



# Greater Seattle and Washington State: Your Partner in Clean Energy

TRADE  
DEVELOPMENT  
ALLIANCE  
*of*  
GREATER  
SEATTLE



*An overview of Washington State's clean energy industry for prospective partners in business, investment, and research*

**Center of Clean Energy**

**Projects**

**Research**

**Home to Industry Leaders**

**Areas of Opportunity**

**Supporting the Industry's Success**



## Center of Clean Energy

**As a region, the Pacific Northwest has a wide array of clean energy sources. In particular, Washington State has jumped to the forefront of clean energy and is already using several renewable sources such as wind power, solar power, and biofuel. Other renewable sources such as fuel cells, wave power, and ethanol/methanol, among others, are also being developed.**

Washington State boasts an abundance of clean and renewable energy sources. As demand for energy grows, clean energy sources become more important not only in terms of meeting the demand, but also in terms of environmental concerns and issues regarding energy independence. Washington State's long history of a strong environmental ethic coupled with a high-tech economy creates an atmosphere of innovation in this region's clean energy industry.

In 2004, Washington State had 241 organizations involved in the clean energy sector (composed of renewable energy, smart energy, and energy efficiency organizations). Eighty-five percent of these organizations work with some type of renewable energy. Altogether, they employed 8,373 people at an average wage of \$60,000, for a total of over \$500 million in wages. Total revenues from these organizations were \$2.1 billion, more than Washington State's logging industry (\$1.9 billion) and coffee/espresso shop industry (\$1.7 billion) revenues. The Puget Sound region alone has a \$330 million clean energy industry, with 64 percent greater concentration of clean energy jobs than the U.S. average.

## Clean Energy Projects

Clean energy projects, from wind farms in Central Washington to biofuel agricultural experiments in Snohomish County, are increasing in number and scope.

### [Wild Horse Wind Power Project](#)

Puget Sound Energy's Wild Horse Wind Facility is located in central Washington State's Kittitas County (stretching from the Cascade Mountains to the upper Yakima River Valley plains and the Columbia River), an ideal location for a wind farm due to the strong winds that blow across the area's grasslands. Puget Sound Energy (a regulated utility providing electric and natural gas service primarily to the Puget Sound region) began producing energy at the facility in December 2006. Wild Horse, with 127 wind turbines capable of generating up to 229 megawatts of power, produces enough electricity to serve the total needs of approximately 55,000 homes.

### [Hopkins Ridge Wind Project](#)

Puget Sound Energy began producing energy at its Hopkins Ridge Wind Facility in November 2005. Located in southeast Washington's Columbia County, the wind farm features 83 wind turbines that together can generate up to 150 megawatts of capacity, producing enough electricity to serve the power needs of approximately 40,000 homes. The combined output of the Wild Horse and Hopkins Ridge wind farms makes Puget Sound Energy the largest utility producer of renewable energy in the Pacific Northwest.

### [King County Metro Transit](#)

King County Metro Transit is a clean energy pioneer when it comes to public transportation. In 2004, King County Metro and Sound Transit purchased 235 hybrid diesel-electric buses. These were the first hybrid double-length buses in North America. Not only do the hybrid buses produce 90% less emissions than their predecessors, but they also consume 20-30% less fuel. Additionally, Metro Transit is taking part in a biodiesel pilot project that will create the largest biodiesel-powered fleet in the state. Metro has committed to pilot the use of a blend of five percent biodiesel and 95 percent Ultra Low Sulfur Diesel (ULSD) and is already using the fuel at its Ryerson and Bellevue bases. By the end of 2006, approximately half of Metro Transits 1,200 strong fleet was powered by biodiesel.



## **Clean Energy Research**

Our State's universities and other organizations are also major contributors to the growing pool of research in this sector.

### **[Forest Systems & Bio-Energy Program at the University of Washington](#)**

The Forest Systems & Bio-Energy Program (FSB) is researching the integration of sustainable forest management systems with emerging technology in the renewable energy sector, particularly hydrogen fuel cells, through small-scale, mobile, wood biomass chemical conversion to liquid fuel.

### **[Northwest Solar Center \(NWSC\)](#)**

The mission of the NWSC is to encourage the market transformation of solar technologies from off-grid niche to grid-connected markets, to assist in the integration of renewable energy systems with efficiency and conservation technologies, to help increase technical knowledge among utilities and the public, to catalyze the creation of jobs in the renewables industry, to evaluate and improve renewable technologies, and to help accelerate the installation of solar electricity throughout the Pacific Northwest.

### **[Pacific Northwest National Labs \(PNNL\)](#)**

Located in Richland (Eastern Washington) with a satellite office in Seattle, PNNL is one of the U.S. Department of Energy's (DOE's) nine multiprogram national laboratories, managed by DOE's Office of Science. PNNL conducts a wide range of activities, including research on increasing U.S. energy capacity and reducing dependence on imported oil through research of hydrogen and biomass-based fuels in addition to reducing the effects of energy generation and use on the environment.

### **[Washington State University \(WSU\) Energy Program: Renewable Energy](#)**

The WSU Energy Program is a self-supported department within the university's Extension service. It provides technical assistance in support of the development of renewable energy in Washington State and nationwide. Specialists in renewable energy work with businesses and individuals on choosing energy sources wisely – including assistance with the planning, financing and permitting of renewable energy projects.



## Industry Leaders

Washington State is home to several leaders in the clean energy sector as well as start-ups breaking into still emerging areas of this industry. With our high-tech economy, well-educated populace, environmental consciousness, and several clean technology resources, Washington is an ideal location for clean energy companies and organizations.

### [Puget Sound Energy \(PSE\)](#)

In late 2005, Bellevue-based PSE became the first (and so far only) utility in the Pacific Northwest to solely build and operate a large wind farm. The Hopkins Ridge Wind Project, located in southeast Washington's Columbia County, is already producing clean, renewable, low-cost energy for PSE subscribers. PSE was also the first to purchase a wind farm, the Wild Horse Wind Power Project near Ellensburg. Five-percent of PSE's power will come from wind farms. PSE hopes to double this number to ten-percent within the next decade. PSE is also involved in a variety of studies, pilot projects, and small-scale renewable-power initiatives devoted to the development of additional renewable energy resources.

### [Imperium Renewables/Seattle Biodiesel, LLC](#)

Imperium Renewables is one of the nation's leading biodiesel refiners and the first company in the Pacific Northwest to open and operate a commercial-scale biodiesel refinery producing fuel that meets or exceeds industry standards. The Seattle refinery, run under the name Seattle Biodiesel, LLC, makes a clean-burning alternative fuel derived from vegetable oil. Their biodiesel can be used by itself in any conventional diesel car or truck, or it can be blended with regular diesel.

### [Sound Refining](#)

Sound Refining, a petroleum logistics and marketing company, opened a new biodiesel operation in Tacoma in April 2007. It is one of the first fully automated, biodiesel blending/loading facilities in the Pacific Northwest. Sound Refining's new automated biodiesel blending rack will allow for increased consistency in the biodiesel blending process. Sound Refining is also ethanol capable and is looking at expanding into this market to achieve the goal of increasing renewable fuel use and reducing emission and pollutants in Washington State.

### [Neah Power Systems](#)

Located in Snohomish County, Neah Power Systems is a micro fuel cell development company using a patented, silicon-based design to provide long-lasting, efficient, and safe power solutions for portable electronic devices, such as laptop computers. Neah Power Systems products are expected to allow users to extend the operating time of their devices multiple times beyond that of conventional batteries. For example, mobile tracking devices used in the logistics industry often run out of battery power before a shift is over, requiring elaborate "recharging stations." However, Neah Power Systems' fuel cells can produce power as long as a fuel source is provided. When one fuel cartridge is exhausted, another one can easily be inserted to continue the power supply.

## Solar Electric Systems

This Bellingham-based company offers consulting, design and installation of large and small off-grid or grid-connected solar electric arrays and wind powered generators for residential and commercial clients. They can also provide assistance on how to take advantage of state, federal, and local utility incentives offered to clean technology users.

## **Areas of Opportunity**

Washington State enjoys availability of several clean technology resources. Some of these include biomass, geothermal, hydropower, solar, and wind. In addition to these renewable energy sources, Washington State universities and companies are on the cutting-edge of research in high-tech clean technology options such as fuel cells. Washington State also offers some financial and tax incentives for companies using, selling, or buying clean energy resources.

### **Biomass**

Studies have shown that Washington State has excellent biomass resource potential with resources such as small diameter forest materials and wastes, landfill biomass, dedicated energy crops, and agricultural residue. Sufficient biomass exists that can be sustainably collected on an annual basis. Washington is also home to leading companies in producing by-products from biomass resources such as biodiesel.

### **Solar**

Washington's solar resources vary across the state, with Eastern Washington possessing the most potential for solar power projects. An incentive for development in this area is a recent state law creating a reduced business and occupation tax rate for Washington manufacturers and wholesale marketers of solar-electric (photovoltaic) modules or silicon components of those systems. Moses Lake's Renewable Energy Corporation (REC) began construction of a new production facility for granular polysilicon in August 2006. The new plant will be built adjacent to REC's existing plant, which produces solar grade silicon. Approximately one quarter of all solar cells in the world are made from REC's polysilicon.

### **Wind**

Central Washington has the largest contiguous areas in Washington State with good to excellent resource for wind power. Puget Sound Energy's Wild Horse Wind Power Project is in central Washington, and Kittitas Valley is being considered for other wind power projects as well. According to APCO Worldwide, Washington State has the wind energy potential for an average power output of 3,740 megawatts.

### **Energy Efficiency**

Energy efficiency means doing the same work, or more, and enjoying the same comfort level with less energy. Energy efficiency is technology-based, so opportunities exist



in this market for the creation of more efficient products such as appliances, and vehicles. The most common type of clean energy industry in Washington State is energy efficiency with 133 organizations and companies in 2005. Furthermore, in 2005, Governor Christine Gregoire signed the high performance green buildings bill into law which makes Washington the first state to require that new public buildings meet “green building” standards of energy efficiency, water conservation, and other environmental standards.

### **Fuel Cells/Nanotechnology**

With strong research universities, an established high-tech economy, and innovative start-ups in the clean technology sector, Washington State is an ideal place for the study and development of fuel cell technology and energy application of nanotechnology. In addition, there exist possibilities for Greater Seattle area collaboration with Vancouver, British Columbia (Canada), which is also at the forefront of nanotechnology research.

### **Supporting the Industry’s Success**

A wide array of non-profit, public, and private organizations exist to support and promote Washington’s clean technology sector.

#### **[Puget Sound Clean Cities Coalition \(PSCCC\)](#)**

This voluntary, public/private partnership works to advance the region’s environmental and public health, energy security, and economic development by promoting policies and practices that reduce petroleum consumption in transportation. PSCCC is part of a network of more than 80 communities within the US Department of Energy’s (DOE’s) Clean Cities Program.

#### **[Washington Clean Technology Alliance](#)**

The Washington Clean Technology Alliance aims to secure the region’s position as a leader in clean technologies. It supports Washington businesses to take full advantage of the clean tech industry opportunities emerging within the state and around the world. This business alliance was created through a collaborative effort of the Prosperity Partnership, a coalition of government, business, labor, and community organizations from the Puget Sound region dedicated to developing and implementing a common economic strategy.

#### **[Northwest Biodiesel Network](#)**

The mission of the Northwest Biodiesel Network is to promote the use of biodiesel in the Northwest as an immediate and effective way to advance environmental health, economic strength, and social and political well-being in our communities, our nation, and the world.

### **PARKERMESSANA™ Consulting Engineers**

PARKERMESSANA™ Consulting Engineers, a leading global engineering consulting services company, pioneers, creates and licenses IP (Intellectual Property) to enable producers in the biofuels market achieve higher profitability through lower production costs, faster delivery, and higher volume. PARKERMESSANA™ Consulting Engineers creates and develops innovative and fresh new technologies for the biodiesel, cellulosic biomass, and ethanol markets. The company is the designer of America's largest biodiesel plant, Imperium, located in Grays Harbor, WA.

### **Climate Solutions**

Climate Solutions is a non-profit organization that seeks to stop global warming through practical solutions, such as their "Harvesting Clean Energy" program, which engages a broad array of agricultural, rural development, and clean energy partners in the Northwest to accelerate renewable energy development in rural communities.

### **NW Energy Coalition**

The NW Energy Coalition is an alliance of more than 100 environmental, civic, and human service organizations, progressive utilities, and businesses throughout the Pacific Northwest. The Coalition promotes development of renewable energy, energy conservation, and low-income energy assistance, among other things.

### **Renewable Northwest Project**

The Renewable Northwest Project is a regional nonprofit advocacy organization promoting responsible development of wind, solar, and geothermal resources in the Pacific Northwest.

### **Seattle's Green Ribbon Commission on Climate Protection**

Seattle Mayor, Greg Nickels, issued the "Kyoto Challenge," a national effort to tackle climate disruption and implement the Kyoto Protocol in cities across the United States as part of the U.S. Mayors Climate Protection Agreement. The Mayor appointed the Green Ribbon Commission on Climate Protection (composed of 18 leaders from Seattle's business, labor, non-profit, government and academic communities) to meet the Kyoto goal. This Commission's goal is to reduce Seattle's main climate pollutants, emphasizing solutions that reduce driving, increase fuel efficiency and use of biofuels, and reduce energy use in homes and businesses.

### **King County Executive Initiative on Global Warming**

King County Executive, Ron Sims, has led the way in positioning King County to meet and exceed the Kyoto Protocol on Climate Change. Some of the strategies in place to achieve this initiative include public transportation (getting more people onto leaner and greener buses), innovative environmental management (turning waste into energy), and developing a clean energy future (stimulating climate-friendly fuel and technology markets for a prosperous, sustainable economy). As a result of these strategies, King County has received national recognition for its "forward-looking" policies.