

# **A Northwest Perspective on Solar Electric Industry Market Development**

Washington, Oregon, Montana, Idaho, the Bonneville Power Administration, and the Seattle Regional Office, U.S. Department of Energy have formed the Northwest Solar Alliance (NSA). The NSA seeks to spur the manufacture and use of solar electric systems, including photovoltaic (PV) systems in the Northwest. The mission of the Northwest Solar Alliance is to coordinate efforts to promote solar electricity in the Northwest.

## **Objectives and Reasons to Promote Solar Electric Resources in the Northwest**

We are promoting solar electric resources, including PV in the Northwest because this is where we live and it's the right thing to do. Our general objectives are:

- To reduce global warming and other environmental threats.
- To support the national Million Solar Roofs Initiative by installing 10,000 systems regionally by 2005 and 40,000 by 2010.
- To support Pacific Northwest solar electric manufacturers, installers and consultants.
- Make a smooth transition into the solar age.

## **Overview of Northwest Solar Strategy**

Participants in the NSA will work together to create a stable, supportive, early-adopter market for solar electric systems that steadily builds regional demand and makes the Northwest a leading solar market by:

- Reducing the cost of solar electricity for early adopters
- Developing qualified solar technicians and technology innovators
- Creating regional public awareness of PV's value and potential
- Identifying and implementing viable projects
- Facilitating activities that reduce the cost of solar electric equipment in the Northwest

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*When the Edison light bulb was first mass-produced, it cost more than \$50 in 1999 dollars. Enough people chose it over cheaper -oil lamps that within a decade electric power had become accepted practice.*

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## **PV Market Potential**

The photovoltaic industry is progressing rapidly worldwide while costs continue to decrease. For example:

- World PV production has grown more than 25 percent annually during the past five years.
- Advances in microelectronics and system integration have dramatically reduced the cost and complexity of the balance-of-system (BOS) components for grid-tied systems. Complex custom BOS equipment that cost \$20,000 five years ago is now UL-listed, meets all NEC requirements and costs only \$7,000. Complete “seven connections . . . press the button” BOS units will be available within two years for less than \$2,500.
- A 50 MW amorphous silicon PV manufacturing facility, under construction today in Maryland, will be producing PV modules at half the current market cost by 2003.
- Building-integrated photovoltaics are widely used in Western Europe to displace such building features as marble façade, curtain wall assemblies and other architectural elements. These applications provide increased property and marketing value – even before considering the energy savings.

## **Solar in the Northwest**

The Northwest is one of the few places in the world primed to become a major player in the photovoltaic industry. The solar industries of Oregon, Washington and Idaho show signs of significant development. For example:

- IdaCORP Technologies owns the nation’s second-largest photovoltaic systems integrator.
- Washington is home to the world’s largest DC-AC power inverter company.
- Vancouver, Wash. has 20 percent of the world’s PV crystal-growing capacity.
- Oregon has one of the oldest and most well established networks of solar energy contractors and professionals. With their help, Oregonians have installed more than 20,000 solar water heating, space heating and photovoltaic systems over the past 20 years.
- Each of the Northwest states has begun a remote PV incentive program and developed strategies to achieve the goals established by President Clinton’s Million Solar Roofs Initiative.
- Oregon and Washington have net metering laws that facilitate interconnection to the utility grid.

The Northwest has several key elements for a viable PV industry: excellent ports for Pacific Rim markets, low-cost hydropower, an established microelectronics industry and major suppliers of aluminum. The marriage of these elements with the public’s growing interest in environmental stewardship could be harnessed to the advantage of the PV industry.

More than 60 percent of the region receives at least as much annual direct normal solar radiation as Florida. Untapped demand of cost-effective, grid-independent PV applications in the region is estimated at 5 to 10 megawatts (2,000-4,000 homes plus other applications).

At current PV power costs, an electricity product comprising nine parts low impact hydropower and one part PV power could be sold for 15 percent less than national average electricity rates.

The window of opportunity for the Northwest to become a major manufacturer for the world PV market is closing. (European companies have over the last five years bought all major U.S. PV production facilities and companies.) Each year that we delay entry exponentially diminishes the Northwest's potential to reap the benefits of the global market.

### **Where Do We Start?**

To develop the Northwest market we need to demonstrate commitment to the technology and shepherd the development of a robust mixture of manufacturing companies, system integrators, supportive design professionals, and trained installation technicians. And we need to build a regional demand for PV power.

#### ***Importance of Local Markets***

- Local markets foster technological innovation and expertise
- Local markets provide good testing grounds to improve product line photovoltaics
- Local demand creates interrelated businesses that broaden support
- Local markets diversify the economic base of the region
- Local markets provide a solid income base that enables expansion into volatile international markets

The rapidly evolving PV market is highly competitive. Local demand is a key element for developing and maintaining a stable industry. Examples of where local demand has drawn industry include:

- Advanced Wind Turbine Co. relocated from Washington to California to more easily participate in the California market
- The Sacramento Municipal Utility District attracted local production for its PV program
- Advanced Solar Technology moved to California to be closer to the blossoming PV market in California resulting from utility restructuring incentives

### ***Objectives***

- Reduce the cost of PV systems to \$3.00 per watt by 2005 through technological improvements that increase efficiency and reduce costs
- Build a market now for \$3.00 per watt solar electric systems by:
  - Public subsidy
  - Bulk purchase
  - Low cost financing
- Develop qualified solar technicians and technology innovators
- Create regional public awareness of solar electric's value and potential
- Identify and implement viable projects

### ***Immediate Actions***

- Pursue funding of a regional solar program
- Request that NREL and Sandia National Laboratories run a PV "train-the-trainers" program
- Establish an open dialog among the regional players through a NSA
- Implement the remote PV incentive program begun in each state

### ***Near-term Actions (6 months-1 year)***

- Develop a PV marketing plan for the region. This would include developing an overall strategy to achieve the NSA mission, with goal setting and tracking of results.
- Promote off-grid photovoltaics using a standardized set of options (e.g., a regional "Plug-n-Play" program)
- Coordinate, organize and deliver training for PV and solar domestic hot-water technicians
- Obtain buy-down funding and easy financing for early adopters
- Publish a Northwest Solar Desk Manual for utility solar programs
- Adapt Idaho's PV consumer information package for Oregon and Washington
- Document PV solar electric systems that are being installed

### ***Mid-term Actions (1-2 years)***

- Get public and private commitments to bulk hardware purchases
- Make available and incorporate, where applicable, PV educational programs in Northwest high school science classes
- Plan Solar Star communities and developments
- Train utility electricians and code inspectors in PV technologies

### ***Long-term Actions (2-6 years)***

- Attract significant PV equipment manufacturing facilities for regional, national and international markets
- Help establish market outlets for PV products

## Regional Players Appendix

The following is a *starting point for discussion* about what each of regional player can do to help establish the Northwest as a world leader in photovoltaic and related renewable energy technologies.

### Everyone

- Commit to installing PV systems locally – build local infrastructure and technical know-how
- Support net-metering and uniform interconnection standards for grid-tied PV systems
- Market and promote the long-term environmental and economic benefits of PV commerce in the Northwest

### State Program Offices

- Assist in the identification and implementation of photovoltaic applications
- Arrange low-cost financing and financial assistance for PV applications
- Increase public awareness of PV technology
- Work with industry and utilities to establish criteria for quality installations
- Regionalize Washington State University’s “Plug-n-Play” program of incentives and standard design criteria for remote PV systems
- Develop a Northwest Solar Desk Manual – a how-to guide for utility staff

### Bonneville Power Administration

- Participate in Million Solar Roofs activities through involvement in Northwest state coalitions and the Federal Energy Management Program
- Encourage the development of an Inventory of in-house PV applications
- Integrate photovoltaics into the Conservation and Renewables Discount program
- Facilitate solar-electric education and training with customer utilities
- Work with customer utilities interested in developing solar-electric projects
- Expand solar-electric industry participation in the Northwest Energy Efficiency Business Listing
- Financially support or purchase the output from at least two solar electric projects
- Continue direct funding of proportional share of the Regional Solar Radiation Monitoring Project
- Promote solar electricity through conferences and forums

### Retail Electric Utilities

- Off-grid support
  - Distribute informational materials and the Northwest Solar Desk Manual
  - Offer lease/purchase of PV systems in lieu of line extensions
- On-grid support
  - Offer green power that includes locally produced PV power

Adopt a standardized net-metering policy  
Assist residential customers with net metering for PV power

- Encourage staff education in PV applications

#### **Local SEA and SEIA Chapters and Idaho PV4You**

- Conduct coordinated regional marketing efforts
- Conduct training workshops and establish partnerships with electricians
- Install PV systems that meet standard design criteria developed by state energy offices in cooperation with solar energy organizations

#### **National Center for Appropriate Technology**

- Provide technical assistance for educational programs to support regional efforts

#### **EPA**

- Promote the use of PV power as a core technology to reduce CO<sub>2</sub>-related climate change
- Actively encourage regional offices to install PV systems

#### **National Parks Service**

- Continue to install PV systems in suitable remote applications
- Provide showcase examples of PV systems

#### **Utility Commissions**

- Allow utilities to recover some or all expenditures in photovoltaic applications
- Support a uniform net-metering policy

#### **USDOE**

- Support regional Million Solar Roofs coalitions
- Work with other federal agencies to install PV systems

#### **DOE – National Laboratories**

- Establish a “train-the-trainer” program for PV and solar domestic hot water systems

#### **Renewables Northwest Project**

- Provide political and public advocacy support

#### **Bonneville Environmental Foundation and Other Foundations**

- Support local solar groups in their public education activities
- Leverage private investments in PV systems
- Support development of utility PV power programs
- Support key activities necessary for the development of the solar industry not being funded by other agencies.
- Leverage investments in PV systems by schools, low income, churches, and non-profit agencies

**Building Codes Departments**

- Train staff on proper inspection of grid-tied and grid-independent PV systems

**Economic Development Offices**

- Develop incentives to draw PV manufacturing facilities to the Northwest

**Interstate Renewable Energy Council**

- Assist states in establishing solar schools projects
- Provide education and promotional materials

**Northwest Energy Efficiency Alliance**

- Assist in the development of training programs for solar contractors
- Provide matching funds for utility training and development of interconnection standards

**State Park Service, State Department of Transportation, U.S. Forest Service, Tribes**

- Inventory all cost-effective remote applications
- Purchase a specific amount of PV power each year for the next 10 years

**University of Oregon Solar Energy Center and Solar Monitoring Laboratory**

- Continue providing accurate and detailed solar resource data and analysis
- Continue serving as a clearinghouse for public information about solar energy

**Home Power Magazine**

- Provide technical and hands on information about remote and grid-tied PV systems
- Provide coverage of regional events, training, and market development.

**Portland Energy Conservation Inc.**

- Actively pursue the use of commercial building integrated PV applications

**Note to All others**

The above list is neither complete nor intended to be exclusive. The enthusiasm and resources of all interested parties are by definition a part of the regional effort to make the Northwest a major global player in photovoltaics.

*Signatory Page*

*Oregon, Washington, Idaho, Montana, the Bonneville Power Administration, and the Seattle Regional Office, U.S. Department of Energy, acting as Charter Members:*

*I, the undersigned, acting for my designated organization, support the goals of the Northwest Solar Alliance as embodied in this paper.*

*[Signature]* 2/7/00  
Signatory Date  
*Oregon office of Energy*  
Organization

*[Signature]* 1/12/00  
Signatory Date  
*Washington State University Energy Program*  
Organization

*[Signature]* January 26, 2000  
Signatory Date  
*Idaho Department of Water Resources Energy Division*  
Organization

*[Signature]* 1/31/00  
Signatory Date  
*National Center for Appropriate Technology*  
Organization

*[Signature]*  
Terence G. Esvelt January 28, 2000  
Signatory Date  
*Bonneville Power Administration*  
Organization

*[Signature]* 2/16/00  
Signatory Date  
*Seattle Regional Office, U.S. DOE*  
Organization

- Oregon Office of Energy*
- Washington State University Energy Program*
- Idaho Department of Water Resources, Energy Division*
- National Center for Appropriate Technology (Montana)*
- Bonneville Power Administration*
- Seattle Regional Office, U.S. Department of Energy*

*Signatory Page*

*The following organization supports the goals of the Northwest Solar Alliance and by virtue of its signature becomes a partner in the NSA.*

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*Signatory*

*Date*

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*Organization*