cents, the customer response rate was similar. Oregon has not yet found the rates that will promote steady development of distributed solar.

B.4. Given the variety of tax and other financial incentives for solar manufacturers and consumers, are additional incentives needed?

<u>PSE Response</u>: The answer to these questions depends on what the policy or implementation goals are. It is important to clarify the intent of the incentives. If the intent is to encourage local manufacturing, it probably would be more effective if structured as a direct incentive to the in-state manufacturer. The current arrangement of paying a higher incentive to the end user in the case where locally manufactured products are used, has the tendency of raising the price the consumer, such that most of the incentive value is lost. Since many of the net jobs occur in the installation side, it may be more effective to target incentives at appropriate technologies, regardless of manufacturing location. Generally speaking, if the policy goals are to increase local investment into distributed generation, it would be beneficial to extend and increase state incentives for investment. Uncertainty surrounding renewal of short-term incentives typically creates market and investment inefficiencies. Long-term stability and knowledge of incentives provides investors confidence that they will be able to meet the incentive requirements within the parameters of the timeline.

B.5. Is the integration of the variable output of wind power production made easier or less expensive if it is distributed throughout the service area rather than centralized from a utility-scale wind farm?

<u>PSE Response</u>: The national RTO and ISO experience with wind integration is clear: the larger the area of the balancing authority and the greater its reliance on and use of market mechanisms, the easier and less costly it is to integrate intermittent wind resources. Both the German and the California experience with solar integration suggest distributed technology can be integrated without significant issue.

B.6. What is the estimated contribution of distributed wind generation to meeting a utility's peak demand?

PSE Response: PSE does not expect distributed wind deployment to be of significance, and accordingly, would not expect it to provide system peak capacity. In general, we currently give wind capacity (peak demand) credit at an amount equal to 5% of its nameplate rating for planning purposes at the utility-scale level.

B.7. Does current distribution capacity constrain development of distributed wind generation?

PSE Response: It depends on the characteristics of the distributed wind generation (size, etc.), where it will be located on the distribution system, and other characteristics of the system (e.g., load, other DG's on the same circuit, etc.). Modeling the system helps to review the impacts of distributed wind generation, and will dentify the constraints, if any. System protection, as well as capacity, is also an important design element to ensure a safe and operable generation interconnection.

B.8. What is the state of the technology for generating electricity from wave, tidal, and micro-hydro technologies (maturation, market penetration, retail price of installation)?

PSE Response: Wave and tidal power are still in the experimental or R&D phase. Micro-hydro has been on the increase in 2011; however it has been limited to re-development of old facilities. Building a new dam or water-diversion project would be difficult now due to limited sites and environmental review.

B.9. Do these technologies pose potential negative environmental impacts?

PSE Response: The environmental attributes of all technologies require careful assessment and a balancing of interests. All technologies have environmental impacts. Generally speaking, the environmental impacts need to be assessed in a project-by-project basis, rather than broadly across the technology class

B.10. Are there potential impacts from current environmental regulations for hydroelectric generation that might adversely affect the development of future distributed hydroelectric generation (in other words, should micro-hydro be treated the same as utility-scale hydroelectric generation? Are there other impacts specific to micro-hydro that ought to be considered)?

PSE Response: Micro-hydro potential is limited as a meaningful source of grid supply. However, for unique or one-off applications of a particular customer, micro- hydro might hold some potential value.

B.11. What is the generation capacity and energy production potential from biogas fuels located in Washington State?

<u>PSE Response</u>: A Washington Department of Commerce study on solid waste provides some insight at: (http://www.ecy.wa.gov/pubs/1007031.pdf).

PSE has five dairy digesters under contract with a total of 2.85 MW capacity. Most of the remaining available dairy cow population in the territory resides in Whatcom County with a potential of ten projects of 1 MW each.

PSE has been working with a developer involved in converting municipal green waste to methane-gas energy via anaerobic digestion, but the project is not yet operable. Given the need for a certain level of population within a close proximity to limit transportation costs, we can envision nine such projects at 3 MW each. Problems to address include finding sites and securing green bin contracts.

PSE has two wastewater treatment plants in its service territory which collect methane and produce electricity. The quantities are quite small and the cost of retrofitting a plant can be very expensive, so we do not envision growth in this area.

Landfill gas is another well-known source for biogas, statewide sources would be best suited for information.

Biogas from biomass, such as wood waste, has much potential on a state-wide level. The best technology would be gasification rather than anaerobic digestion. Relevant technologies include NexTerra (http://www.nexterra.ca/technology/index.cfm) and InEnTec (http://www.inentec.com/)

A summary of *Renewable Energy in Washington*, created by the American Council On Renewable Energy (ACORE), can be found at:
http://www.acore.org/files/pdfs/states/Washington.pdf

B.12. How are fuel mixtures accounted for, and are there fuel mixes with fuel components that do not qualify under the state renewable portfolio standard (RCW 19.285)?

<u>PSE Response</u>: Fuel mixtures would be accounted for proportionately. Biogases, produced from biomass either through anaerobic digestion or gasification, are not deemed resources under the RPS; however they should be accorded the same value as landfill gas under RCW 19.285.030.

B.13. What is the range of project capacity sizes for biogas generation resources and how does that compare to the capacity sizes for projects that qualify for published PURPA rates?

<u>PSE Response</u>: PSE has been approached with potential projects as large as 5 MW. The constraints that limit size are the cost of transporting fuel to the site and the cost of interconnection (e.g., the need for a dedicated feeder to the substation).

B.14. What is the status of municipal green stream digester development, including the status of the eligibility of those projects or potential projects under RCW 19.285?

<u>PSE Response</u>: PSE currently has no municipal green stream digester projects operating, nor under construction in its service territory. Current impediments are site control and contracting for long term fuel supply.

<u>C. Financial Incentives</u>

C.1. If the cost of building a distributed energy resource is not yet competitive, and a subsidy is recommended, what form of subsidy is best?

<u>PSE Response</u>: The best subsidies are ones that are provided directly by the state or federal government and do not burden the shareholders nor the ratepayers of utility companies. The policies should not result in one site or one type of utility having a competitive advantage over other utilities.

C.2. What effect would the subsidy have on encouraging the building of the resource versus research and development?

<u>PSE Response</u>: If the intent of the subsidy is to encourage build out, it must be first targeted at technologies that are in the pre-commercial state of development; i.e., the technology risk has been managed or minimized, but mass-market economics have not yet been realized. On this basis, the subsidy must then either enhance shareholder returns in the case of independent developer-owned projects where the competitive price of electricity would otherwise squeeze returns or must lower the cost of electricity to competitive levels in the case of utility-owned projects.

C.3. Should subsidies, incentives or renewable energy credits be paid or created for power generated through distributed resources while market prices are negative?

<u>PSE Response</u>: In order for incentives to be effective they must be as certain as possible. Given that, to the extent such incentives are paid based on production, they should be paid based on actual production and regardless of market electricity prices. The disposition of subsidies and incentives depends on what the contracts have provided for. The renewable energy credits ("REC" or "RECs") as defined in RCW 19.285.030(17) are created whenever renewable power is generated. The market prices at the time a REC is generated and created is irrelevant. RECs exist independent of the market prices at the time.

D. New Issue(s)

D.1. How should the impact of codes be factored in?

PSE Response: Disparity in the application of building codes is emerging as one of the top issues for solar installers. Each municipality can require its own set of building and electrical codes, and these disparities between requirements are emerging as a large administrative burden to the solar installer. It is also proving costly to the home owner. These fees can add upwards of $2,500 to a solar install. There is a growing call to streamline the solar permitting process to cut down on the amount of time and administration that goes into an installation.

PSE appreciates the opportunity to present its viewpoint on these issues and questions and looks forward to further discussions regarding this study. Please direct any questions regarding these comments to Eric Englert at (425) 456-2312 or the undersigned at (425) 462-3495.

Sincerely,

/s/ Tom DeBoer

Tom DeBoer
Director – Federal & State Regulatory Affairs