

Washington

Overview and Summary

In many ways Washington deserves its reputation as a leader in the green economy and in clean-technology research. It is already an industry leader in wind-energy generation, green buildings, and biofuels research, and it is currently pursuing the integration of alternative fuel vehicles into its transportation infrastructure. The prospect of another year of budget shortfalls in the legislature will likely continue to limit the state government's direct investment into green economic development programs, but advances will likely continue due to the state's efforts at coordination combined with abundant private sector investment and a strong network of interconnected industry and civil society organizations interested in clean energy. Beyond the programs and policies described below, Washington is distinct for a political culture that is sensitive to green issues and is apparent in state officials who lead with new policies, educators who wish to incorporate environmentally sound principles into curricula, and industry leaders who find what will end up being fixtures of the state's green economy in a situation that remains very fluid today (Hardcastle 2010, Ranken 2010). Among the government initiatives that build on the foundation are the following highlights:

- Washington has green jobs growth legislation that favors members of the military and disadvantaged citizens and has ordered ongoing study of green job creation in the state through the Evergreen Jobs Initiative
- A state government plan includes audits for nonresidential private buildings.
- The state was able to pursue successfully a place in the U.S. Department of Energy's Electric Vehicle Project and integrated this into its plans to participate in the regional West Coast Green Highway Project.
- Seattle has developed an accelerated permitting process for clean-energy and other businesses.
- Seattle has an aggressive weatherization plan that is supplemented by federal funding.

General Background Policy

Energy Goals. In 2006 Washington voters approved Initiative 937, a progressively increasing renewable portfolio standard that will reach a 15 percent requirement by 2020. Acceptable forms of generation include wind, solar, geothermal, tidal, and the combustion of some forms of landfill gas, sewage gas, and biomass. This initiative also requires all utility companies in the state to undertake all cost-effective energy conservation measures, with mandatory reassessments every two years and a non-compliance penalty of \$50 per megawatt-hour to be paid into a public facility energy conservation fund (State of Washington 2006). Executive Order 02-03 directed all state agencies to submit sustainability plans every two years and established the Interagency Sustainability Committee to coordinate the sharing of information and practices from these plans (State of Washington 2002). Taking the benchmarks set out in Executive Order 07-02, the 2008 Climate Action and Green Jobs Act (E2SHB 2815)

established the following requirements on greenhouse gas emissions in the state: by 2020 they must be no higher than 1990 levels, by 2035 they must be 25 percent below 1990 levels, and by 2050 they must be 50 percent below 1990 levels. The aforementioned executive order also mandates a 20 percent reduction in spending on state energy imports by 2020 (State of Washington 2007, Washington State Legislature 2008b).

In 2009 the Department of Community, Trade, and Economic Development (subsequently renamed the Department of Commerce) released its Green Economy Strategic Framework, offering a set of fundamental recommendations to the state government. Salient points include allowing the market, not policy, to select what technologies are implemented, keeping a “broad definition of green economy” to avoid excluding certain jobs, companies, and industries, and answering industry concerns about the state’s convoluted permitting process by expanding the Governor’s Office of Regulatory Assistance (State of Washington 2009b). Washington’s Clean Energy Leadership Council, established by SB 5921, is currently compiling its own strategic briefing on clean-energy technology for the governor that should be delivered by the end of this year. A strategy presentation was given to the Council in June, 2010, broadly recommending support for smart-grid implementation as a means to encourage both better renewable energy integration (particularly for wind power) and more efficient building projects. The other major policy recommendation was increased support for the state’s emerging bioenergy sector, specifically promoting the development of biofuels for aviation as an entry point into cultivating a larger market and more mature technology (Washington Clean Energy Leadership Council 2010). Both of these reports use a mix of supply- and demand-side language, albeit broadly, which is a subtle shift from the primarily demand-side policies that Washington has implemented, as detailed above.

Public Benefits Fund. The state does not have a public benefits fund.

Green-Buildings Policy. In 2001 the state passed three laws (HB 1859, EHB 2247, and SB 6107) that required state government buildings to undertake energy audits, enabled electricity consumers to opt for green electricity sources, provided tax credits for renewable energy generation, and provided tax incentives for distributed energy generation and pollution control equipment (State of Washington 2001). In 2005 Executive Order 05-01 and SB 5509 set guidelines for state government buildings. The executive order required that all new buildings of state agencies and major renovations meet green building standards. Projects of over 25,000 square feet for state buildings were required to meet the LEED “silver” certification level or a designated equivalent. The legislation also set LEED “silver” certification goals for all projects of over 5,000 feet for state agencies, K-12 schools, and other organizations receiving higher education funding. In 2009 the state passed the “Efficiency First” legislation (SB 5854), which required state agencies to reveal the results of energy audits of their buildings, the state government to develop a general plan for energy efficiency, state agencies to sign new leases in private buildings with an Energy Star rating above seventy percent, nonresidential building owners to conduct audits and reveal the results to prospective buyers and lessees, and buildings to be seventy percent more efficient by 2031 (Gregg 2009). In that year the state also began to spend \$14.5 million of federal stimulus funding to support a goal of weatherization projects for 100,000 buildings over a five-year period (Green for All 2009, Washington State Legislature 2010e). Additionally, in April, 2010, EHB 2561 was passed by the legislature, proposing a \$500

million energy-efficiency retrofit of school facilities at all levels of education. The proposal awaits final approval by voter referendum in November (Washington State Legislature 2010d). The Northwest Power and Conservation Council's Sixth Power Plan projects that 85 percent of energy demand growth over the next 20 years can be accounted for by efficiency improvements, and lays out a plan of action for utilities and trade organizations related to energy efficiency to meet its projections (Northwest Power and Conservation Council 2010).

Green Jobs Training. The Climate Action and Green Jobs Act of 2008 issued two key directives with regard to green job development in Washington: it instructed the Employment Security Department (ESD) to conduct a study of the status and disposition of green jobs in the state, and set the goal of raising whatever number was found by that study to 25,000 jobs by 2020 (Washington State Legislature 2008b). Rather than relying on previous research that only considered clean energy employment, the 2008 study by the ESD began with a new definition of a green job: those that fall into the areas of increasing energy efficiency, preventing or cleaning up pollution, or generating renewable energy. By surveying over 9,500 employers in the state this study was able to estimate that 47,000 green jobs existed in the state, mostly falling into the first category of energy efficiency, making the original growth goal defunct (State of Washington 2009a).

The next year the Evergreen Jobs Initiative (E2SHB 2227) was passed, directing the ESD to perform additional studies, while creating the Evergreen Jobs Leadership Team to oversee the creation of new 15,000 green jobs by 2020, with the ultimate goal of making Washington a net exporter of green products. The Leadership Team will work towards the goal by coordinating efforts to secure both private and federal funding to invest in projects to create green jobs (or make existing jobs green) and train workers to fill those positions. In addition, the Green Industries Job Training Account was established under the direction of the Treasury Department to issue competitive grants for training programs. The legislation further specified that 30 percent of the new jobs should be set aside for veterans, national guard members, and the economically disadvantaged (Washington State Legislature 2010b).

The second study performed by the ESD expanded the number of industries and firms surveyed and sampled public service green jobs. The 2009 estimate was roughly 76,000 private-sector green jobs in the state, compared with 23,000 in the public sector, with the majority still residing in the energy-efficiency category (State of Washington 2010a). The studies intentionally used a short survey questionnaire to achieve higher response rates, but this does limit their ability to provide greater detail and explanatory power, and it also necessitated the use of pre-existing data to draw economic impact conclusions. Even so, the research team suggested that the numbers did not represent an emergent sub-sector that could be called a green economy, but rather they represent a shift in the practices of some occupations toward greening, as well as a greater recognition of some existing positions as being green. These studies have attracted national attention, and the Commonwealth of Pennsylvania is expected to conclude an agreement with Washington's ESD to conduct a similar study on its own green jobs situation (Hardcastle 2010). The provisions of the Evergreen Jobs Initiative also require that the ESD continue using similar surveys every two years as well as performing other, more narrowly focused investigations, such as current studies of the energy efficiency and forest products sectors. Other 2009 reports from Washington State University's Extension Energy Program show ongoing

concern by renewable-energy and energy-efficiency businesses about the availability of well-trained workers to match the anticipated growth in both areas (Washington State University 2009a, 2009b).

Clean-Energy Industries

General Background. The state does not have a program specifically to provide financial support for the clean-tech industry and clean-tech research. Washington Technology Center, one of the state's economic development agencies, supports the high-tech industry generally, and the state has some venture capital support for the clean-tech industry, including Cascadia Capital, Northwest Energy Angels, OVP Venture Partners. In 2007 the state's Department of Community, Trade, and Economic Development designated a series of Innovation Partnership Zones (IPZs), including three that have strengths in clean energy or energy efficiency. The Grays Harbor IPZ specializes in bioenergy, the Pullman IPZ is home to research into efficient IT infrastructure, and the Tri-Cities IPZ houses solar and fuel-cell innovators and contains both the Pacific Northwest National Laboratory and Washington State University's Bioproducts, Sciences, and Engineering Laboratory. The Department of Community, Trade, and Economic Development recommends that the state give additional support to IPZ locations like these that focus on clean-energy and other green technologies, but otherwise most of the state's incipient clean tech clusters rely on the efforts of individual laboratories and the federal funding (State of Washington 2009b, 2010c). More broadly, the state offers a sales tax exemption for all renewable energy generation equipment rated for over one kilowatt in capacity, and it offers up to \$5,000 per year in renewable generation incentives to residential, small business, local government, or community scale systems (DSIRE 2010).

Biofuels. The Energy Freedom Program was established in 2006, setting up a revolving loan fund under direction of the Department of Community, Trade, and Economic Development. This fund was allocated \$23 million and can issue up to \$5 million loans to biofuel projects in the state (State of Washington 2008b, Washington State Legislature 2006). In 2007 E2SHB 1303 was passed, requiring all diesel-powered state vehicles to use a B20 biodiesel blend by 2009. The law further ordered all state government vehicles that used biofuels to be supplied by feedstocks that are recycled or grown in-state (Washington State Legislature 2008a). The law was followed by HB 1481 in 2009, which mandated that all state and local government vehicles use electricity or biofuels (Washington State Legislature 2010a). There has been some delay in compliance with those standards, but the delay has not prevented the proposal of ESHB 2504, which would mandate a B2 blend for all diesel fuel sold in the state (Washington State Legislature 2010c). A variety of other legislative actions have granted tax incentives to bioenergy projects, including the use of anaerobic digesters (State of Washington 2010d).

Washington State University has laboratories working on biofuels and partnerships with industry via the Washington State Algae Alliance, a group that includes biotech companies Inventure and Targeted Growth Inc., and is being funded by \$2 million out of the Senate Energy and Water Development appropriations bill (New Energy World Network 2009). The university's Bioenergy Program is also supported by the Pacific Region Bioenergy Partnership, a group that includes five northwestern states and has U.S. Department of Energy funding to do

technology promotion and transfer (Pacific Region Bioenergy Partnership 2008). The Department of Energy has further granted \$1.1 million to be divided between the Bioproducts, Sciences, and Engineering Laboratory and the College of Agriculture, Human, and Natural Resource Sciences of Washington State University (Washington State University 2010). These programs collaborate with the Pacific Northwest National Laboratory, which has its own bioenergy program amongst other clean-energy research.

A 2008 Washington State University study identified 135 million gallons per year of biodiesel production capacity in Washington, 100 million of which were accounted for by the Imperium Renewables plant at Grays Harbor (Washington State University 2008a). Actual output levels, however, are not nearly that high. AltAir Fuels is currently converting an oil refinery at Anacortes and has reached an agreement with fourteen airlines to deliver 750 million gallons of bio-based aviation fuel (Business Wire 2009). Metro King County Transit of the Seattle area has also pioneered the use of biodiesel in its bus and ferry system, and there is widespread grassroots interest in biodiesel. The biofuels industry further includes many more high-tech start-ups, some of which are university spin-offs (Timmerman 2009).

Smart-Grid and Building Technologies. Another clean-energy industrial cluster in the state is smart-grid technology. In 2009 the Department of Energy awarded the Pacific Northwest smart-grid demonstration project a grant of about \$178 million (including matching funds) for a five-state project (Batelle 2009). The project includes several utilities as well as the Bonneville Power Administration and the Pacific Northwest National Laboratory. Although only one of the six primary corporate partners for the Pacific Northwest Smart Grid Demonstration Project had headquarters in the state, there is an emerging cluster of smart-grid companies in the state, including Alerton, Alstom, Itron, Microplanet, Optimum Energy, Outback Power Systems, Schweitzer Labs, V2 Green, Verdiem, and Xantrex. Itron is the largest smart-grid meter producer in the U.S. Microsoft, which is headquartered in Redmond, recently entered the field in a partnership with its Hohm online energy management application (Sibley 2009).

Washington's interest in smart-grid development might be considered unusual in light of the 2008 study "A Smarter Grid for Washington," published by the Department of Community, Trade, and Economic Development. This study claimed that the state's historical reliance on an abundance of hydroelectric power gave it little incentive to invest in the rapid deployment of smart-grid technology and ultimately advised that Washington should let other states take the risk of early adoption and learn from their experience, despite the fact that the state has the research and development strengths that would give it an advantage in implementing a smart-grid system (State of Washington 2008a). In 2010 the state's Clean Energy Leadership Council recommended that Washington pursue smart-grid implementation; aside from repeating an assessment of the state's technological advantage in that pursuit, they also suggested that a smart grid would be able to better integrate the variable generation provided by both wind turbines and solar photovoltaic arrays (Washington Clean Energy Leadership Council 2010).

Solar. Solar power equipment manufacturing in Washington is given a 43 percent tax reduction incentive, and 2009's SB 6170 raised the state's private solar generation incentive to 30 cents per kilowatt-hour (DSIRE 2010). That act also established a separate incentive category for community or local government solar arrays (Washington State Legislature 2010f). In a more

dramatic move, permit applications were filed with Kittitas County in 2009 for the construction of Teanaway Solar Reserve, a photovoltaic array with a planned capacity of seventy-five megawatts. The developers claim that this project will generate 225 jobs over a three year construction period, ultimately establishing thirty-five permanent positions once the array is completed (PR Newswire 2010). Washington State University and Shoreline Community College have also partnered to sponsor the Northwest Solar Center. This center provides education and advocacy for communities looking to deploy solar arrays, supports the solar installation training at both schools, and operates out of a zero energy demonstration building on the Shoreline campus (Northwest Solar Center 2010).

Transportation and Energy Storage. Washington is home to several significant fuel-cell research and manufacturing facilities. The most prominent is Pacific Northwest National Laboratory, with research into both hydrogen and solid oxide fuel cells (Pacific Northwest National Laboratory 2007). Washington State University, the University of Washington, and Innovatek have partnered to develop hydrogen production processes. ReliOn is already a major manufacturer of fuel cells for backup power supplies, having sold products with a combined output of 1,450 kilowatts worldwide (Washington State University 2008b).

In 2009 HB 1481 was passed, requiring the Puget Sound Regional Council to apply for outside funding to develop an electric vehicle infrastructure for its jurisdiction, as well as directing the state Department of Transportation to prepare a pilot project for an alternative fueling infrastructure (Washington State Legislature 2010a). Later that year the Puget Sound region was selected as one of the sites for the U.S. Department of Energy's Electric Vehicle (EV) Project, which will install over 2000 charging stations to serve a deployment of over 900 Nissan LEAF cars. The state's Department of Transportation received \$1.3 million in ARRA funding to support its Electric Highway project, which will provide an electric vehicle charging infrastructure along a 276 mile stretch of Interstate 5 between Canada and Oregon. Upon projected completion in 2011, this will link the Puget Sound and Portland sites of the EV Project and serve as a component of the West Coast Green Highway Project, a program that will provide alternative fuel support for the entire length of I-5 and connect to a third EV Project site in Los Angeles (State of Washington 2010b).

Wind. The American Wind Energy Association reports that Washington ranks fifth among states in electricity generation from wind, with a capacity of roughly 1,900 megawatts and turbines with approximately 170 megawatts of capacity under construction. Most of the state's wind power generation sites came online in 2008 or 2009 (American Wind Energy Association 2009). In May 2010 an agreement was reached between Puget Sound Energy and the Siemens Renewable Energy Division to provide turbines for Phase I of the Lower Snake River Wind Project, totaling up to an additional 343 megawatts of production capacity (Puget Sound Energy 2010). Two factors, however, make the future of wind power in Washington somewhat uncertain. First, the Northwest Power and Conservation Council's 2007 report on wind claimed that insufficient data on the wind potential of the region existed to make reliable projections about the economics and logistics of further developing generation capacity (Northwest Power and Conservation Council 2007). Second, there have been ongoing concerns about how to integrate the intermittency of wind energy into the region's transmission

infrastructure and demand schedule. Implementation of a smart grid has been suggested, but no decisive steps have been taken so far.

Seattle

Sustainability Plans. Seattle has long been at the forefront of urban sustainability issues. Metro King County Transit has earned a leadership position for its use of hybrid-electric buses and biodiesel fuels, and Seattle City Light, a department of the city government that provides electricity to the city, has been a consistent leader on a wide range of environmental initiatives, including its status as the country's first carbon-neutral electric utility. In 2005 former Mayor Greg Nickels announced the Seattle Climate Protection Initiative, which would reduce the city's carbon emissions to seven percent below 1990 levels by 2012, and he subsequently led a similar initiative within the U.S. Conference of Mayors that by 2009 had achieved commitments from over 900 cities representing more than eighty million Americans. Although the mayor's environmental initiatives were popular, in 2009 he was defeated in a primary election and was ultimately succeeded by Mike McGinn, former head of the local Sierra Club chapter. McGinn's campaign platform included opposition to a \$4.2 billion downtown tunnel and support of transit-oriented development and green jobs programs. McGinn also promised grassroots participation and a strengthening of the neighborhoods, in contrast with Nickels' more centralized leadership style, and he was able to win based on a volunteer campaign.

The city's current comprehensive plan was released in 2005 and is currently undergoing revision for a new edition in 2011. As of now, there are no explicit green job goals in the plan, but the plan does explicitly attempt to balance economic development with environmental stewardship through what it calls the "urban village strategy." The strategy aims to cultivate neighborhood sectors that provide a broad spectrum of housing and employment opportunities, one effect of which would be to reduce the need for lengthy commutes or private vehicle use in many cases, while enhancing civic engagement and responsibility for the community environment (City of Seattle 2005).

Green-Building Initiatives. In 2008 Mayor Nickels also announced plans to make the city the country's "green building capital" based on energy-efficiency improvements, and he formed the Green Building Task Force. A year later the task force issued a report with a variety of goals, including a plan for financing residential energy-efficiency improvements as a source of green jobs. In 2009 Seattle launched the Green Building Capital Initiative, which provides inexpensive home energy audits and incentives to improve building efficiency for residential and business buildings. The program's goal is to audit 5,000 homes within eighteen months (Muro and Rahman 2009). In addition, a city government ordinance passed that year (CB 116731) expanded on the state government requirements for the greening of buildings. The following year the city passed the Energy Disclosure Ordinance, which requires owners of large buildings to report on energy use and ratings for tenants, buyers, and lenders. Also in 2010 the city received a \$20 million grant from the U.S. Department of Energy through its "Retrofit Ramp Up" program, funding the city's Neighborhood Weatherize Every Building Initiative, which is projected to create 2,000 "living wage green jobs" (City of Seattle 2010). Seattle's Department

of Planning and Development also offers a priority building permit program for projects that meet certain sustainability criteria (City of Seattle 2009b).

Green Jobs Training. Seattle offers a wide range of green jobs training programs, but they are based mainly in the community colleges, technical schools, and the local of the Laborers' International Union of North America (Houghton 2008). The city of Seattle also has a partnership with the Environmental Outreach and Stewardship Alliance, which provides green jobs training and weatherization services.

Green Business Initiatives. In 2007 Mayor Nickels launched the "industrial jobs initiative," which supported easier permitting and other efforts to recruit and retain businesses in a wide range of industries, including clean tech. For example, in 2009 the engineering and construction firm McKinstry Company received a permit from the city to allow an expansion of their Innovation Center that would create 500 new jobs in energy efficiency (City of Seattle 2009a). In May 2010 McKinstry reached a lease agreement for space in this facility with two emerging energy companies, General Biodiesel and Hydrovolts (McKinstry 2010). The firm provides a model of "good green jobs" because of its use of labor unions and focus on serving its employees, and many of its projects involve retrofitting buildings. The firm's head, CEO Dean Allen, has referred to himself as "Dean the Plumber," a blue-green alternative to the nationally known figure of Joe the Plumber. At a broader, four-county scale, the Puget Sound Regional Council developed the Prosperity Partnership, which has supported building a clean-tech cluster as part of its cluster-based industrial development strategy. One of the goals of this cluster is developing a product testing and demonstration space to assist in the commercialization of clean technology research (Puget Sound Regional Council 2005).

City Society Organizations and Policy

The predominant civil society organizations in Washington that are interested in clean energy and the green economy are tightly linked in cooperative regional-level networks. The Northwest Energy Coalition has over 100 member organizations spanning Washington, Oregon, Idaho, Montana, Alaska, and British Columbia. It is partnered with the Northwest Energy Efficiency Council, the Northwest Energy Efficiency Alliance, the Renewable Northwest Project, and the Northwest Sustainable Energy for Economic Development (SEED) group. The SEED group offers consulting services for communities and energy advocates, the Council is a trade association for energy-efficiency businesses, and the Alliance is a utility-funded group that offers educational and planning services in cooperation with the other groups (Northwest Energy Coalition 2010, Northwest Energy Efficiency Alliance 2010, Northwest Energy Efficiency Council 2010, Northwest SEED 2010, Renewable Northwest Project 2010).

The Washington Environmental Council also works with those organizations, and it also provides voter education on environmental and energy issues for citizens in the state (Washington Environmental Council 2010). Another of their allies in the region is Climate Solutions, a nonprofit that focuses on promoting clean transportation and energy initiatives, such as the national iSky project that developed from their collaboration with the Washington Environmental Council (Climate Solutions 2010). One of the major industry partnerships in the

state is the Washington Clean Technology Alliance, which includes companies like McKinstry and Battelle as well as Washington State University, the University of Washington, Puget Sound Energy, and the City of Seattle. (Washington Clean Technology Alliance 2010). The Puget Sound Clean Cities Coalition is a geographically and topically more narrow group, working with the governments of Seattle, King County, and many nearby cities to replace petroleum with cleaner and more renewable vehicle fuels. It offers grant application assistance to its members, which has resulted in \$15 million in ARRA funding being awarded for distribution among several of its programs (Puget Sound Clean Air Agency 2009).

Further Reading

Washington State University's Extension Energy Program has an immense online database of energy-related reports, software, state code documentation, and legislation analysis (www.energy.wsu.edu). Seattle's Office of Sustainability and Environment offers substantial resources for citizens looking to learn about policies, sustainable practices, and opportunities for community involvement (www.seattle.gov/environment/). All of the civil society organizations listed above also maintain a strong online presence in tracking green issues through the news, publishing their own reports and proposals, and organizing community events.

Acknowledgements

We thank the following for interviews and/or comments on the draft: Dr. Alan Hardcastle (WSU Extension Energy Program), Beckey Kelley (Washington Environmental Council), and Tom Ranken (Washington Clean Technology Alliance).

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