

## ***Solar Highway Programs Information: Synthesis***

**Prepared for  
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Transportation Synthesis Reports (TSRs) are brief summaries of currently available information on topics of interest to WSDOT staff. Online and print sources may include newspaper and periodical articles, NCHRP and other TRB programs, AASHTO, the research and practices of other state DOTs and related academic and industry research. Internet hyperlinks in the TSRs are active at the time of publication, but host server changes can make them obsolete.

### **Request for Synthesis**

Tonia Buell, Project Development and Communications Manager, in the WSDOT Public-Private Partnerships Office, requested information on Solar Highway Programs. The information is to assist Washington State in the development of a project similar to the [Oregon Solar Highway](#).

- Review Oregon's tax credits and energy grant program used for the demonstration solar project <http://www.oregon.gov/ODOT/HWY/OIPP/docs/BETCoverview2007sept.pdf> and identify the comparable tax structure for renewable energy and solar power generation in Washington State as tax exemptions, credits, incentives for clean-energy projects.
- Conduct research on the various regulations (both state and federal) that would affect the project's financial feasibility such as net metering restrictions.
- Conduct research on available grants and rebates offered through utilities and local, state, and federal agencies.
- Provide map of utility district service boundaries and list of Web sites for five largest Washington utilities.
- Gather information on large solar projects in WA, such as the Teanaway Solar Reserve

### **Databases Searched:**

- TRIS Online
- Research in Progress
- Previous Synthesis Reports
- Google
- Wisconsin DOT Transportation Synthesis Reports
- FTA website
- FHWA website
- Google

**The Oregon Department of Transportation Solar Highway  
ODOT Office of Innovative Partnerships and Alternative Funding Website**  
Project Director: Allison Hamilton – Dec. 2009

Background

The concept of generating solar electricity in the highway operating right of way is of keen interest to solar industry providers, state, and federal elected officials, the Federal Highway Administration, the Oregon Department of Energy and the U.S. Department of Energy. While “roadside solar” has operated successfully for almost 20 years in Europe, it had not been attempted in the United States until the ODOT project. With its commissioning, the Oregon Solar Highway project extends Oregon’s role as a leader in the development of alternative energy resources and showcases the state’s vision and leadership to meet the energy challenges ahead creatively.

Policies and strategies adopted in the Oregon Transportation Plan support this renewable energy project. Policy 4.2 — *Energy Supply* states that it is the policy of the state of Oregon to support efforts to move to a diversified and cleaner energy supply, promote fuel efficiencies and prepare for possible fuel shortages. Strategy 4.2.1 directs ODOT to support efforts to move toward a diversified and cleaner energy supply.

The 2007 Oregon Legislature instituted policies for the state of Oregon to arrest its growth of greenhouse gas emissions by 2010, only one year away. In step with this legislative directive, Oregon Governor Ted Kulongoski directed state agencies to meet their electrical needs with 100 percent renewable resources. Given the constitutional limits on allowable uses of the Highway Fund, this directive proved particularly challenging for ODOT.

Fortunately, innovative financing mechanisms using public-private partnerships are available, which can allow ODOT to secure clean, renewable energy — without paying a premium — from assets it already owns. These public-private partnerships use the 50 percent state Business Energy Tax Credit, the 30 percent federal Investment Tax Credit and utility incentives (available in PGE and PacifiCorp territories) to finance projects, credits which ODOT, having no tax liability, cannot take advantage of on its own.

This financing structure makes it possible for clean, renewable electricity to make real inroads into the energy portfolio offered to consumers in Oregon.

[http://www.oregon.gov/ODOT/HWY/OIPP/inn\\_solarhighway.shtml](http://www.oregon.gov/ODOT/HWY/OIPP/inn_solarhighway.shtml)

**Sacramento Utility Spearheads Solar Highway Project**

Getsolar.com website

Posted by Connie Zheng - January 23rd 2010

Congresswoman Doris Matsui (D-Sacramento) [announced](#) yesterday the U.S. Department of Energy’s allocation of \$5 million in federal stimulus funds to Sacramento Municipal Utility District (SMUD) in order to develop California’s first “[solar highway](#),” as well as [four other](#) renewable energy projects, such as a facilities that compost organic waste to generate energy.

In order to develop this “solar highway,” SMUD plans to take advantage of the unused land along state highways—for example, the terrain near exit ramps—and set up solar panels on this largely ignored territory. Following in the footsteps of Oregon’s own solar highway, which is lined with [594 solar panels](#) that produce nearly 112,000 kilowatt-hours a year and is the first project of its kind in the U.S., SMUD’s own sun-powered thoroughfare is expected to produce 1 MW of energy at peak times. Although information about the beneficiaries of its energy production is forthcoming, Oregon’s own solar highway poses a likely answer: powering highway traffic lights and signs.

<http://www.getsolar.com/blog/sacramento-utility-spearheads-solar-highway-project/3272/>

## **WSU Energy Program**

Website - 2010

WSU Energy Program helps design affordable solar systems through our affiliate the Western Solar Utilities Network (SUN). By choosing renewable energy, you and your customers protect the environment and secure the benefits of energy independence while reducing long-term energy costs. Specialists at the WSU Energy Program can help you decide which energy sources make the most sense for your project, and assist with planning, financing, and permitting of renewable energy projects. Our Climate Change and Rural Energy Development Center offers information to those interested in rural energy projects and the reduction of greenhouse gas emissions.

<http://www.energy.wsu.edu/>

## **Database of State Incentives for Renewables and Efficiencies**

Website - 2010

DSIRE is an online database and a comprehensive source of information on state, local, utility, and federal incentives and policies that promote renewable energy and energy efficiency. Established in 1995 and funded by the U.S. Department of Energy, DSIRE is an ongoing project of the N.C. Solar Center and the Interstate Renewable Energy Council (<http://www.dsireusa.org>). Click on Washington to see the incentive available in our state. Federal incentives are here:

<http://www.dsireusa.org/incentives/index.cfm?State=US&ee=0&re=1>

## **Solar Energy Systems and Semiconductor Incentives**

Washington State Department of Revenue – July, 2009

ESSB 6170 Sections 501 - 503 (Chapter 469, Laws of 2009) amend the business and occupation (B&O) tax rate for manufacturers, manufacturers that sell their product at wholesale, and processors for hire of solar energy systems and specified components of solar energy systems. These sections also expand the sales and use tax exemptions on purchases of gas and chemicals used in manufacturing “semiconductor materials.”

[http://dor.wa.gov/Docs/Pubs/SpecialNotices/2009/sn\\_09\\_SolarEnergy.pdf](http://dor.wa.gov/Docs/Pubs/SpecialNotices/2009/sn_09_SolarEnergy.pdf)

## **Bill to bring new solar energy companies to Washington clears House**

House Democrats Website – March, 2009

OLYMPIA – Clark County freshmen Reps. Tim Probst and Jim Jacks successfully worked a solar-energy jobs bill through the House today. Passing unanimously, the legislation would support renewable energy companies bringing their business and good-paying jobs here.

The renewable manufacturing legislation, House Bill 2130, would provide a business and occupation tax credit for 50 percent of capital funds invested. This credit would max out at \$4 million a year per project, and statewide the credit cannot total more than \$30 million.

The Legislature passed House Bill 3190 in 2006, introduced by Rep. Deb Wallace, D-Vancouver, that provided a package of incentives for semiconductor businesses. Its successes include a recent announcement by SEH America that they'd be expanding up to 1,000 jobs. The Probst-Jacks bill would build on this success and bring the solar industry to Clark County.

[http://housedemocrats.wa.gov/members/probst/20090309\\_solar\\_incentive\\_House.asp](http://housedemocrats.wa.gov/members/probst/20090309_solar_incentive_House.asp)

## **Washington State Legislature Website - 2010**

Title 80 of the RCW (<http://apps.leg.wa.gov/rcw/default.aspx?Cite=80>) and Title 480 of the WAC (<http://apps.leg.wa.gov/wac/default.aspx?cite=480>) apply to utilities.

## **Washington Utilities and Transportation Commission Website**

Net metering for renewable energy systems

Staff contact: Deborah Reynolds – June, 2009

### Background

On June 11, 1998, Substitute House Bill 2773 "Net-metering for certain renewable energy systems" became effective. This law directed electric utilities to make net-metering available to customer generators on a first-come, first-served basis until the cumulative generating capacity of net metering systems equals 0.1 percent of the utilities peak demand during 1996. (See [1999 UTC Staff Report.](#)) On February 10, 1999, the Commission approved "net-metering" rates for Avista, Puget Sound Energy, and Pacific Power & Light which allowed customers who generate their own electricity to receive credits, on a first-come basis, for excess kilowatts generated within a billing period.

In 2000, Engrossed House Bill (EHB) 2334 amended net-metering laws. The main changes introduced by [EHB 2334](#) were:

1. Including fuel cells in the definition of eligible net-metering systems, while maintaining solar, wind, and hydropower as the other eligible fuels for the production of electrical energy.
2. Requiring at least 0.05 percent of the cumulative generating capacity of net-metering systems to come from systems that use solar, wind, or hydropower as their fuel.
3. Forbidding electric utilities to require customer-generators whose systems meet the standards specified by the law to comply with additional safety or performance standards, perform or pay for additional tests, or purchase additional liability insurance; and
4. Declaring that electric utilities are not liable directly, or indirectly, for permitting or continuing to allow attachments of net-metering systems, or for the acts or omission of customer-generators that cause loss or injury, including death, to any third party.

The 2006 legislature amended previous net-metering legislation (chapter [80.60 RCW](#)) in [ch. 201, Laws of 2006](#) (Engrossed Substitute House Bill (ESHB) 2352) which became effective on June 7, 2006. The main changes introduced by this law are:

- Bio-gas from animal waste is now included in the definition of renewable energy. Fuel cells were added to the definition of eligible net metering systems in 2000.
- Increasing the capacity of a net metering electric generation system to not more than one hundred kilowatts.
- Increasing the cumulative generating capacity available to net metering systems to 0.5 percent of the utility's peak demand during 2006 by January 1, 2014. Not less than one-half of the utility's 1996 peak demand available for net metering systems is to be reserved for net metering systems that generate renewable energy.
- Moving the balance date to April 30 each year.

<http://www.wutc.wa.gov/webimage.nsf/8d712cfd4796c8888256aaa007e94b4/1098bcb3d11d349588256715007b32a6!OpenDocument>

## **Federal Energy Subsidies: Not All Technologies are Created Equal**

Renewable Energy Policy Project

Author: Marshall Goldberg – July, 2000

### Executive Summary

*Federal Energy Subsidies* provides a historical accounting of federal government subsidies to nuclear, wind, photovoltaic, and solar thermal electricity generating technologies. Also provided is a less complete accounting of federal subsidies for hydroelectric power. In addition to identifying the actual dollar amounts of the subsidies during the last 60 years, the report offers new insights on how these subsidies have fared relative to each other. A simple message emerges from *Federal Energy Subsidies*: it takes a substantial amount of money, invested over several years, to bring an electricity generation technology to maturity.

This analysis comes at a time when citizens and policymakers alike are debating the environmental impacts of energy use, the role in the American economy of corporate welfare, and appropriate levels of government spending. It provides pertinent information for the ongoing debate regarding the government's influence on energy markets, its support for nuclear power, and, more recently, the notion that renewables are heavily subsidized and receiving preferential treatment.

The report concludes that federal support for nuclear power has far surpassed support for renewables, and that over the long term this public investment correlates with increasing electricity generation by the nuclear sector—although, of course, the increase in nuclear generation reflects several factors in addition to federal investment. From 1943 through 1999, cumulative federal government subsidies to these electricity-generating technologies (excluding hydropower) totaled almost \$151 billion (in 1999 dollars). This figure includes all direct program budgetary outlays, plus several of the most notable off-budget subsidies and policies, including tax credits and incentive payments for renewable energy, as well as nuclear liability limitations. The nuclear industry received \$145.4 billion, or over 96 percent of the subsidies. Those to photovoltaic and solar thermal power accounted for a cumulative total of \$4.4 billion, while wind technology received \$1.3 billion.

Data on early expenditures for hydropower are incomplete. This reflects both the scarcity of archived generation and investment data on hydropower—the development of which began in the 1890s—and the complex historical context of federal hydropower development. In particular, federal hydropower facilities often formed part of larger projects with multiple goals, including flood control, river navigability, regional development, and stimulation of the local and national economies. For this reason, it is difficult to attribute a specific portion of federal investment for power generation. Nevertheless, to assist in further investigations, the figure of \$1.6 billion can be given for a set of straightforward subsidies to hydropower.

Analyses of subsidies during the first 15 years of federal support versus electricity generated reveals surprising differences. Notably, commercial, fission-related nuclear power development received subsidies worth \$15.30 per kilowatt-hour (kWh) between 1947 and 1961. This compares with subsidies worth \$7.19/kWh for solar and 46¢/kWh for wind between 1975 and 1989. In their first 15 years, nuclear and wind technology produced roughly the same amount of energy (2.6 billion and 1.9 billion kilowatt-hours, respectively), but the subsidy to nuclear outweighed that to wind by a factor of over 40, at \$39.4 billion to \$900 million. It may be that this differential contributed to a more mature nuclear sector, as reflected in its much more rapid growth; by 1999, nuclear generation totaled 727.9 billion kWh annually, while wind generation totaled 3.5 billion kWh.

When cumulative subsidies and electricity generation for all years are accounted for (that is, through 1999), subsidies to the development of commercial, fission-related nuclear power results in a subsidy cost of 1.2¢/kWh. This compares with a subsidy cost of 51¢/kWh for solar and 4¢/kWh for wind. As these numbers suggest, greater generation from nuclear power swamps the

greater absolute subsidies to that technology. Again, it seems that larger early investment in nuclear power paid off in subsequent years.

In short, subsidies have played an important role in the development of the technologies examined in the report. The study points to the need to reevaluate energy subsidies in light of larger energy and environmental goals.

[http://www.repp.org/repp\\_pubs/articles/resRpt11/subsidies.pdf](http://www.repp.org/repp_pubs/articles/resRpt11/subsidies.pdf)

## **Renewable Energy Policy Outside the United States**

Renewable Energy Policy Project

Authors: Curtis Moore and Jack Ihle

### Executive Summary

Europe's interest in renewable energy policy seems to go well beyond current U.S. policy. Why? First, it stems from collective environmental concerns, especially for climate change and urban air pollution. In addition, since Europe has fairly modest fossil fuel resources, coal and oil firms hold less political influence than they do in the U.S. Just as important, many electricity suppliers do not generate their own power, and thus have no vested interest in maximizing the use of a particular fuel. The European Union has reinforced individual nation's attitudes with tight emissions standards, policy positions advocating aggressive responses to climate change, and prohibitions on subsidies for fossil fuels.

In Japan, the main impetus for renewable energy development has the pursuit of energy independence, though climate change and the Kyoto Protocol has been added to the Japanese government's list of concerns. Japan has pursued nuclear energy even more vigorously than renewables to meet these needs.

The experiences of the nations discussed in this paper generally point to the ability of concerted policies to spur the domestic installation of renewable energy capacity. Internationally, it appears that those nations with vigorous deployment strategies are capturing greater shares of the world PV market, with Japan and Germany leading the way in shipments. In addition, these nations are driving the global PV market—PV shipments worldwide have clearly responded to their new demand, which are helping to make PV a common commodity and not a high-cost niche product reserved for the space program.

The experiences of industrial nations overseas yields several lessons for the U.S.:

- Examine the successes and failures of other programs.
- Renewable energy technologies cannot currently compete against fossil energy without government subsidies.
- A program of financial assistance must remain stable for at least 10 years.
- Energy independence is a strong driver for renewables overseas.
- Money must flow into and out of a financing scheme in a simple and "transparent" way so that it is clear what is being charged, what is being subsidized, and why.
- Any renewables policy must include non-financial assistance including research, demonstration and development; product testing and certification; resource identification and mapping; and community participation.
- With time, the need for subsidies declines.

[http://www.repp.org/repp\\_pubs/articles/issuebr14/REPOutUS.pdf](http://www.repp.org/repp_pubs/articles/issuebr14/REPOutUS.pdf)

## **Financing Solar Energy in the U.S.**

Solar International Management, Inc

Author: Michael T. Eckhart – August, 1999

## Executive Summary

The financing of solar energy, representing one of the final phases of the process of commercializing solar energy technologies, needs to be addressed as carefully as the previous stages of research, development, demonstration, and commercial utilization. The degree to which solar energy is financeable represents a key measure of its commercialization. Ultimately, the "finance ability" of solar energy will determine the solar market in the U.S.

Policy development for solar energy has been underway for nearly 30 years, since the National Science Foundation and NASA published "Solar Energy as a National Energy Resource" in 1972. Today, leadership for solar market development is coming from the federal government's Million Solar Roofs initiative (MSR), the Utility Photovoltaic Group (UPVG), and several state and local governments. In total, over 200 government programs address or influence the financing of solar energy. Yet, in spite of this attention, solar energy continues to face a finance ability problem.

Because as much as 95% of all solar energy installations will require some form of financing upon purchase, public and corporate policy makers can usefully view the commercialization challenge from the perspective of the lender. In considering whether to lend money for solar technology, financial institutions will assess the likelihood of being repaid, first from the borrower's cash flow and good character (the so-called "ability and willingness" to pay), second, from the solar system's collateral value, and finally, from third-party guarantees. Policies and programs must address those factors to have an impact on market-based lending decisions.

Another urgent issue faces public policy makers. Confusion over technical quality, utility interconnection, safety, economic viability, and insurability actually precludes lenders from making financial determinations. In addition to their impact on potential individual users and solar businesses, these factors harm the broader public interest. The nation's return on its billion-dollar investment in solar panel technology has been delayed by twenty-five years of deliberations over, among other issues, the development and adoption of standards by which users can connect solar systems to the U.S. utility grid.

The solar industries, associations, technical societies, and agencies have undertaken considerable work to address these issues. Based on the review conducted for this paper, it appears that all institutional barriers are resolvable within the next 12 months if there is an across-the-board call for their resolution. This will require joint leadership and commitment. Key issues include: utility interconnection standards; net metering and other regulatory matters; solar system technical, quality, and installation standards; economic and tax incentives on a more permanent basis to encourage appropriate long-term financing of solar energy systems; evaluation criteria for energy-efficient buildings that explicitly accommodate solar electric and solar thermal options; evaluation criteria for lending that incorporate the benefits of solar energy; and consumer guidelines for solar system sizing and performance.

Developing a viable U.S. market for solar energy is a unique challenge. Pro-solar public policy programs in Europe and Japan are valuable benchmarks, but may not be directly applicable in the U.S. American policy must aim to bring the value and cost of the systems to parity; ensure the practicality of the use of the systems through the implementation of standards and guidelines; and support actual financing through government and private sector mechanisms.

The next phase of public policy implementation is charting how the government will become more involved, and then withdraw over time from active intervention in the solar and renewable energy marketplace. The goal is to create a fabric of laws, regulations, rules, practices, procedures, tax treatments, economic incentives, and supporting technology programs that together define a public policy foundation on which the solar energy marketplace can flourish and grow.

This scoping paper, the front-end research for a full policy paper provisionally scheduled for publication in November 1999, includes an introduction, history of solar energy markets in the U.S., assessment of the situation today, description of the role of financing in sustainable markets, catalogue of key issues constraining financing, and a new context (the lender) for development of policy solutions. An appendix includes a valuable and extensive inventory of financing-related programs.

[http://www.repp.org/repp\\_pubs/articles/solFinUS/solFinUS.pdf](http://www.repp.org/repp_pubs/articles/solFinUS/solFinUS.pdf)

## **Clean Government: Options for Governments to Buy Renewable Energy**

Renewable Energy Policy Project

Author: Virinder Sing – April, 1999

### Executive Summary

Government procurement is frequently mentioned as a promising strategy to advance renewable energy in the U. S. There are many good reasons why. Governments can help advance renewables for two reasons. First, they represent the single largest consumer of energy and electricity in the nation. Second, they own a wide array of facilities with different energy needs. Thus, governments can purchase a variety of renewable energy technologies that apply to different energy markets — grid and off-grid power markets, as well as residential, commercial and industrial markets. And since governments span the entire nation, they are uniquely poised to participate in regions with different renewable resource mixes and renewable energy businesses.

Purchasing renewables fulfills several important government roles. Renewables provide greater environmental benefits than more conventional forms of energy. They also generate and keep more dollars in local economies, potentially even many economies that currently rely on the production of fossil fuels. Procurement complements governments' prominent role in research and development, for it advances the technology into the field, with revenues accruing to renewable energy firms essential for product commercialization. Finally, renewables often make fiscal sense for governments — there are a variety of niche market applications for which distributed renewable energy technologies that require little or no fuel, such as solar photovoltaics and small wind turbines, are more affordable than transporting and storing fuel or extending the electricity grid.

However, it is imperative that governments and renewable energy advocates understand that governments alone are small compared to the private market. While it's size is helpful for commercializing renewable energy products already available on the private market, it is not ideal for introducing and propping up technologies that are still too immature for the private market. In short, the government is not an ideal institution to create or encourage an entirely new physical and business infrastructure for a new renewable energy product. Yet given this caveat procurement will help advance many renewable energy technologies as long as three points are kept in mind:

- If government procurement is to make an important contribution to a clean energy future, it has to be one part of a broader effort to commercialize renewables.
- Governments should identify procurement opportunities that build on existing market development efforts and business networks rather than attempting to create an entirely new physical and business infrastructure.
- Government procurement should approximate the dynamics of private markets as much as possible, while bearing in mind that its early involvement also responds to the failure of most private energy suppliers, consumers, and policymakers to make renewable energy a preferred product.

[http://www.repp.org/repp\\_pubs/articles/issuebr12/issuebr12.pdf](http://www.repp.org/repp_pubs/articles/issuebr12/issuebr12.pdf)

### **Top five electric utilities:**

- 1) Puget Sound Energy

<http://www.pse.com>

### **Solar power**

Developing another renewable energy resource

Puget Sound Energy Website

Puget Sound Energy is the largest utility producer of renewable electricity in the Pacific Northwest, including the largest solar facility in the region, located at PSE's Wild Horse Wind and Solar Facility in Kittitas County.

With output of up to 500 kilowatts, the Wild Horse solar project demonstrates the potential for solar power generation in Washington State.

PSE is leading the way with solar generation. On their site they include a video to learn more about this clean, renewable technology being used by builders and homeowners in the Puget Sound region.

[http://www.pse.com/energyEnvironment/energysupply/Pages/EnergySupply\\_ElectricitySolar.aspx](http://www.pse.com/energyEnvironment/energysupply/Pages/EnergySupply_ElectricitySolar.aspx)

### **Solar Power**

PSE: Leader in Solar-Powered Generation  
Puget Sound Energy Website

Puget Sound Energy is the Pacific Northwest's largest utility producer of renewable electricity. PSE owns and operates two large wind farms in Washington state – Wild Horse near Ellensburg, and Hopkins Ridge, near Dayton. In its pursuit of additional supplies of renewable power, PSE is constructing the Northwest's largest solar-power generating facility.

[http://www.pse.com/SiteCollectionDocuments/mediaKit/014\\_Solar\\_Power.pdf](http://www.pse.com/SiteCollectionDocuments/mediaKit/014_Solar_Power.pdf)

### **Puget Sound Energy expanding solar power**

Customer homes, Wild Horse Solar Facility contribute to growing solar production  
Puget Sound Energy Website

BELLEUVUE, Wash. – (October 31, 2007) – Puget Sound Energy is deepening its mark in renewable energy, with the utility and its customers now boasting more than 1,200 kilowatts (kW) of combined solar-power generating capacity or enough to serve the total power needs of 125 homes.

Already the Northwest's largest utility producer of renewable energy by virtue of its two large wind farms in Washington state, PSE this month finished building the main installation of the Northwest's largest solar-power generating facility at the company's Wild Horse Wind Facility near Ellensburg, Wash. Meanwhile, more and more PSE customers, with the utility's help, are developing their own, on-site renewable-power generating systems.

<http://www.pse.com/newsarchive/Pages/newsSolar103107.aspx>

#### 2) Seattle City Light

<http://www.seattle.gov/light/>

### **Install Solar**

Seattle City Light Website

Generating your own electricity using solar and other technologies is becoming more common in many parts of the U.S. and around the world. Recent federal and state incentives help make customer generation even more viable.

This page serves as an information gateway for customers interested in generating their own power. It includes steps for installing solar and links to other resources. There are also

frequently asked questions regarding solar energy, overview of solar electric technology, installation issues, and interconnection and permitting requirements.  
<http://www.seattle.gov/light/Conserve/cgen/>

### **Learn About Solar**

Seattle City Light Website

Does Solar work in Seattle? Absolutely! Seattle receives as much sun as Germany, the world's leading solar market!

There are two main types of solar energy systems: one produces electricity and one heats water.

Solar Electric Systems (also called Photovoltaic\* or "PV" systems) convert sunlight directly into electricity you can use in your home or business. With a photovoltaic system, you buy less electricity from Seattle City Light. If your system produces more electricity than you need at any given moment, the unused electricity goes back to the grid, spinning your utility meter backwards. This process is called "net metering."

Solar Hot Water Systems use the sun's heat to preheat the water that goes into your conventional water heater, so you use less energy to heat your water.

<http://www.seattle.gov/light/solar/default.asp>

### **Green Up Program**

Seattle City Light Website

What is Green Up?

Green Up is Seattle City Light's voluntary green power program for residential and business customers. By enrolling in Green Up, customers purchase green power for a portion of their electricity use and demonstrate their support for wind power and other new renewable energy projects in the Northwest. Choosing green power reduces our reliance on fossil fuels, improves air quality and helps reduce the growth of climate-warming emissions. The Green Up program is Green-e certified and fulfills LEED™ Project green power requirements. Through Green Up, you may also purchase green power for your organization's event.

<http://www.seattle.gov/light/Green/greenPower/greenup.asp>

3) Snohomish PUD

<http://www.snopud.com/>

### **Snohomish PUD Solar Express Program**

Snohomish PUD Website

Our Solar Express program provides cash incentives for customers who want to install solar photovoltaic or solar hot water systems in their home or businesses. This page describes the program for residential and business customers.

<http://www.snopud.com/?p=1207>

### **Solar Information**

Snohomish PUD Website

#### Net Metering

Washington's net metering law, enacted March 1998 (HB 2773) and revised in March 2006 (HB 2352), allows net metering for customers with solar, wind, hydro, biogas from animal waste, or combined heat and power technologies (including fuel cells) of 100 kW or less that are intended primarily to offset part or all of the customer's requirements for electricity.

Net excess generation is credited to the customer's next monthly bill. At the end of April, remaining unused kilowatt-hour credit accumulated during the previous year must be granted to the utility, without any compensation to the customer.

Taking advantage of Washington's Renewable Energy Production Incentives (effective 7/1/05 through 6/30/20) does not reduce or impact the savings achieved through net metering.

#### Federal – Residential Solar Tax Credit

The Energy Policy Act of 2005 (H.R.6) establishes a 30% tax credit for the purchase and installation of residential photovoltaic (solar electric) and solar water heating property. An individual can take both a 30% credit with no cap for a photovoltaics system and solar hot water system.

Solar water heating system must be certified for performance by the Solar Rating Certification Corporation or a comparable entity endorsed by the government of the state in which the property is installed. Note that the tax credit does not apply to solar water heating property for swimming pools or hot tubs. At least half the energy used to heat the dwelling's water must be from solar in order for the solar water heating property expenditures to be eligible.

Contact your tax professional or the IRS for applicability of the tax credit.

#### Washington State Production Incentive

In May 2005, Washington enacted Senate Bill 5101 and revised it in April 2009 (HB6170); establishing production incentives of 15 cents per kilowatt-hour (capped at \$5,000 per year) for individuals, businesses, or local governments that generate electricity from solar power, wind power or anaerobic digesters. The incentive amount paid to the producer is adjusted according to how the electricity is generated by multiplying the incentive by the following factors:

- For electricity produced using solar modules manufactured in Washington state: 2.4
- For electricity produced using a solar or wind generator equipped with an inverter manufactured in Washington state: 1.2
- For electricity produced using an anaerobic digester, by other solar equipment, or using a wind generator equipped with blades manufactured in Washington state: 1.0
- For all other electricity produced by wind: 0.8

The electric utility will pay the incentives and earn a tax credit equal to the cost of those payments. The incentives, once initiated by the Washington State Department of Revenue, will remain in effect through June 30, 2020.

<http://www.snopud.com/home/green/netmeter/solarinfo.ashx?p=1545>

#### 4) Avista

<http://www.avistautilities.com>

There is not much regarding solar energy on the Avista website except for some mentions on their utility blog.

<http://www.avistautilities.com/community/blog/archive/2009/09/24/092409.aspx>

#### 5) Clark County PUD

<http://www.clarkpublicutilities.com/>

### **Shedding light on solar power in Clark County**

Clark County PUD Website - September 22, 2009

Customers often ask about the feasibility of solar and other renewable energy in Clark County. Many of the answers to commonly asked questions can be found at an upcoming tour of solar energy projects in Clark County.

The Solar Washington Southwest Solar Tour will include seven different sites, said Bob West, an energy counselor with Clark Public Utilities. "In addition to seeing solar systems at work in typical homes, we have a small wind generator in La Center and a micro-hydro generator in Yacolt."

The seventh annual tour will take place from 10 a.m. to 4 p.m. Oct. 3. It will begin at Clark Public Utilities' community room, 1200 Fort Vancouver Way in Vancouver.

At the start of the event, West, along with John Zagunis of Act on Solar in Vancouver, will present details of the tour and answer questions about the use of solar and renewable energy. There is no admission fee, but attendees will be asked to purchase tour maps for \$5.

The tour features five residential solar electric systems, one commercial solar electric system, three different types of solar hot water systems, radiant floor heating, a micro-hydro generating project, a 1.9-kilowatt wind generating project and a geothermal application.

West will brief attendees on the technical aspects of tying a renewable generating system into the utility.

"It's really important that builders and electricians especially, but also homeowners, understand the interconnection process early on in the project, so they can be sure the residential system integrates with ours," he said.

<http://www.clarkpublicutilities.com/yourhome/freeResources/energyAdviser/archives/2009/092209/?searchterm=solar%20energy>

### **Solar-power systems effective but expensive**

Clark County PUD Website - April, 2007

As public concern for the environment increases, so does interest in renewable-energy systems. Many folks are interested in installing a solar or wind electric-generating system to help offset their utility bills as well as help the environment.

Obviously, the size of the system and how much it costs are part of the decision-making process; followed closely by how long will it take for the investment to see a positive return.

The advantage solar energy has over other forms of renewable energy is that it is available to most homeowners. While not every home has perfect southerly solar access, most homes have sufficient roof space to allow for collecting energy from the sun.

Cost is often the determining factor in the size of a solar electric system, says John Zagunis of Camas' Act on Solar.

[http://www.clarkpublicutilities.com/yourhome/freeResources/energyAdviser/archives/Archives2007/07\\_04\\_29/?searchterm=solar%20energy](http://www.clarkpublicutilities.com/yourhome/freeResources/energyAdviser/archives/Archives2007/07_04_29/?searchterm=solar%20energy)

### **The Bonneville Power Administration has an electric utility locator**

By entering a keyword to search for a northwest electric utility, city, or zip code, e.g. such as the name of the City, locate electric service information can be located. The utility service territories used in this locator are approximate; please check with the local utility for specific electric service information.

<http://www.bpa.gov/Energy/N/UtilityLocator.cfm>

### **BPA Public Tribal IOU Utility Service Areas – 2007**

A PDF of a map of all of the utility districts in the state is available through the WSDOT Library

The information does not indicate there is anything else in Washington State that compares with the proposed Teanaway project. The project's website: <http://teanawaysolar.com/>

### **News Articles on solar projects:**

#### **Stimulus Spotlight: Oregon's Solar Highway**

DC Streetsblog

Author: Elana Schor - August 20, 2009

The first of Oregon's "solar highway" installations received \$2 million from the federal stimulus. Washington's normally frenetic pace slows down in August, when humid weather and the absence of Congress combine to give the capital some recharging time. This month also marks a half-year since the economic stimulus became law, giving Streetsblog Capitol Hill an opening to examine some of the innovative -- and potentially controversial -- transportation projects funded by the Obama administration's \$787 billion recovery effort. Our first stop is Oregon, a hotbed for environmentally friendly transport policy where the ODOT uses about 47 million kilowatt-hours (kWH) of electricity each year to run lights, signals, and other illuminated features. To start offsetting its power needs with clean energy, the agency has built the nation's first "solar highway" system, installing linear arrays of photovoltaic panels along roadside land.

<http://dc.streetsblog.org/2009/08/20/stimulus-spotlight-oregons-solar-highway/>

#### **World's largest solar plant may be built in Cle Elum**

Seattle Times

Author: Sandi Doughton – July, 2009

The sunny, Central Washington town of Cle Elum could be the site of the world's largest solar photovoltaic power plant, if a Washington company makes good on plans announced today.

Teanaway Solar Reserve hopes to gain approval from Kittitas County to build a 75 megawatt plant, made up of 400,000 photovoltaic panels. The energy produced would be enough for 45,000 homes, said Howard Trott, the Kirkland man who heads the operation.

Trott said he expects the plant to be operational by 2011.

"If we can do this in the Pacific Northwest, we are hopeful this will launch other large-scale solar projects around the U.S.," said Trott, who for 22 years helped manage investments for Seattle telecom billionaire Craig McCaw.

Trott said McCaw is not putting up any money for the plant, which will cost "north of \$100 million." Trott would not reveal where the funds are coming from.

"As a privately held company, we are able to move quickly and have the resources to get this done," he said.

Teanaway Solar Reserve has leased 400 acres of private timberland about 4 miles from Cle Elum, near the scenic Teanaway Valley. The site has been heavily logged in the past, but is surrounded by Ponderosa pine forest that will screen the array from view, Trott said.

Because the area is already zoned for natural resources use, the only permits the company will need will be from Kittitas County, said Matt Steuerwalt, a company spokesman.

U.S. Sen. Maria Cantwell participated in the announcement, praising the plans. She pointed out the value of federal tax credits for solar projects, which she helped to extend.

"This project will move Washington into the second largest solar producer by megawatt, in the United States — behind California," Cantwell said.

The company also plans to lure a solar-panel manufacturer to Cle Elum, to produce the panels locally.

Trott said the project would create "hundreds" of jobs in the area.

[http://seattletimes.nwsourc.com/html/localnews/2009441447\\_websolar09m.html](http://seattletimes.nwsourc.com/html/localnews/2009441447_websolar09m.html)

### **Washington State a Solar Giant?**

earth2tech website

Author: Amy Westervelt – July, 2009

A solar project in Washington that aims to be "[the largest in the world](#)" upon completion was announced this morning. You read that correctly: Washington, home to rainy Seattle. The 75MW, 400-acre development will be located in Kittitas County, where the project's managing director, Howard Trott, says there is sun 300 days a year.

On a call this morning with reporters, Trott said that although the Teanaway Solar Reserve only just began its permitting process, the plan is to complete that process in six months and the timeline for construction is just one year. It's an ambitious timeline, to say the least. Trott, who has managed investments for telecom tycoon Craig McKaw for over 20 years, declined to name the group of investors involved in the solar project, but said that McKaw is not among them.

While Teanaway will benefit from Washington's sales tax exemption on the purchase of equipment used to generate power, Trott said the investors have decided to move forward with the project without waiting to see whether it will gain from the stimulus package. On the technology side, Trott said the project will use either crystalline PV panels or thin film — the decision of which one has not yet been made. But the area's snow season has limited the project to those two choices, because basically the climate isn't warm enough for solar thermal solar projects. Once Teanaway is online, it will feed into two nearby transmission lines (one owned by Puget Sound Energy, the other by Bonneville Power Administration) and provide power to over 40,000 homes, according to Trott.

<http://earth2tech.com/2009/07/09/washington-state-a-solar-giant/>

### **Review starts on Teanaway solar project**

The Daily Record Website

Author: Mike Johnston – August, 2009

KITTITAS COUNTY- With the submission to Kittitas County on Tuesday of the permit application for the \$300 million Teanaway Solar Reserve project begins a public review and permitting process that tentatively may end in December.

If there are no appeals or other actions that delay the orderly scrutiny of the proposed solar power plant, it's possible a final decision by the county Board of Adjustment may come in November or December, according to county Community Development Services officials.

County Planner Dan Valoff said the tentative December review completion date is just that, tentative, and could change due to a number of factors.

Valoff shared a general outline of the process to be used to publicly review the project that proponents say will be the world's largest solar power plant, with 400,000 photovoltaic panels, when completed on a 145-acre site four miles northeast of Cle Elum.

<http://www.kvnews.com/articles/2009/08/22/news/doc4a8f9c370cd44877052524.txt>

### **Greening the globe one energy grid at a time: solar reserve farms**

Examiner.com website

Author: Jean Williams – 2009

Solar energy captured by photovoltaic (PV) technology, is a clean, sustainable, environmentally friendly, and limitless source of energy--for as long as the sun exists. Energy from the sun light hitting the surface of the Earth during a forty minute period is equal to one year of global energy consumption.

Appropriately, solar farms are becoming a more viable option for capturing, storing, and dispensing this renewable energy source, as the cost of materials and manufacturing of solar panels continue do decrease.

The need for weaning the world off fossil fuel consumption has never been greater. The effects of global warming are becoming more apparent every year as the planet is threatened by increasing greenhouse gases.

Major glaciers are melting, many global water sources are in jeopardy, wildlife extinctions are being pushed to the brink, extreme hot and cold weather patterns are emerging, sea levels are rising, new and deadly diseases are on the rise, wildfires are increasing, and national security is facing a whole new set of challenges.

The previous US administration did not see global warming as an urgent Threat. So, the Obama administration has taken measures to get back into the race to urgently stem what could be catastrophic results for the planet. Renewable energy in every form is being explored and solar is a leading option.

One such solar farm being planned in Washington State is known as the Teanaway Solar Reserve. It will be located 80 miles east of Seattle near Cle Elum; an area that gets 300 days of sun per year. But, even on cloudy days, PV solar can provide 25% of normal output.

<http://www.examiner.com/x-5266-Seattle-Environmental-Policy-Examiner~y2009m9d13-Greening-the-globe-one-energy-grid-at-a-time-solar-reserve-farms>

### **Doubts surround proposed solar facility**

Daily Record Website

Author: Mary Swift – August, 2009

CLE ELUM -- Backers of the proposed Teanaway Solar Reserve, planned for a site four miles northeast of Cle Elum, say the project will provide clean energy, local jobs and revenue for Kittitas County.

The project is the largest solar facility ever proposed for the Northwest and potentially could become the largest solar facility in the world producing up to 75 megawatts of power, enough energy to power nearly 45,000 homes.

But for the public, questions -- and some confusion -- abound. Among them: What the actual cost of the privately funded endeavor will be?

When Howard Trott, managing director of Teanaway Solar Reserve LLC, announced the project early in July, he was quoted as saying the project would cost more than \$100 million. A little more than a month later, that projection rose to more than \$300 million. SeattlePI.com noted that formulas used by the Northwest Power and Conservation Council, created by Congress in 1980 to give Northwest residents a stronger voice in developing a power plan that guarantees adequate energy at the lowest economic and environmental cost, put the figure at a minimum of \$525 million.

<http://www.kvnews.com/articles/2009/08/29/news/doc4a98c8189cc91196487164.txt>

### **What: "2nd Annual Solar Power: Projects and Permitting" Seminar**

When: December 2, 2009

Where: Washington State Convention & Trade Center -- Seattle, WA

Solar power is becoming a viable, reliable, and cost-efficient form of energy in the Northwest. If you own property, or if you represent clients with real estate, or are simply interested in the

possibilities of Solar Power, you should join us at the Second Annual Solar Power - Projects and Permitting Conference. Join us to learn about the possibilities, and how to put them into action.

- Solar Power: Recent History and Future Potential
- Solar Policy: Incentives and Markets
- Financing Solar Projects
- Residential Solar Updates and Commercial Solar Projects
- LEED Certification and Other Green Building Certification Programs
- Becoming an Accredited Installer
- The View from a Utility

<http://energyexperts.org/TrainingEducationandEmployment/EventDetails.aspx?ID=11812>