

An Inventory of Renewable and Efficient Energy in Oregon

Compilation of a statewide inventory of sustainable energy development efforts, their status, and primary contact information to better assist companies in connecting with communities and workforce development agencies.

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Inventory of Renewable and Efficient Energy in Oregon

Introduction

In Oregon, both the public and private sectors are making increasing commitments to development of renewable and efficient energy resources. Entrepreneurs and companies are starting and expanding clean energy businesses, or retooling other types of businesses to be more energy efficient. Independent industry sectors have created working groups for solar, wind, geothermal, small hydro and fuel cell interests.

On the public front, there is a myriad of federal agencies that now provide grant, loan and tax incentive opportunities for clean energy development. The Oregon State Departments of Energy, Economic and Community Development, Environmental Quality, Labor, Community Colleges and Workforce and the Oregon University System are all involved in some aspects of renewable energy and energy efficiency. Regional economic development agencies and workforce boards are focusing attention on this sector. Recently, county and city governments across the state have begun offering special programs and incentives for clean energy companies.

All of this leads to increased opportunities, but also increased confusion for both energy entrepreneurs and communities wishing to implement clean energy projects. Lack of comprehensive information sources leads to missed opportunities to share knowledge and leverage resources between industry sectors and local communities that are endeavoring to develop energy projects.

An Inventory of Renewable and Efficient Energy in Oregon provides a comprehensive inventory of Oregon's renewable energy and energy efficiency resources, development efforts, and primary contacts at key agencies and projects. It is intended to be a tool to assist communities and companies in understanding clean energy developments happening around the state that may provide knowledge and resource leveraging opportunities. This report is designed to simplify the process of identifying clean energy related funding opportunities and workforce and business development resources.

This report includes chapters on Oregon's overall renewable energy status, local through federal financial incentives, employment and training resources, and key contacts. The final chapter provides information about significant on-the-ground case studies in each clean energy sector.

In 2007, 3EStrategies was commissioned by the state of Oregon to coordinate development of clean energy workforce resources to meet near term employment needs for clean energy companies. Our initial report, *An Analysis of Clean Energy Workforce Needs and Programs in Oregon* can be found at www.3estrategies.org. Following that work, Oregon State contracted 3EStrategies to begin implementing strategies to address the workforce gaps identified in the report noted above and to develop this inventory. These efforts were funded by the Governor's Strategic Training Fund.

An Inventory of Renewable and Efficient Energy in Oregon is currently available in pdf format. 3EStrategies is exploring the possibility of using this information to populate a robust, comprehensive on-line guide. This would be particularly valuable as new federal energy-related programs and stimulus funds are being put forward – stay tuned.

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I. Renewable Energy and Energy Efficiency Status in Oregon

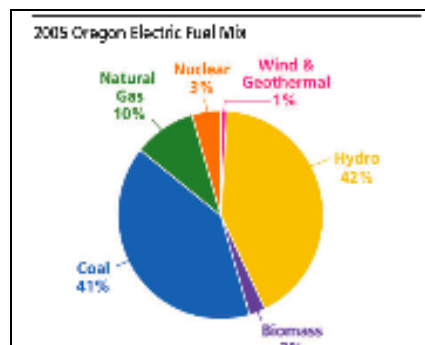
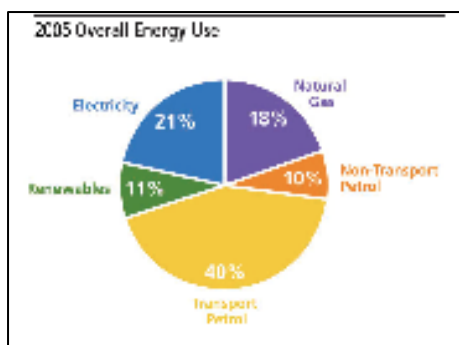
Overview

The Oregon Department of Energy (ODOE) reorganized and created a Renewable Energy Division in July 2005. The mission of the Renewable Energy Division is to encourage greater use of renewable energy and alternative fuels in Oregon. Policies that increase renewable energy usage and development and attract renewable energy manufacturers are the focus of the Division.

The Renewable Energy Division brings together technical experts and policy advisors, who focus the Department's efforts on developing renewable energy projects. This includes helping customers use the state's tax credit and loan programs, navigate the siting process, and secure federal funds and utility and other incentives.

The Renewable Energy Division has oversight of the Oregon Renewable Energy Action Plan (REAP), which was released in 2005 (see <http://www.oregon.gov/ENERGY/RENEW/docs/FinalREAP.pdf>). The purpose of the REAP is to encourage and accelerate the production of energy from renewable sources, thus stimulating economic development and reducing environmental impacts of fossil fuel energy source. The plan sets specific long- and short-term goals for energy use and conservation, electricity generation and transportation fuels. The plan calls for and has seen broad actions throughout state agencies to encourage implementation of renewable energy.

Oregon has taken a strong legislative action creating a solid foundation upon which to build an economy strengthened and fueled by clean renewable energy. Oregon law requires electric utilities to buy excess power from customers with small solar, wind or hydroelectric systems. Utilities also must purchase excess power produced by small fuel cells, which can run on natural gas or methane, a biomass byproduct. In 2007, a Renewable Portfolio Standard (RPS) and Renewable Fuels Standard (RFS) was enacted. The RPS requires that at least 25 percent of new energy resources must come from renewable sources, and when combined with our existing sources of electricity, will ensure that by 2025. The RFS mandates biodiesel and ethanol in Oregon's motor fuels once production capacity levels for these products are met, and requires the Oregon Department of Agriculture (ODA) to study and monitor ethanol fuel production, use, and sales in Oregon and to implement the RFS. (See Appendix A for a list of renewable energy legislation passed in 2007.)



The most current figures at the time of publishing this document indicate that renewable resources account for 11% of Oregon's total energy usage. While we possess robust hydro-electric resources that provide 42% of our electricity load, in and out of state coal-fired power plants still account for a majority of our electrical usage with wind, geothermal and biomass renewables comprising the smallest slivers of Oregon's electricity pie. However, as the remainder of this report will show, the

state is making significant progress in maximizing its conservation and energy efficiency efforts and developing new renewable energy projects. (See Appendix B for an ODOE Renewable Energy contact list.)

Renewable and Energy Efficiency Resources

Oregon possesses a unique diversity of energy efficiency and renewable energy resources and companies including solar, wind, geothermal, small scale hydroelectric, biomass (wood and organic solid waste), ocean energy, fuel cell and biofuels.

Energy Efficiency / Conservation

The authors consider conservation to be the foundation of any sustainable energy plan. Certainly Oregon has a history of strong conservation policies. The Oregon Department of Energy heads these efforts by providing educational information and offering direct assistance through a variety of programs and incentives that encourage Oregonians to conserve energy.

Since 1978, three years after the creation of ODOE, the Department's programs have saved enough electricity, natural gas, oil, wood, and diesel to meet the energy needs of about 677,000 Oregon homes. Oregonians who have invested in energy conservation through ODOE programs cumulatively save approximately \$733 million annually. (ODOE, Energy Plan 07-09)

Electric energy conservation has increased significantly in recent years. Since the 2000-2001 biennium, electric energy savings from the Business Energy Tax Credit (BETC) program have quadrupled, and savings from the Residential Energy Tax Credit Program have doubled.

This dramatic increase in electric energy savings can be attributed to several factors, including:

- Energy prices have increased significantly. Between 2000 and 2005, average Oregon electricity rates increased 28 percent, average natural gas rates increased 63 percent and retail gasoline prices increased 48 percent. During this same period general U.S. inflation was 13 percent. (ODOE, Energy Plan 07-09)
- Energy efficiency efforts have expanded, in part due to legislative action. This includes raising the cap on individual projects eligible for the Business Energy Tax Credit (BETC) to \$10 million, and establishing a tax credit pass through mechanism to allow many nonprofits, public agencies and tribes to benefit from the BETC.
- Creation of the Energy Trust to help fund electric conservation projects.

Biomass:

Biomass resources include wood, plant and animal waste, other organic matter, or gasses from the decomposition of that matter. In Oregon, biomass provides fuel for electricity generation, heating and transportation. In 2004, biomass provided 79 trillion Btu of energy or approximately 6 percent of Oregon's total energy supply. More than 90 percent of Oregon's biomass energy comes from forest or urban woody biomass and paper mill pulping liquor. The remaining biomass energy is from landfill and wastewater treatment gas, or waste grease and seed oils converted to biodiesel.

An assessment by the Oregon Department of Energy analyzed forest and agricultural resources in detail for potential electricity generation and ethanol production in Wallowa, Union and Baker counties. The findings reveal that there exists more than 50 megawatts of sustainable energy

opportunity in those three counties alone. The report showed the use of biomass for electric power generation or ethanol production would have net economic benefits, including an estimated six jobs created for each megawatt of biomass power capacity that is installed.

ODOE and the State of Montana are collaborating to fund research and prototype demonstration of enzymatic cellulose-to-ethanol production. Current work proves that cellulosic ethanol is cost competitive on an energy content basis to produce ethanol using Oregon grass seed straw, when petroleum is \$3.50 per gallon (State of Oregon Energy Plan 2007-2009). Further development of this enzymatic market, as well as the dilute and strong acid cellulosic conversion technology, is to be undertaken in Oregon. Oregon State University (OSU) has pioneered a new microchannel reactor (engineering on a small scale) that has proven to substantially reduce biodiesel production costs. ODOE and OSU are identifying ways to accelerate that fuel production market.

Woody Biomass

Biomass facilities produce electricity and heat or steam from wood and fiber-laden pulping liquor at paper mills. About 40 percent of Oregon biomass energy comes from wood waste burned at 49 industrial sites. In addition to producing steam and process heat for heating applications, ten of these sites generate electricity totaling approximately 866,000 megawatt-hours (MWh). Another 46 percent of the total biomass energy comes from combustion of pulping liquor at six pulp mills.

Biogas from Waste Biomass

Three landfills in Oregon tap waste methane gas to generate 37,000 MWh of electricity and provide industrial fuel, with a fourth under construction in southern Oregon. The U.S. Environmental Protection Agency's Landfill Methane Outreach Program has identified five landfills in Oregon as "candidate" landfills for production of electricity from landfill gas. However, the EPA selected these candidate landfills based on national data sources rather than on-site evaluation, and more detailed assessments are needed to determine the economic feasibility of developing power generating facilities at any of the identified landfills. Additionally, 29 wastewater treatment plants use methane to generate 26,000 MWh of electricity and provide heat for sewage treatment. Finally, two large dairies produce about 500 MWh of electricity from cow manure.

The Oregon Department of Energy maintains an inventory of Oregon biomass energy facilities, their biomass use and energy production.

(See: <http://egov.oregon.gov/ENERGY/RENEW/Biomass/BiomassHome.shtml>)

Ethanol and Biodiesel Fuels from Biomass and Crops

Biomass can be used to produce biofuels for transportation or stationary equipment. Ethanol and biodiesel are the most commonly used in Oregon. Ethanol is an alcohol fuel primarily distilled from corn. Biodiesel is an ester of alcohol with characteristics of petroleum diesel. Canola, rapeseed, mustard, soy and other crops, along with waste grease from the food service and food processing industry, can be refined into oil suitable to fuel diesel vehicles and oil furnaces, and to be used as a lubricant.

Ethanol is the main oxygenate additive in Oregon's fuel supply. It is blended with gasoline at a concentration of up to 15 percent. In 2006, Oregonians used more than 95 million gallons, up from 60 million gallons in 2002. This represents just less than five percent of Oregon's gasoline supply.

The ethanol was produced in the Midwest. However, Pacific Ethanol, at the Port of Morrow, began producing ethanol in 2007. Oregon's summer nighttime temperatures are too low to grow the high sugar content corn found in the Midwest. Several new ethanol production plants are either planned or under construction in Oregon. The plants may use local soft wheat or barley or Midwest corn.

In 2006, 2007, and 2008 Oregonians used approximately 2.5, 5, and 3.5 million gallons of biodiesel respectively. A small portion of that fuel is produced from soy and imported from the Midwest. Ever increasing however, are the millions of gallons of biodiesel produced in Oregon from regional feedstock. In 2005, a Salem refinery plant opened and began producing biodiesel with capacity thresholds exceeding one million gallons per year. The plant has since expanded, and in October of 2008 commenced shipping of biodiesel from the new, five million gallon per year (Mgy) facility. They are ramping production and anticipate being on target by summer of 2009 to hit 5 Mgy. The plant produces recycled cooking oil, canola and camelina-based biodiesel. This Oregon biodiesel is blended with various percentages of petroleum diesel before being used as a transportation fuel, and to a lesser extent, to replace home heating oil.

Attaining and sustaining statewide 5 Mgy production capacity is a very important threshold due to stipulations within the renewable fuel standard (RFS) mandate passed in 2007 as a part of House Bill 2210. Once Oregon production capacity from regional feedstocks totals 5 Mgy and is sustained at this capacity for three months, a B2 biodiesel blend is required in Oregon diesel.

The Salem facility can secure the required regional feedstock and now has a facility capable of producing 5 Mgy and thus triggering the RFS. They are, however, experiencing restricted access to market blending stations and distribution terminals delaying the triggering of the RFS.

Several other biodiesel facilities ranging from 10-to-40 million gallons per year are planned. The plants could use imported Midwest soy oil and jatropha or palm oil. Biofuel suppliers are developing an Oregon customer base of public and commercial fleets.

In late 2006, SeQuential Biofuels opened the first retail station in Oregon dedicated to biofuels. The Eugene station sells biodiesel-petroleum blends of B-5 (or 5 percent biodiesel), B-20, and B-99. It also sells ethanol-gasoline blends of E-10 (or 10 percent ethanol) and E-85. (See Chapter 5, *Case Studies* for additional information).

The State of Oregon Department of Administrative Services (DAS) buys B-20 for the state fleet and used 150,000 gallons in 2006. The DAS motor pool operates two E-85 fueling stations and fuels all of its flex-fuel vehicles with E-85, exceeding 50,000 gallons of E-85 per year. Flex-fuel vehicles can run on either E-85 ethanol or petroleum gasoline. Oregon is working with California, Washington and fuel suppliers to develop public access biofuel stations along the I-5 corridor.

Geothermal

Geothermal resources include high-temperature (100 degrees Celsius or 212 degrees Fahrenheit and higher) for electricity generation, intermediate temperature (100 – 50 degrees C) for industrial, agricultural and municipal applications and low-temperature heat pump applications. Oregon's geothermal potential is third in the continental U.S. behind only Nevada and California. Nearly the entire state east of the Cascade mountain range has ample low- to mid-temperature geothermal resources for direct-heat applications. This is especially true of the south and southeastern portions of the state. Most areas of high heat flow are in the Cascades, central and southeast Oregon, and parts of northeast Oregon.

As a result of this tremendous resource, Oregon has approximately 2,200 thermal wells and springs that furnish churches, schools, homes, communities, businesses, and facilities with 500 to 600 billion Btus of energy per year. From the beginning of the residential tax credit in 1978 to the end of 2005, about 2,200 ground-source heat pumps had received a tax credit for space and water heating. Geothermal sources elsewhere in Oregon supply heat for buildings, swimming pools, resorts and industrial uses. All of these applications fall into the “direct use” category, as opposed to geothermal for electricity generation.

Although Oregon currently generates no geothermal electricity, it has several areas that are likely to produce electricity, seven of which have been designated as prime areas for exploration. It is estimated that the state’s high-temperature geothermal areas have the potential for about 2,200 megawatts (MW) of electric power. (DOE 2005). Geothermal electric generation could provide important renewable base load generation, a constant source of electricity. Geothermal experts consider the area outside the Newberry National Volcanic Monument to be a commercial prospect for high-temperature geothermal electricity production in the Pacific Northwest. To date, limited exploration drilling has measured temperatures up to 315 degrees C. Interest in commercial power generation is occurring in Lake and Malheur counties as well.

By fully developing its 2,200 MW of electric potential from high-temperature geothermal areas, Oregon could generate approximately 18.3 billion kilowatt-hours of electricity per year. This is enough electricity to supply about 2 million homes with their electrical needs or nearly 40% of the state’s current electricity consumption.

Hydroelectricity

In a normal water year, hydropower meets about 44 percent of Oregon’s electricity demand. Additional large hydro would be a small player in any likely generation growth scenario. There is, however, an ongoing resurgence of interest in small hydro in Oregon, especially in irrigation districts, due to ease of adding power onto existing facilities. The future of hydropower lies in developing micro-hydro (or “seasonal” hydro) systems as additional components to piped irrigation systems. Run-of-the-river technology, which involves no storage and does not reduce river flows, could also make a contribution in many areas of rural Oregon. For entities exploring upgrades, changes or conservation measures for irrigation or water delivery systems, a hydroelectric installation may help offset costs while providing a new source of revenue.

Ocean Energy

The Oregon coast has strongly competitive wave resources in close proximity to readily available coastal substations providing one of the best locations in the United States to develop wave energy. Old logging substations and facilities that have been taken offline can be easily renovated to handle the large electrical loads that will be generated from wave production. Additionally, Oregon has the highly skilled and capable metals manufacturing industry necessary for the production of emergent technologies.

Wave energy technology today is being compared to wind energy technology 15-20 years ago. Due to the changing socioeconomic environment, it is believed that the industry will be able to come to scale, implementing refined technologies, more quickly than was possible with wind. Researchers say that the ocean is the largest, most concentrated source of renewable energy on Earth, and the potential for wave energy in Oregon is enormous. It could provide 10 percent of the state’s electricity needs by 2025 (Clean Edge 2008).

There is incredible opportunity for Oregon to emerge as a world leader in the production of renewable ocean wave energy, growing and attracting businesses and jobs and spurring clean energy investment. As such, the Oregon legislature has developed the Wave Energy Initiative for research and development of this new and emerging industry, launched the Oregon Wave Energy Trust (OWET) and worked closely with Oregon State University in developing the nation's first Wave Energy Center.

OWET has received the first part of its \$4.2 million budget approved by the 2007 state legislature, and is moving ahead with plans and activities to make Oregon a global leader in this emerging industry. "The state's investment is aimed at addressing the challenges facing the industry, which include education and outreach, understanding potential environmental effects, responding to existing use conflicts, research and development, and state-wide planning," said OWET's former acting Director Justin Klure. "The top priorities are determining potential ecological effects and working with existing ocean users to develop a plan to share the use of the ocean."

The Trust has funded a whale migration study, ecological impact workshop and community outreach. In the future, they are finding means of streamlining permitting, securing funding and increasing technology development. Wave energy technologies and applied research and development activities will be supported at OSU, as they seek to develop a National Wave Energy Center and test new wave energy devices.

(See <http://www.oregonwave.org/inde.php/wave-energy/12-wave-energy.html>)

Solar

Solar energy is Oregon's largest renewable energy resource (ODOE Energy Plan 07-09). Northwestern Oregon receives roughly the same solar resources as the national average and that of Europe. The eastern and southern parts of Oregon receive roughly the same annual solar resource as that of northern Florida.

There are three primary means by which solar energy is harvested in Oregon: as direct light into buildings for light and heat; to heat water using roof-mounted collectors; and to convert sunlight to electricity using photovoltaic panels. Each solar harvesting approach is unique with its own technology and market constraints. The life-cycle cost can be lower than conventional energy sources if solar is installed when the building is constructed.

Passive solar, which includes using solar directly in buildings for lighting, heating and cooling can improve occupant comfort and reduce energy needs by up to 40 percent. Solar water heating has gained momentum in Oregon. Residents have installed more than 17,600 solar water heating systems in the last 25 years. Solar photovoltaic (PV) electric systems are virtually maintenance free, have warranties in excess of 25 years and can directly interface with the utility grid. The world market for solar electric power is doubling every 24 months. With each doubling, the manufacturing cost has fallen by 18-22 percent. (ODOE, Energy Plan 07-09)

In addition to supporting market developments, Oregon has recently been able to attract large manufacturers of solar photovoltaic technology including Solar World, Solaicx, PV Powered, Peak Sun Silicon, Mr. Sun Solar and, most recently, the announcement of proposed Intel spin-off SpectraWatt Inc. Solar World's Hillsboro plant is largest solar cell production facility, in terms of MW produced, in the USA.

Wind

Wind-generated electricity is becoming increasingly cost competitive with conventional fossil fuel

resources as technological efficiencies increase, the price of natural gas increases, and the federal wind production tax credit continues. Oregon now has several large and many smaller wind projects. Total operating capacity as of winter 2008 was approximately 817 MW, enough electrical energy to power over 200,000 homes.

Many new wind projects and expansions are in various stages of review and development. Recent and ongoing additions to Oregon's renewable wind power resource development include:

- 823 MW under construction
- 1,849 MW approved and pending construction
- 952 MW under review

This development is taking place primarily in the central and eastern Columbia River area and in northeastern Oregon. These numbers bring the total of pending, approved, under construction and constructed to 4,441 MW of renewable energy from wind. This is enough electrical energy to power over 1,000,000 homes and quickly approaches the capacity needed to meet Oregon's 2025 RPS goal of meeting 25 percent of electricity sales with new renewables.

Turbine procurement and transmission capacity between eastern and western Oregon remains an important barrier for further large-scale development of wind. Approximately 3,000 turbines are associated with the aforementioned 4,441 MW of wind energy. The required transmission and integration of large wind capacity with variable power output into the power grid is of concern as well. A group of energy stakeholders evaluated this issue in 2006 for the Northwest Power and Conservation Council and BPA. They found, among other things, that the 6,000 megawatts of wind expected to be operational by 2024 should be able to use the region's existing transmission system. However, this remains a hotly contested issue. Reliable power system operation requires balance between load and generation and the continued integration of variable wind power combined with multiple regional transmission operators introduces uncertainty to these projections.

Smaller locally owned or community-owned wind farms are also under development in various areas of the state. The economics of smaller projects are more challenging due to the higher cost of installing small numbers of utility-scale wind turbines. But local economic benefits are potentially higher with such developments than the large wind farms.

Fuel Cell

Fuel cells use the chemical energy of hydrogen to generate electricity. When pure hydrogen is used, the only by-products are pure water and useful heat. Fuel cells are unique in terms of the variety of their potential applications; they can provide energy for systems as large as a utility power station, as small as a laptop computer, and just about everything in between, including light cars and trucks.

Although not new in concept, fuel cells have received considerable attention lately for their potential as clean and reliable electricity generating devices. Fuel cells cannot yet compete economically with more traditional energy technologies, but rapid technical advances are being made. Through partnerships with the private sector, U.S. Department of Energy seeks to develop the technologies needed to make it practical and cost-effective for large numbers of Americans to choose to use hydrogen fuel cell vehicles by 2020.

Oregon-based fuel cell manufacturers are currently serving markets on five continents with backup, portable and stationary applications of fuel cell technology. Fuel cells will certainly see continued adoption in future decades as fuel storage technologies advance and manufacturing costs come down.

II. Local, State and Federal Incentives Available to Oregon Businesses Engaged in Renewable Energy and Energy Efficiency

This chapter serves as a comprehensive overview of existing financial incentive programs to assist renewable energy and energy efficiency projects in Oregon. It aims to connect emerging renewable energy and energy efficiency technology entrepreneurs and industries with funding sources.

Incentives include tax credits, cash payments, grants and loans. These exist on the federal, state, and local levels and can often be combined across these tiers on individual projects. The authors highly recommend that readers consult <http://www.dsireusa.org> for supplemental information on state and federal energy-related financial incentives.

Local-Level Financial Incentives

Government-Sponsored

The following local incentives are available in certain counties and cities.

Construction in Progress: Throughout Oregon, most projects to erect or enlarge a building may be exempt from property taxes for up to two years, while under construction. Exemption also applies to on-site equipment being installed as real property. Land is not eligible. Contact the local county assessor for further eligibility and application form.

Investment Advantage Program: A new state income tax exemption program, offering a 10-year state income tax holiday, that helps businesses start or locate in certain Oregon counties. Only available in certain (mostly rural, lower-income) counties.

Small City Taxable Income Exemption for Business Development: This program provides a 10-year exemption from Oregon income tax for qualified facilities. However, to be eligible the facility must, in addition to gaining city and county approval, be located in a city of less than 15,000, and in a county which experienced increasing unemployment and falling per capita income in one of the two prior years. To qualify, the facility must be certified by the Economic and Community Development Department. As a first step, contact the city/county. (This benefit is apart from any Enterprise Zone benefit that may also be available.)

Strategic Investment Program (SIP): Provides a 15-year property tax exemption for very large projects, typically more than \$100 million.

- Locally approved 15-year property tax exemption of all investment value over \$100 million in urban areas, or \$25 million in rural areas.
- Company pays a community service fee equal to 25 percent of the exemption, up to a yearly maximum of \$2 million in urban areas or \$500,000 in rural areas.
- Exemption is also available with pre-established local requirements and approval, if project will locate in a designated Strategic Investment Zone.

Enterprise Zones: Enterprise zones (“EZ”) in Oregon are established by state statute but administered by the county or city sponsoring the specific EZ. The basic benefit of EZs is exemption from property tax for a designated number of years (generally three to five) for investments in new plant and equipment. There are currently 59 enterprise zones across Oregon: 48 rural and 11 urban. Some EZs (such as Jefferson/Madras and Crook/Prineville) have “Super Enterprise Zone”

status and may offer property tax exemptions up to 15 years. “Super” status is only available in the most rural zones. Some EZs have additional local incentives, including waivers or reductions in certain municipal fees. EZ benefits are not automatic and must be applied for.
(See: <http://www.oregon4biz.com/enterthezones>)

Rural Renewable Energy Development Zones: Rural Renewable Energy Development Zones (RREDZ) are a form of local-level, government-sponsored financial incentive that function like enterprise zones and offer very similar property tax exemption benefits. RREDZs however, are designed to assist in the development of renewable energy projects and businesses. They are designed to encourage wind, geothermal, solar, biomass, and ocean energy; distribution or storage of biofuels; and the generation of electricity from a renewable energy source.

RREDZs are eligible for the same property tax exemption benefits as Enterprise Zones, which are intended to create new jobs in economically lagging areas. As of 2007, any county or city is permitted to be a RREDZ except for areas of the county inside the urban growth boundary of a metropolitan area, or cities of 30,000 or more in population.

Incentives

Enterprise Zone Incentives (RREDZs are eligible for these benefits):

- New Plant and Equipment is 100% property tax-exempt for a three-year term if employment increases within the zone by at least one person or 10% based on existing employee average over the last 12 months.
- Extended Abatement – an exemption for up to two additional consecutive years is available if certain wage, zone and local requirements are met.

Additional Incentives for RREDZ:

- Exempt up to \$250 million of initial real market value in qualified property per project (or lower cap depending on sponsor). The cap was increased from \$100 million in 2007.

Current RREDZs

During the summer of 2008, 3Estrategies conducted a survey of existing and upcoming renewable energy projects in each of the RREDZs. Existing projects were surprisingly fewer than expected, with only five projects currently in operation and utilizing RREDZ (four wind projects and one biomass). The majority of prospective RREDZ projects are in early or investigatory stages (a total of 19 projects), about half of which have been approved. For most projects, information such as employee counts and investment costs were not yet available as public information. Currently, wind is, by far, the most dominant renewable energy sector utilizing RREDZs, with incentives being pursued in 14 of the 19 future projects documented.

As of July 2008, eight of Oregon’s 36 counties have been designated RREDZs: Union, Harney, Wasco, Sherman, Malheur, Polk, Linn and Crook.

(See Appendix C for full list of RREDZs.)

Current Rural Renewable Energy Development Zones

Jurisdiction(s) Comprising/Sponsoring RRED Zone	Designation		Authorized Exemptible Value*	
	Effective Date	Director's Order	Originally	Lately
Union County	Sept. 6, 2005	DO-05-132	\$100,000,000	\$100,000,000
Harney County	May 15, 2006	DO-06-149	\$100,000,000	\$100,000,000
Wasco County	June 22, 2006	DO-06-151	\$100,000,000	\$100,000,000
Sherman County	Aug. 29, 2006	DO-06-159	\$50,000,000	\$50,000,000
Malheur County	Aug. 31, 2006	DO-06-160	\$100,000,000	\$100,000,000
Polk County**	Jan. 18, 2008	DO-08-178	\$100,000,000	\$100,000,000
Linn County**	April 7, 2008	DO-08-179	\$250,000,000	\$250,000,000
Crook County	April 29, 2008	DO-08-183	\$250,000,000	\$250,000,000

* In terms of initial real market value (RMV) of project property on January 1 of the first full year of service.

** Excluding metropolitan/large city urban growth areas.

Despite the attractive financial incentives available in the RREDZs, upstart activity, overall, has been somewhat lackluster. According to Arthur Fish, Business Incentives Coordinator for Oregon Economic & Community Development's Business and Trade Division, the most active of these zones has been Sherman and Wasco which have each seen approximately \$15 million in new capital investments since designation in summer 2006.

RREDZ Renewable Projects Activity

RREDZ County	Existing Projects		Approved and In Process		Upcoming Projects	
	# of Existing Projects	# of Existing By Type & Total Power Capacity	# of Projects In Process	# In Process By Type & Total Power Capacity	# of Upcoming Projects	# of Upcoming By Type & Total Power Capacity
Union	2	1 Wind: >100MW 1 Biomass	0	-	0	-
Harney	0	-	4	2 Wind: Est. 200MW 2 Biomass: 80- 90MW	4	4 Wind: Est. 400MW
Wasco	0	-	2	2 Wind: Est. 70MW	0	-
Sherman	3	3 Wind: 475MW	3	3 Wind: 565MW	2	2 Wind: Est. 400MW+
Malheur	0	-	0	-	0	-
Polk	0	-	0	-	0	-
Linn	0	-	1	Biomass: trash to pellets	0	-
Crook	0	-	0	-	3	1 Wind: Est. 120MW 2 Biomass
TOTAL RREDZs	5	4 Wind: >575MW + 1 Biomass	10	7 Wind: 835MW + 3 Biomass	9	7 Wind: >920MW + 2 Biomass

A map of Oregon's Enterprise Zones is available at the Oregon Economic & Community Development Department's website. (See <http://www.oregon4biz.com/enterthezones>)

Non-Government Sponsored

Bonneville Environmental Foundation (BEF): Funds may be available for grants, loans, and direct investments in renewable energy projects. Projects that generate electricity are preferred; acceptable projects include solar photovoltaic, solar thermal electric, wind, hydro, biomass, and animal waste-to-energy.

Energy Trust of Oregon: Energy Trust of Oregon is an independent public purpose organization dedicated to energy efficiency and renewable energy generation. It offers a wide array of financial incentive programs targeting businesses as well as residential homeowners, but is available *only* to Oregon customers of Pacific Power, Portland General Electric, Northwest Natural Gas and Cascade Natural Gas. It is funded by customers of those utilities.

Contractors, installers, manufacturers, and distributors interested in working with Energy Trust are encouraged to become recognized trade allies. Contact Energy Trust at www.energytrust.org, 1-866-368-7878 or via email at info@energytrust.org to find a local representative.

Local Utilities: Many local utilities have various financial incentives, grants, loans and/or rebate programs, which may be available to commercial as well as residential customers, especially those who generate electricity using solar photovoltaic systems. For a link to a list of all Oregon utilities and their contact information, see <http://www.oregon.gov/ENERGY/Power.shtml>.

ShoreBank Enterprise Cascadia is a non-profit Community Development Financial Institution, serving urban and rural communities of the Pacific Northwest. It is an affiliate of ShoreBank Corporation, providing loans and technical assistance to small businesses and non-profits in natural resource dependent communities. For more information, see <http://www.sbpac.com>.

Oregon State-Level Financial Incentives

State-level financial incentives consist of funds, loans, and tax credit programs. What follows are brief synopses of the various programs, and contact information for the respective administering body. In addition to administering defined programs, these agencies often assist in isolating the proper combination of financial incentives for specific projects.

Oregon State-Level Loan Programs

The Oregon Department of Energy (ODOE) or the Oregon Economic & Community Development Department (OECDD) administers most state-level loan programs in Oregon.

- ODOE provides tax credits and low-interest loans for renewable resource projects. Large wind, geothermal and biomass facilities also qualify for federal production incentives. Allows for Oregon residents and businesses to invest in renewable energy generation and utilization.
- The OECDD programs are generally open to a wide variety of firms, and are not targeted specifically to renewable energy. OECDD's Business Development department staffs Business Development Officers statewide, by county, with specialists who administer and assist in loan programs for businesses and communities in Oregon.

Below is a synopsis of the programs most likely to be of interest to those involved in renewable energy and energy conservation/efficiency projects. (See Appendix D for a listing of OECDD Business Development officers.)

Business Development Fund: A “regular” fund provides long-term “gap” loans; a “targeted” fund provides loan financing for companies located or expanding in certain distressed areas. Loans are available up to the lesser of \$500,000 or 40% of project cost; funds are to be used for real estate, equipment, or long-term working capital. Manufacturers, processors and certain tourism businesses are eligible.

Business Retention Service: For businesses facing a period of difficult change, this service locates a consultant to assist. Maximum benefits are \$5,000 for consulting services and \$30,000 for feasibility studies. For a feasibility study, the applicant must contribute 25% of the study’s cost. Consultant fees are handled as an interest-free loan, repayable in up to two years.

Capital Access Program: This program helps lenders make more loans to small businesses. Most for-profit and non-profit businesses in the retail, manufacturing and service industries are eligible. If the lender includes a particular loan in the program, then OECDD will provide funds to the lender’s loan loss reserves.

Credit Enhancement Fund: This program involves loan insurance, provided by the Fund to lenders, which enables lenders to make loans they otherwise wouldn’t make. For manufacturing, processing, and certain other firms with fewer than 200 employees, and for firms operating in economically distressed areas. Application is initially made to the lender, not to OECDD.

Entrepreneurial Development Loan Fund: This program makes initial loans of up to \$25,000 and follow-on loans of up to \$15,000. Eligibility is limited to applicants meeting two of the following criteria: in operation less than 24 months; revenues of less than \$100,000 in prior 12 months; owned by a severely disabled person.

Energy Loan Program: Administered by the Oregon Department of Energy, this program is targeted to energy conservation and renewable energy resource development. Loans can be made to individuals, businesses, local/state/federal agencies, tribes, cooperatives, and non-profits. Loans range from \$20,000 to \$20 million; terms usually range from 5 to 15 years; rates vary, currently in the 6%-7% range. For very large renewable energy projects, tax-exempt rates may be available. Eligible projects include those that save energy, produce energy from renewable resources, use recycled materials to create products, or use alternative fuels. Note: projects may also be eligible for Business Energy Tax Credits.

Renewable Energy Feasibility (REF) Fund

The intent of the fund is to assist in determining the technical and economic viability of a municipally-owned development project that uses renewable energy resources to generate electricity, heat and/or to manufacture a fuel. Proposed development projects must rely on commercially viable technologies with a demonstrated maturity in the marketplace, and be highly likely to lead to construction. Pilot demonstration and/or R&D projects are not eligible for funding.

The proposed development project must clearly demonstrate a benefit to the local community and must be a municipally-owned facility.

The following municipalities are eligible to apply for REF Fund assistance:

- Cities
- Counties
- County service districts (organized under ORS Chapter 451)
- Tribal Councils of Indian tribes
- Ports
- Districts (as defined in ORS 198.010)
- Airport districts (per ORS 838)

Ineligible entities include, but are not limited to, individuals, private businesses and non-profit organizations, schools and universities, and public agencies.

REF Fund awards may be a loan or a grant. Limited grant funds are available on a competitive basis. A “Call for Project Proposals” may be issued once or twice a year based on the availability of planning grant funds within the Special Public Works Fund (SPWF).

For additional application information contact:

Jim Zelenka, Special Public Works Fund Program Coordinator
503-986-0136
jim.zelenka@state.or.us

Oregon State-Level Tax Incentives for Businesses

Business Energy Tax Credits (BETC)

The Business Energy Tax Credit (BETC) is a powerful tool in Oregon. The BETC relates to projects involving energy conservation/efficiency, recycling, renewable energy, and alternative fuels. The credit varies with project type.

- For renewable energy projects the basic credit has been increased to 50%, calculated on the difference in cost between standard practice and actual cost. For home builders, the credit is based on the types of energy efficiency systems installed and has a dollar maximum per home. For vehicles, a variety of formulae exist.
- For all other projects, the credit is 35%. Eligible projects include office buildings, stores, apartment buildings, manufacturing plants, farms or transportation. The credit is claimed over 5 years (for most but all projects); with certain rights to carry forward any currently unusable credits.

The Oregon Department of Energy maintains a very extensive website (see <http://egov.oregon.gov/ENERGY/CONS/BUS/BETC.shtml>). Contact information is at the bottom of each application form.

Note: application must be made before a project is started. For project owners that are a public entity or non-profit organization with no tax liability (as well as a business with tax liability that chooses not to claim the credit on its own tax return), an option is available to “pass-through” the credit to a tax-paying entity, in return for a cash payment. In essence, the credit is sold (at a slight discount to its face value) to a business that has a tax liability sufficient to effectively utilize the credit.

BETC for Homebuilders: \$3,000 for building shells/mechanicals and up to \$9,000 for renewable energy systems. For both credit categories, if the builder claims a BETC tax credit, then the homeowner cannot receive a RETC credit.

High Performance Homes (HPH): \$12,000 maximum per home. A new home that meets the HPH standard is eligible for a tax credit of \$3,000 for the building shell and mechanical

systems, plus up to \$9,000 for the renewable energy system(s). The credit may be taken in one year.

Homebuilder Installed Renewable Energy Facilities: Up to \$9,000 per home. Credit calculation varies, based on system(s) installed. Photovoltaic (\$3/watt installed capacity); Solar Domestic Water Heating (\$0.60/kWh saved as determined Energy Dept. table); Active Solar Space Heating (\$0.60/kWh saved based on a Energy Dept. calculation procedure); Passive Solar (\$600/home plus \$0.60/sq.ft.); Other (e.g., wind turbines, fuel cells) Energy Dept. formula.

BETC for Renewable Energy Projects (50% credit):

High Efficiency Combined Heat and Power Projects. For facilities designed to generate electrical power and thermal energy from a single fuel source with a fuel-chargeable-to-heat rate yielding annual average energy savings of 20 percent.

Renewable Energy Resource Equipment Manufacturing Facilities. New in 2007, this credit equals 50% of the construction costs of a facility which will manufacture renewable energy systems, and includes the costs of the building, excavation, machinery and equipment. The credit can also be applied to the costs of improving an existing facility which will be used to manufacture renewable energy systems.

Renewable Energy Resource Generation Projects. Projects that use solar, wind, hydro, geothermal or biomass to produce energy, displace energy, or reclaim energy from waste may qualify. Projects must replace at least 10 percent of the electricity, gas, or oil used.

Solar Photovoltaic (PV) Projects. Maximum cost eligible for this credit will be reduced over time, as state milestones are reached. An application fee must be paid.

Solar Thermal Projects. Maximum cost eligible for this credit will be reduced over time, as state milestones are reached. An application fee must be paid.

BETC for Energy Efficiency Projects (35% credit):

Conservation Projects. Retrofit and construction projects are eligible. Credit is based on the extra costs needed to make project exceed code. Need to demonstrate 10% better efficiency.

Horizontal-Axis Washer Projects. Credit for front-load washers based on eligible project costs.

Lighting. Projects must be 25% more efficient for retrofit projects and 10% for new construction.

BETC for Rental Properties (35% credit):

Appliances for Rental Dwellings. Premium efficiency clothes washers, refrigerators, dishwashers, water heaters, furnaces, boilers and air handlers that are pre-certified for the Residential Energy Tax Credit are eligible.

Rental Dwelling Weatherization. Various projects qualify: thermal replacement windows or doors; attic, floor, and wall insulation; pipe and duct insulation; caulking and weather-stripping. Need to demonstrate a minimum 10% energy savings.

BETC for Transportation Projects (Credit % or \$ amount varies):

Alternative Fuel Infrastructure Projects. The tax credit for most Alternative Fuel Infrastructure Projects is 50% of eligible project costs; however, some projects (e.g. propane, compressed natural gas, liquefied natural gas) may qualify for a tax credit of 35%.

Alternative Fuel Vehicles. The tax credit for Alternative Fuel Vehicle Projects is 35% of eligible project costs.

Efficient Truck Technology. The tax credit for Efficient Truck Technology Projects is 35% of eligible project costs.

Hybrid Vehicles. The tax credit for hybrid-electric vehicles is 35% of eligible project costs and is taken in one year. See application instructions for current list of eligible vehicle models. (This is likely to be phased out, and electric and plug-in credit phased in.)

Transportation. A wide variety of eligible project categories, including carpool, vanpool, and bicycle programs exist.

BETC for Other Project Categories (35% credit):

Fuel Cell Projects. Business owners and others who invest in fuel cell projects in Oregon may be eligible.

Recycling Projects. Projects that recycle materials not required by law or that develop new markets for recycled materials are eligible. New or replacement equipment for sorting or hauling materials where the recycling is required by law is not eligible. Other examples of ineligible projects are recycling of chlorofluorocarbons and used motor oil.

Sustainable Buildings. To be eligible, buildings must meet Leadership in Energy and Environmental Design (LEED), or equivalent, standards. Unlike tax credits based on cost (usually, the increased cost over some industry standard), this credit is based on the building's square footage.

Other Tax Incentives

Investment Advantage Program: See description in “Local-Level Financial Incentives” section of this chapter.

Pollution Control Tax Credits: Administered by the Oregon State Department of Environmental Quality, there are currently two programs- Truck Engine tax credits and Engine Repower and Retrofit tax credits. The former encourages the purchase of the newest generation of cleaner-burning engines. The latter is new, and DEQ has not yet issued administrative rules.

Qualified Research Activities Tax Credit: Likely to be of interest only to larger firms engaged in energy efficiency or renewable energy, this credit is for increases in payments made to qualified organizations for research conducted in Oregon. Environmental technology is one of the six specified fields of research. “Qualified organizations” (i.e., the recipients of the research payments made by the taxpayer) include educational institutions and scientific research organizations. Contact the Oregon Department of Revenue in Salem.

Residential Energy Tax Credits (RETC): Many businesses involved in energy efficiency and renewable energy sell equipment and/or services to individual homeowners. Therefore, even though this guide deals primarily with financial incentives available to businesses, it is important that businesses understand the tax incentives available to their customers. Tax credits are available to individual taxpayers under the state's Residential Energy Tax Credit (RETC) program. The maximum credit available depends on the qualifying equipment involved. As with BETC, separate application forms are required for each category of equipment:

- Appliances (clothes washers, dishwashers, refrigerators)
- Fuel Cells
- Heating and Air Conditioning Systems
- Solar (water heating, space heating, photovoltaic electric systems)
- Water Heaters
- Wind Electric
- Wood and Pellet Stoves
- Vehicles (Hybrid and Alternative Fuels)

As with the Business Energy Tax Credit programs, a pass-through option is available.

Small City Taxable Income Exemption for Business Development: See description in the "Local-Level Financial Incentives" section of this chapter.

Strategic Investment Program: See description listed under the "Local-Level Financial Incentives" section of this chapter.

U.S. Federal-Level Financial Incentives

Federal assistance is available in the following forms: grants, loans (typically, loan guarantees), and tax incentives (in the form of tax credits or special tax deductions). The federal government also buys goods and services through procurement contracts.

Newly-elected President Barack Obama has pledged to strategically invest \$150 billion over the next 10 years to accelerate the commercialization of plug-in hybrids, promote development of commercial scale renewable energy, encourage energy efficiency, invest in low emission coal plants, advance the next generation of biofuels and fuel infrastructure, and begin transition to a new digital electricity grid.

In the renewable energy and energy efficiency fields, the federal departments or agencies most frequently involved include: the Small Business Administration (SBA), the Department of Energy (DOE) and the Department of Agriculture (USDA). The federal government also makes funds available to state governments; see the "Oregon State-Level Financial Incentives" section of this chapter for further information.

Federal Loan Programs

Small Business Administration (SBA): In Oregon, the SBA maintains an office in Portland (see <http://www.sba.gov>).

The SBA offers loan programs and counseling to assist small businesses. However, the SBA is primarily a guarantor of loans made by private and other institutions and does not make direct loans to small businesses. Currently, 7(a) loans are the most basic and most used type of loan. Also

offered are a CDC/504 program (for community development projects), a micro-loan (up to \$35,000) program and a surety bond program for contractors.

Clean Renewable Energy Bonds (CREB): An unusual type of bond, CREBs are available only to Local Government, State Government, Tribal Government, Municipal Utility, or Rural Electric Cooperative entities for financing solar thermal electric, photovoltaic, landfill gas, wind, biomass, hydroelectric, geothermal electric, municipal solid waste, and small-scale irrigation power projects. Advance authorization needs to be obtained from the IRS. The tax benefit related to CREBs accrues to the bond holder, not the bond issuer.

USDA Renewable Energy Systems and Energy Efficiency Improvements Program:

Through this program, USDA offers loans and/or grants to agricultural producers and rural small businesses to purchase renewable energy systems and make energy efficiency improvements. In 2008, the USDA accepted \$220 million in applications for grants, loan guarantees, and loan/grant combination packages. Solar water heat, solar space heat, photovoltaic systems, wind, biomass, geothermal electric, geothermal heat pumps, anaerobic digestion, renewable fuels, and fuel cells using renewable fuels are eligible. The USDA also has a Rural Economic Development Loan and Grant Program, but it is much smaller in available funding than the renewable energy program described above. (See Appendix E for a list of Oregon USDA regions and contact information.)

Rural Energy for America Program (REAP): The REAP program was enacted by the 2008 Farm Bill. It is a revised, updated, and renamed version of USDA's "§9006" program. Regulations are now being developed, but REAP is expected to retain many of the features of the old §9006 program but with increased funding. REAP offers grants and/or loan guarantees for the purchase and installation of renewable energy generating systems and for energy efficiency improvements. Assistance is limited to small businesses, and farmers and ranchers. Projects must be located in a rural area. REAP grants and guarantees may be used individually or in combination. Together they may finance up to 75% of a project's cost. Grants can finance up to 25% of project cost, not to exceed \$500,000 for renewable projects, or \$250,000 for efficiency projects.

Federal Grants

Federal agencies list upcoming grants at <http://www.grants.gov>. Anyone can search the database, but applying for a grant requires registration.

The agencies most frequently involved in renewable or sustainable energy grants include:

- Department of Commerce
- Department of Interior
- Environmental Protection Agency
- General Services Administration
- National Science Foundation
- Small Business Administration
- U.S. Department of Transportation
- U.S. Department of Energy
- United States Department of Agriculture

Many grants are location specific; e.g., Oregon is in EPA Region 10. Also, the time between postings and required proposal submission is often quite short, so searches should be conducted frequently.

For example, the Department of Energy lists current grants for which the closing date hasn't been reached. This page also has links to the Energy Department's "Small Business Innovation Research Program." Be aware, however, that the Energy Department's grants usually have high research components, and may be of interest only to universities and businesses with a research department.

Economic Development Administration (EDA)

The Economic Development Administration funds projects, through its Technical Assistance and Economic Development grant programs, which demonstrate job creation or job retention. It does not have programs specific to renewable energy; however, the EDA has typically looked favorably on renewable energy projects that fit its criteria. For more information on their grants, and to view their announcement on projected funding through the American Recovery Program, visit their website at <http://www.eda.gov>.

Contact:

David Porter, Economic Development Representative for State of Oregon
121 SW Salmon Street, #244
Portland, OR 97204
503.326.3078
dporter@eda.doc.gov

Selling to the Federal Government

The relevant website is <http://www.fbo.gov>. Searching the database for current opportunities does not require registration, but making a bid does. See the Central Contractor Registration (CCR) link under "Additional Resources" to register. A useful way to get educated about this complicated website is by clicking on the "General Information" tab at the top of the home page. In particular, knowing the Product Classification Codes is useful. The FAQ page is also informative. To review opportunities, click the "Opportunities" tab. For all opportunities, click the "Opportunities List" tab. Be aware, however, that an unfiltered list returns more than 60,000 listings, including awards made years ago. Instead, limit the results by clicking on the "Posted Date" tab and reviewing only the more recent results. Keywords can also be used to narrow the search. This is where familiarity with the product classification codes is important. As an alternative to the "Opportunities List" tab, an "Advanced Search" tab also exists. Unfortunately, the sub-element categories are not self-explanatory, so you may need to contact the site's "Help Desk" for assistance; the link is at the bottom left of every page.

Note: As with applying for federal grants, selling to the federal government requires diligence. A front-end commitment of time needs to be made to "learn the system" and checking for new postings needs to be done on a routine basis.

Federal Tax Incentives

Most of the federal tax laws relating to permitted expense deductions apply to all businesses, not just those engaged in clean energy (for example, wage, interest, and depreciation expense deductions). Some deductions are energy-specific, and these are described herein.

On October 3, 2008 the United States enacted H.R. 1424, which includes the Energy Improvement and Extension Act of 2008, extending many of the Energy Efficiency Tax Incentives first enacted in 2005 but which expired at the end of 2007, or that were scheduled to expire at the end of 2008. The Act contains the much-anticipated extension of the production tax credit (PTC) and investment tax credit (ITC) sunset dates.

The Act extends the PTC sunset date for certain wind and refined coal facilities until December 31, 2009, and extends the PTC sunset date for certain other qualifying facilities until December 31, 2010. The Act also expands the PTC to include certain marine and hydrokinetic renewable energy facilities placed in service on or before December 31, 2011.

The Act extends the ITC placed-in-service sunset date for solar, fuel cell and microturbine property until December 31, 2016 and expands the ITC to include combined heat and power system property, qualified small wind energy property, and geothermal heat pump system property.

In addition, H.R. 1424 contains a variety of other renewable energy tax provisions, including provisions allowing the energy credit to offset alternative minimum tax liability; increasing the amount of the biodiesel and renewable diesel fuel credits and extending the sunset dates until December 31, 2009; authorizing new clean renewable energy bonds and qualified energy conservation bonds; and extending the energy efficient commercial buildings deduction and the new energy efficient home credit.

The bill also includes extensions of a variety of renewable energy tax incentives. The energy efficiency provisions include:

- An extension of the commercial buildings tax deduction to the end of 2013.
- An extension of the tax credit for efficient furnaces, boilers, air conditioners, water heaters and insulation and window upgrades to existing homes (covering improvements installed in 2009, but not 2008).
- A one-year extension of the new energy-efficient home tax credit, to the end of 2009.
- Three-years of manufacturer tax credits for sales of high-efficiency refrigerators, clothes washers, dishwashers, and dehumidifiers (2008-2010).
- A new tax credit for plug-in hybrid vehicles purchased starting in 2008 and extending until shortly after the number of qualifying vehicles reaches 250,000.
- A new 10% investment tax credit for combined heat and power systems (through 2016).
- An extension of fuel cell and microturbine credits to the end of 2016.
- Accelerated depreciation for smart meters and smart grid systems.
- Extension of an existing bonding program for green buildings and sustainable design, and establishment of a new energy conservation bond program that would help local and state governments to fund energy conservation efforts.

The American Recovery and Reinvestment Act, passed in early 2009, includes numerous energy-related tax credit and funding sources. (See ARRA section beginning on the following page.)

Note: As with Oregon-level tax incentives, federal tax incentives come at a cost- the requirements to qualify for a credit are almost always quite detailed. In addition to the websites referenced below, search <http://www.irs.gov> for specific rules, regulations, and application forms.

Energy-Specific Federal Tax Deductions:

For **energy efficient commercial buildings**, provided certain energy savings are attained above established base levels, deductions (tied to \$/sq.ft.) are available for the whole building; or for lighting, HVAC, or building envelope; or for lighting only. For whole buildings, the deduction is \$1.80/sqft. For lighting, HVAC, or building envelopes, the deduction is \$.60/sqft. For lower energy savings levels, a deduction of \$.30/sqft is available for lighting systems. (See “Commercial Buildings” at http://aceee.org/press/Tax_incentive05.pdf)

In February 2008, a 50% “**bonus depreciation**” was added to the MACRS depreciation rules for a **wide variety of renewable energy systems** placed in service in 2008.

Energy-Specific Federal Tax Exclusions:

Firms that receive energy-related rebates from public utilities for the purchase or installation of any energy conservation measure for residential buildings may be able to exclude such rebate from their federal taxable income. However, this is not an established practice.

Energy-Specific Federal Tax Credits:

A **biodiesel fuels credit** encourages the production and use of biodiesel fuels. Entities using unblended biodiesel (B100) as an on-road fuel may qualify for a credit of \$1.00/ gallon for agri-biodiesel (e.g. biodiesel made from soybean oil) or \$0.50/gallon if made from other sources (e.g. waste grease). Certain sellers of biodiesel are also eligible.

A tax credit is available to **builders of new energy-efficient homes**. Provided certain energy savings are achieved, the credit is \$2,000 for site-built and manufactured homes with the highest savings, and \$1,000 for manufactured homes meeting less rigorous targets. The credit is claimed by the homebuilder, not the home buyer.

An **electricity production tax credit** is available for certain renewable projects, including landfill gas, wind, biomass, hydroelectric, geothermal electric, municipal solid waste, refined coal, Indian coal, and small-scale hydroelectric. The credit amounts to 2.0¢/kWh for wind, geothermal, closed-loop biomass; 1.0¢/kWh for other eligible technologies. It applies to the first ten years of operation.

Tax credits are still available (to individuals as well as businesses) for certain **hybrid passenger and heavy-duty vehicles**. The amount of the credit is based on the total number of units sold by the vehicle’s manufacturer. Once sales reach 60,000 units, the credit level starts reducing, and eventually is no longer available. In addition to hybrid passenger cars, SUVs and trucks, the credit also applies to vehicles powered by fuel cells, advanced “lean burn” diesel and other alternative power sources.

For **small agri-biodiesel producers** and for **small ethanol producers**, tax credits of \$0.10/gallon are available. A small agri-biodiesel producer is one that produces up to 60 million gallons of agri-biodiesel/year, but the credit is only available on the first 15 million gallons of agri-biodiesel produced. The same criteria are applied to small ethanol producers.

American Recovery and Reinvestment Act

3EStrategies delayed finalizing this inventory until we were able to include an overview of the amount and types of funds and incentives that would come to Oregon for clean energy-related projects through the American Recovery and Revitalization Act (ARRA). This information is given below.

Federal ARRA website: www.recovery.gov

Oregon ARRA website: <http://recovery.oregon.gov/>

Note: The ARRA information is evolving rapidly. The information below provides the details known as of April 1st, 2009 – some specific details were not yet given by the federal government at that time.

Transportation

The ARRA provides the following funds for transportation related projects in Oregon:

Roads and Bridges:

Oregon will receive about 1.16% of the \$29 billion, which is about \$334 million; 30% of the highway program funds will go to cities and counties for a total of \$100 million, leaving approximately \$224 million for state projects around the state.

Contact: Travis Brouwer, Oregon Department of Transportation

Email: travis.brouwer@state.or.us

Phone: 503-986-3448

http://www.oregon.gov/ODOT/HWY/economic_stimulus.shtml

Multi-modal Transportation:

More than \$9 billion was provided for passenger rail, including \$8 billion that is available for grants to states for high-speed passenger rail corridors. Oregon Department of Transportation (ODOT) partners with the Washington State DOT and Amtrak to operate the Cascades Amtrak service on the Northwest high-speed rail corridor, which runs from Eugene through Portland and Seattle on to Vancouver, British Columbia and is one of the nation's top passenger rail corridors in terms of ridership. ODOT will seek a federal investment from the stimulus program to improve the speed and reliability of passenger rail service on the corridor and build capacity to allow for the eventual addition of a third daily roundtrip train between Eugene and Portland. ODOT will work with partners to develop proposals for funding for discretionary grants distributed by U.S. DOT for port, rail, transit, and highway projects.

Contact: Kelly Taylor, Oregon Department of Transportation

Email: kelly.c.taylor@state.or.us

Phone: 503-986-4125

Public Transit:

Oregon's urban transit districts in Portland, Eugene/Springfield, Salem/Keizer, Medford, Longview, Corvallis, and Bend will receive about \$65.9 million in formula funds for capital needs such as bus purchases, facilities, and bus shelters. Tri-Met will also receive about \$1.1 million under the fixed guideway modernization program for work on the MAX system. ODOT's Public Transit Division administers funding for non-urbanized areas and will distribute about \$14.6 million to rural transit projects.

Contact: Michael Ward, Oregon Department of Transportation

Email: michael.r.ward@state.or.us 9

Phone: 503-986-3413

Energy Efficiency – Renewable Energy

The following funds for energy efficiency and renewable energy projects will be available in Oregon.

Weatherization Assistance Programs:

Oregon will receive \$39.3 million to help low-income families reduce their energy costs by weatherizing their homes. Funds are provided based on an on-site energy audit and cost-effective guidelines. The expanded program includes households at or below 200% of federal poverty guidelines. The maximum allowance per household has been increased from \$2,500 to \$6,500.

Contact: John Fletcher, Oregon Housing and Community Services

Phone: 503-986-6700

State Energy Grant Program:

Oregon will receive \$42 million for energy efficiency and conservation projects. The Oregon Department of Energy is awaiting guidelines from the U.S. Department of Energy on project eligibility.

Contact: Diana Enright or Betty Merrill

Phone: 503-378-4040

<http://egov.oregon.gov/ENERGY/ODOE> (Individuals can sign up to receive email updates at this Web address.)

Energy Efficiency and Conservation Block Grant Program:

Oregon will receive \$34.9 million for the block grant program. The ARRA legislation requires that 68% of these dollars go directly to Oregon's ten largest cities and counties, 28% to smaller cities and counties, 2% for tribes, and 2% to be competitively awarded.

Contact: Diana Enright or Betty Merrill

Phone: 503-378-4040

<http://egov.oregon.gov/ENERGY/ODOE>

Energy Saving Tax Incentives for Homeowners:

Oregon homeowners will have access to incentives to make their homes more energy efficient. The bill continues and expands federal tax credits for purchases of new furnaces, energy-efficient windows and doors, or insulation. The bill also provides a tax credit of up to \$7,500 for families that purchase plug-in hybrid vehicles to promote the move to zero-emission vehicles.

Modernization of the Power Grid:

The Bonneville Power Administration received \$246 million to modernize the electricity power grid serving Oregon. This work will not only create jobs, but it will also make the power grid more energy efficient and reliable. Businesses interested in learning more about the grid modernization efforts should contact the U.S. Department of Energy directly.

Federal contact: U.S. Department of Energy

<http://www.energy.gov/recovery/index.htm>

Workforce Training Funds

In addition to the funds available directly for energy efficiency, renewable energy and transportation projects, ARRA provides a number of funding opportunities for green jobs training programs. These include:

- **Workforce Investment Act** training & employment services: \$36.3 million in Oregon. *Provides funding for job training, including state grants for adults, youth and dislocated workers. Additional money is available for community service employment for low-income seniors.*
- **Green Jobs Act** (discretionary grants): \$500M (total US)
- 6% of **highway funding** states receive may be used for workforce training
- **Smart Grid Program**: \$100 million for training (total US)
- **Summer Youth Program**: Amount unknown at time of publishing.

Additional Federal Level ARRA Funds and Incentive Programs**Energy Saving Tax Incentives and Grants for Businesses:**

The bill includes a three-year extension of the popular federal production tax credit (PTC) for electricity derived from wind (through 2012) and for electricity derived from biomass, geothermal, hydropower, landfill gas, waste-to-energy, and marine facilities (through 2013). Many renewable energy companies in Oregon use this tax credit to build renewable energy production facilities.

The Senate Provision (Sec. 1102)

As a temporary alternative to the PTC, facilities that are placed in service in by 2012 (for wind) and 2013 (for other renewable technologies) will be allowed to choose a 30% investment tax credit (ITC) in place of the production credit.

There also is a new federal manufacturing tax credit for investment in advanced energy facilities, such as facilities that manufacture components for the production of renewable energy, advanced battery technology, and other innovative next-generation green technologies.

Federal contact: U.S. Department of Energy
<http://www.energy.gov/recovery/index.htm>

State and Local Bonds Program

ARRA authorizes \$2.4 billion of Energy Conservation Bonds (ECBs) to finance state, municipal and tribal government programs, greenhouse gas reduction initiatives, and loans and grants to implement green community programs.

State and local governments can issue the bonds for a broad range of purposes that include capital expenditures to reduce energy use in publicly-owned buildings by at least 20%; implementing green community programs; rural development involving electricity production from renewables; research facilities and grants for the development of cellulosic ethanol or other non-fossil fuels; technologies to capture and sequester carbon dioxide produced by fossil fuel use; increasing the efficiency of technologies for producing non-fossil fuels; automobile battery technologies and other technologies to reduce fossil fuel use in transportation, or technologies to reduce energy use in buildings; mass commuting facilities that reduce energy use (including pollution reduction for vehicles used for mass commuting); demonstration projects that promote commercialization of green building technology; conversion of agricultural waste for fuel production; advanced battery manufacturing technologies; technologies to reduce peak electricity demand; technologies that capture and sequester carbon dioxide emitted from fossil fuel-fired power facilities; and public education campaigns to promote energy efficiency.

Additional Credits

ARRA increases the credit for home energy improvements such as fans, furnaces, boilers and shell improvements to 30% of incremental cost and removes caps on those credits through the end of 2010.

ARRA increases the tax credit for the installation of retail and residential alternative refueling systems. Credit is 50% for ethanol, natural gas and liquefied petroleum gas, but 30% for hydrogen. Credit caps are \$50,000 for retail systems and \$2,000 for residential. For hydrogen, the credit limit is raised to \$200,000.

ARRA established a tax credit for the purchase of new plug-in vehicles (plug-in hybrids and pure electric vehicles). The credit is based on the battery capacity of the vehicle, and is capped at \$7,500 for light-duty vehicles and up to \$15,000 for the heaviest vehicles. When total U.S. sales of vehicles eligible for the credit reaches 200,000 per manufacturer, the credit begins to phase out.

ARRA establishes a credit of up to \$2,500 for low-speed four-wheeled vehicles, as well as two- and three-wheeled electric vehicles. It also establishes a credit of up to \$4,000 for the conversion of an existing vehicle to battery power. ARRA also allows taxpayers otherwise subject to the Alternative Minimum Tax (AMT) to claim plug-in credit (as well as other alternative fuel and advanced vehicle credits).

III. Employment and Training Resources

Oregon's Clean Energy Workforce Training Programs

During the course of this study we collected information from six Oregon academic institutions, one non-profit organization and twelve apprenticeship programs (eleven provided by union training centers) that are providing a total of twenty-eight clean energy workforce training programs. These are listed below.

Academic and Non-Profit Programs

Central Oregon Community College (COCC); Bend, OR

Program	Degree / Certificate	Training Application(s)
Sustainable Building Advisor Program	Sustainable Building Advisor Certificate	Green Building, Building Science, Construction

Description: Sustainable Building Advisor Program

This nine-month course is specifically designed for working professionals wishing to apply sustainable concepts to the buildings they design, develop, and construct. The course explores how to construct buildings that are energy and resource efficient, healthy working and living environments, environmentally responsible and cost effective.

Designed for architects, engineers, home designers, tenant and developer representatives, construction and capital project managers, building operators and other building industry professionals, information is presented in a highly interactive manner delivered by expert instructors and includes small group projects and field trips to see sustainable building concepts implemented.

Central Oregon Community College (COCC); Future Planned Courses

COCC will be offering a two-day PV for Electricians course and a three-day Intro to Home Energy Auditing course in May 2009. Fall 2009 plans include:

- A five-day (plus field sessions) course to prepare students for national certification by the Building Performance Institute (BPI) as a Home Energy Analyst;
- A course preparing students for the NABCEP PV Entry Level of Knowledge certification exam (for those with little or no PV knowledge);
- A course providing an overview of renewable energy technologies and their job outlooks.

Columbia Gorge Community College (CGCC);The Dalles, OR

Program	Degree / Certificate	Training Application(s)
Renewable Energy Technology (RET)	1-year certificate: Renewable Energy Technology	Hydro-generation, wind-generation, & automated manufacturing
Renewable Energy Technology (RET)	2-year AAS: Renewable Energy Technology	Hydro-generation, wind-generation, & automated manufacturing

Description: Renewable Energy Technology Program

Columbia Gorge Community College's Renewable Energy Technology program is a career ladder program offering a one-year Certificate and an Associate of Applied Science degree. This program

was designed in collaboration with industry partners from the wind energy industry, power generation industry, Bonneville Power Administration, The Insitu Group, Intel, Cardinal IG, and Black and Veatch.

The Renewable Energy Technology Program prepares students for employment in a broad range of industries. These include hydro-generation, wind-generation, automated manufacturing, and engineering technicians.

The one-year certificate provides a basic level of knowledge and skills in the above areas in addition to computer applications, math, and writing skills. The two-year degree includes more in-depth skill levels to include PLCs (programmable logic controllers), industrial control systems, semiconductor devices/circuits, and higher levels of math and physics.

Entry level wages range from \$13 per hour to \$15 per hour. More experienced technicians, or those who progress more quickly on the career ladder due to having graduated from the program, can expect wages ranging from \$26 to \$36 per hour, with electrical, electronics, and communication engineering technicians having the potential to earn far more.

Lane Community College (LCC); Eugene, OR

Program	Degree / Certificate	Training Application(s)
Energy management technician	2 year AAS	Facility Managers, Energy Auditors, Energy Program Coordinators
Renewable energy technician	2 year AAS	Designing and installing solar electric and domestic hot water systems

Description:

Students gain a working understanding of energy systems in today's built environment and the tools to analyze and quantify energy efficiency efforts. The program began with an emphasis in residential energy efficiency / solar energy systems and has evolved to include commercial energy efficiency and renewable energy system installation technology.

Energy Management Technician

Students learn to apply basic principles of physics and analysis techniques to the description and measurement of energy in today's building systems with the goal of evaluating and recommending alternative energy solutions that will result in greater energy efficiency and energy cost savings. Graduates find employment in a wide variety of disciplines and may work as Facility Managers, Energy Auditors, Energy Program Coordinators or Control System Specialists, for such diverse employers as engineering firms, public and private utilities, energy equipment companies, and departments of energy.

Renewable Energy Technician

This professional technical program is offered as a second-year option within the Energy Management Program. The coursework prepares students for employment designing and installing solar electric and domestic hot water systems. An advisory committee made up of renewable energy practitioners guides program development.

Renewable Energy students, along with Energy Management students, take a first-year curriculum in commercial energy efficiency giving them a solid background that includes residential energy efficiency, HVAC systems, lighting, and the usual requirement of physics and math.

In the second year, renewable students diverge from the Energy Management curriculum and take coursework that starts with two courses in electricity fundamentals and one course in energy economics. In the following terms students learn to design, install, and develop a thorough understanding of photovoltaic (PV) and domestic hot water (DHW) systems.

Training is founded on installation of DHW and PV systems, however students acquire skills useful for a broader job market. They will often work for installation contractors, but they will have the background to seek employment in national and international marketing and sales, materials estimating, sizing and design.

Lane Community College (LCC): Northwest Energy Education Institute (NWEEL); Eugene, OR

Program	Degree / Certificate	Training Application(s)
NWEEL certification course	Energy Management Certification (EMC)	Advanced energy management principles and techniques
NWEEL certification course	BPA Residential Energy Auditor Certification	Residential energy audits
NWEEL certification course	BPA Residential Inspector Certification	Weatherization and residential energy conservation
NWEEL certification course	Building Operator Certification (BOC)	Energy and resource-efficient building operations

Description: *Energy Management Certification*

This is an advanced certification program designed to provide a broad base of skills for energy managers and measurable return-on-investment for employers. This program is designed for engineers, technicians, architects, facility, maintenance and energy managers.

This program teaches a broad spectrum of energy management principles and techniques. Topics include building energy use, glazing, insulation, building envelope, heating/cooling, secondary HVAC, controls, central plant equipment, energy auditing, operation and maintenance.

Description: *Building Operator Certification*

This is a professional development program created by The Northwest Energy Efficiency Council (NEEC), and delivered in Oregon by NEEI. It is designed for operations and maintenance staff working in public or private commercial buildings. It certifies individuals in energy and resource-efficient operation of building systems at two levels:

- To become Level I certified, participants must attend seven Level I classes (56 hours), and complete class exams and project assignments.
- To become Level II certified, participants must attend four core classes (35 hours) and two elective classes (14 hours), complete class exams, and assigned projects.

Bonneville Power Administration Residential Certification. Two BPA certification programs are offered for those interested in residential energy and inspector certification.

Description: Residential Energy Auditor Certification

A five-day course that includes training in the principles of energy auditing, and interaction with utility customers in the field. This comprehensive program includes training in the principles of energy, energy and the building shell, energy auditing, air leakage, insulation, windows and doors, heating systems, indoor air quality, lighting and appliances, cooling and water heating. Attendees will be trained to conduct certified energy audits and deal with utility customers in the field. A certification examination will be administered on the last day of the session.

BPA Residential Energy Auditor Certification is ideal for employees who will be involved in a residential weatherization program and working with residential customers, helping them determine how energy is being used in their homes, what measures can be taken to save energy, how much those measure will cost and how quickly the measures will pay for themselves.

Description: Residential Inspector Certification

A three-day workshop that teaches attendees how to conduct home inspections after residential weatherization work has been done. This workshop is a comprehensive review of installation specifications for residential weatherization work, as well as strategies for dealing with contractors and homeowners to ensure high-quality installation and a satisfied homeowner.

BPA Residential Inspector Certification is best suited for employees who are interested in weatherization specifications and/or will be inspecting residential energy conservation work and working with weatherization contractors.

Oregon Institute of Technology (OIT); Portland, OR & Klamath Falls, OR

Program	Degree / Certificate	Training Application(s)
Renewable energy systems	BS in Renewable Energy Systems	Management design and installation of renewable energy systems

Description: Renewable Energy Systems

The OIT Bachelor degree in Renewable Energy Systems is the first of its kind in the nation. The commencement of the first graduating class took place in June 2008. The program reports significant demand for graduates and need for additional faculty and lab facilities at both the Portland and Klamath Falls campuses to meet that demand.

The degree program begins by establishing a solid foundation of physics, chemistry and mathematics, which pave the way for coursework in electrical and mechanical engineering. Upper-division courses in renewable-energy specific courses include photovoltaics, energy management and auditing, wind power, biofuels, renewable-energy transportation systems, green building and fuel cells. The Renewable Energy curriculum prepares graduates for careers in the energy sector in general, and the renewable energy in particular.

Graduates of the program will be prepared for graduate study or for immediate employment as field engineers, energy auditors, renewable energy system integrators for homes and businesses, manufacturing engineers for component and subsystem manufacturers, designers for components and subsystems, local and state government renewable-energy inspectors, planners and other positions in the energy field.

Portland Community College (PCC): Trades and Industries; Portland, OR

Program	Degree / Certificate	Training Application(s)
Facilities Maintenance	Facilities Maintenance Certificate	Facilities Maintenance

Description: Facilities Maintenance

The facilities maintenance technician installs, maintains and repairs HVAC/R (heating, venting, air conditioning and refrigeration) and other equipment and systems where environmental quality is essential to success of the company. They work in the semiconductor industry, large health care facilities and other heavy industry organizations.

This program offers the skills to enhance a career in facilities maintenance. Students learn the skills and concepts necessary to install, operate, maintain and repair control, piping and mechanical systems in large commercial, medical, institutional and industrial buildings.

Portland Community College (PCC): Future Planned Programs

Program	Degree / Certificate	Training Application(s)
Renewable energy systems (RES) Solar or Fuel Cell	AAS in Engineering Technology	Solar installation and maintenance or fuel cell development
Renewable energy systems (RES) Wind or Hydro	AAS in Engineering Technology	Hydro-generation or wind-generation

Additional Non-Academic Non-Profit Program:**Energy Star Energy Trust Technical School Outreach**

The Energy Star Energy Technical School Outreach initiative is an innovative educational opportunity provided by the non-profit Energy Trust of Oregon's *ENERGY STAR®* New Homes program. It provides schools with an opportunity to incorporate cutting edge curriculum and project-based learning experiences into existing technical programs. Themes available for incorporation into existing high school and community college technical programs include:

- Building Science / Construction
- Architectural Drafting
- Green Building
- Energy Conservation

At its core, Technical School Outreach is a student and teacher development program, offering a combination of classroom and field learning experiences. The program is structured to introduce participants to the theories and best practices for energy efficient, climate-specific residential design and construction. The initiative provides schools with an opportunity to incorporate cutting edge curriculum and project-based learning experiences into existing technical programs.

Customized educational modules are administered on-site by industry professionals and technical experts. Modules target areas such as air sealing, insulation, mechanical ventilation, heating and cooling, solar technologies and building diagnostics, as well as emerging technologies such as tankless water heaters and radiant floor heating. Students receive hands-on training in areas such as effective air sealing techniques, framing alternatives, proper installation of mechanical systems, insulation material alternatives, blower door diagnostic testing and renewable energy applications.

Apprenticeship, Unions and the Clean Energy Industry

Union apprenticeship programs are well-established, privately-funded programs of long standing. These programs respond directly to the stated needs of employers, systematically and thoroughly training workers to match the number of job openings predicted by those employers. As registered apprenticeship programs overseen by the State of Oregon, they are monitored closely, their admissions and graduation records are available for public scrutiny, and they pay special attention to the recruitment and retention of women and minorities to their programs.

Registered apprenticeship is a system that allows workers to earn while they learn – apprentices work in the industry while taking classes at night, or for a specified number of weeks out of each year. Their wage rates are tied to journey-level wages, typically starting at 50% of a full-fledged journey level rate and increasing steadily as the apprentice accumulates work and classroom hours.

Apprenticeship programs provide workers with credentials that are portable: “journeymen’s cards” are recognized throughout the industry and across state lines, providing workers who earn them the means to make a living not tied to the fortunes of a single employer. In addition, union apprenticeship training centers provide upgrade training to journey level workers. This means that older workers, trained in more traditional technologies, can easily return to their training centers for continuing education to upgrade their skills. Many of these centers have added new curricula in solar, wind, geothermal and other areas – this training is available to both apprentices and journey level workers. Thus, union workers can continue to learn and grow, and to develop new skills to match new industry demands.

Eleven union apprenticeship training centers and one non-union center responded to the survey, representing 15 occupations and operating in 29 sites around the state. Enrolling approximately 3,000 apprentices and serving several hundred journey level workers in continuing education classes, these programs graduate an average of 500 people per year.

National Electrical Contractors Association (NECA) / International Brotherhood of Electrical Workers (IBEW) Training Center

Occupation	Certification/ License	Length of Training Program	Starting Hourly Wage
Residential Electrician	Residential Electrical license	2 years	\$18
Inside Electrician	Electrical license	5 years	\$33

Central Electrical Training Center

Occupation	Certification/ License	Length of Training Program	Starting Hourly Wage
Limited Residential Electrician	Residential Electrical license	2 years	\$23
Inside Electrician	Electrical license	5 years	\$31

Northwest Line Construction Industry Joint Apprenticeship Training Committee (JATC)

Occupation	Certification/ License	Length of Training Program	Starting Hourly Wage
Lineman	Electrical license	3 years	\$34

Description NECA/ IBEW:

There are 16 electrical apprenticeship programs in Oregon which vary greatly in size and composition. They train residential and commercial electricians as well as outside linemen who work primarily for utilities.

Three of these program responded to the survey. These programs have been operating 40-50 years as a cooperative endeavor of the IBEW and the NECA. In response to the growing solar industry, these programs, in cooperation with the national NECA/IBEW training organization, have developed a new, state-of-the-art curriculum in solar photovoltaic technology. Covering wind and fuel cells as well as solar, this curriculum is currently being used to upgrade the skills of existing electricians as well as apprentices.

The major occupation for which these programs train is Inside Electrician. This apprenticeship leads to the General Journeyman Electrician license. Inside Electricians perform electrical installations, including solar; construction, including “green building” work; and maintenance, repair and service of solar, wind, wave and other energy equipment.

The other major occupational category covered by electrical apprenticeship programs is Residential Electrician. Residential Electricians work in all phases of the residential electrical construction and service industry. They do the electrical construction work on projects ranging from single-family residences to apartment complexes of no more than three stories, including solar installation. They also perform repair and maintenance on existing installations.

The Lineman’s program (which is registered with Washington State, but not Oregon) trains apprentices to construct and maintain high-voltage electrical transmission facilities from the generation site (including renewable energy sites) to the utility customer. This is a three-year program which graduates about 75 workers each year; the occupation has a \$34 starting wage.

Plumbers & Steamfitters Local 290 Training Center

Occupation	Certification/ License	Length of Training Program	Starting Hourly Wage
Steamfitter	Boiler license	5 years	\$35
Plumber	Plumbing license	5 years	\$35

- Steamfitter: Works with steam and hydronic heating systems.
- Plumber: Solar water heating; gray water reclamation; related geothermal applications.

Willamette Carpenters Training Center

Occupation	Length of Training Program	Starting Hourly Wage
Carpenter	4 years	\$29
Industrial Maintenance Millwright	4 years	\$25

- Carpenter: Green building training, including insulated concrete forms, siding and thermal barriers for buildings.
- Industrial Maintenance Millwright: Turbine work, including mounting gear units, installing blades, rigging towers, maintenance.

HVAC & Metals Institute/SMW Local 16

Occupation	Length of Training Program	Starting Hourly Wage
Sheet Metal Worker	5 years	\$18

- Sheet Metal Worker: Efficient design and installation of energy-efficient heating, ventilation and air conditioning systems. Combines sheet metal and electrical work involving installation, wiring, service and repair of environmental control systems and the fabrication and installation of ductwork.

Pacific NW Ironworkers & Employers Apprenticeship Training Center

Occupation	Length of Training Program	Starting Hourly Wage
Ironworker	4 years	\$30

- Ironworker: Wind turbine erection and maintenance.

Glaziers Local 740 JATC

Occupation	Length of Training Program	Starting Hourly Wage
Glazier	4 years	\$31

- Glazier: Glazing techniques for energy efficiency; glass panel system installation; work on solar panels.

Heat & Frost Insulators & Allied Trades Local 36

Occupation	Length of Training Program	Starting Hourly Wage
Heat/Frost Insulator	4 years	\$30

- Heat/Frost Insulator: Heat loss prevention, process and domestic systems; cryogenics and energy conservation techniques; firestop techniques.

Painters JATC

Occupation	Length of Training Program	Starting Hourly Wage
Painter	4 years	\$16

- Painter: Use of low solvent materials for green buildings.

Roofers JATC

Occupation	Length of Training Program	Starting Hourly Wage
Roofer	3 years	\$26

- Roofer: Installation of eco-roofs.

Renewable Energy Joint Apprenticeship Training Committee/OSEIA

Occupation	Certification/ License	Length of Training Program	Starting Hourly Wage
Solar Installer	N/A	1 year	\$20
Renewable Energy Technician	Renewable Energy Technician license	2 years	\$20

- *Note: this is the one non-union apprenticeship program to respond to our survey.*
- Solar Installer & Renewable Energy Technician: Installation of renewable energy systems, including photovoltaic; limited to 25 KVA or less, off-grid.

Workforce Assistance Agencies

Oregon workforce development and assistance agencies comprise a broad and powerful network of strategic public and private partners working together to connect businesses with the resources and partnerships necessary to create, grow and adapt skilled workforce employees.

Oregon is in the process of undergoing workforce agency integration and restructuring to meet demands of emerging clean energy industries. This requires a whole system approach and structuring of new public and private partnerships between education institutions and industries to deliver highly trained workers with robust skill sets.

Contacting the local regional workforce investment board staff for the respective county of your region is the most efficient way to access to the statewide resource pool for assessment of your needs as an employee or employer.

(See Appendix F for a full list of Oregon's Regional Workforce Investment Boards.)

IV. Economic & Business Development Resources

While Oregon Economic and Community Development Department (OECD) is a state-level department, it has staff personnel who act as county liaisons. (To contact OECD staff listed by county affiliation, see Appendix D.)

There are five other sets of local-level organizations that may provide financial and business development assistance, and are likely to be of good sources of information about local projects underway and “how things work in our community.” The five include:

- **Regional Investment Boards**
- **Economic Development Organizations**
- **Small Business Development Centers**
- **Community Development Organizations**
- **USDA Rural Development**

Of these five, the Regional Investment Boards have loan and/or grant funds; the Economic Development Organizations may have funds available for loans or grants, as well as being able to provide useful advice and information; and the other two—Community Development Organizations and Small Business Development Centers—are primarily sources of information, advice, and/or training rather than funding.

Regional Investment Boards

There are currently 13 state-funded Boards, which receive a portion of state lottery monies. The Boards were established to identify and coordinate regional economic and community development priorities. The Boards make grants or loans in their respective communities. Recently, however, the Legislature has reduced the allocations to the Boards, redirecting the monies to education. Many Boards are staffed by their local Economic Development Organizations. It is probably most efficient to make contact with the staff first, since they typically recommend specific projects to their Board, and Boards may meet infrequently.

Baker-Morrow Regional Partnership

Staff: Greater Eastern Oregon Development Corp. (GEODC)

Karen Kendall

PO Box 1041

Pendleton, OR 97801

541-276-6745 p

541-276-6071 f

<http://www.geodc.org>

Benton-Lane-Lincoln-Linn Regional Investment Board

Staff: Cascades West Council of Government

Drew Foster

Cascades West EDD

1400 Queen Ave SE

Albany, OR 97322

541-924-8458 p

541-967-8551 p

541-967-4651 f

<http://www.ocwcog.org>

Central Oregon Community Regional Investment Board

Staff: Central Oregon Intergovernmental Council (COIC)

Andrew Spreadborough

COIC

2363 SW Glacier Place

Redmond, OR 97756

541-504-3306 p

541-548-8163 p

541-548-9548 f

<http://www.coic.org>

Coos-Curry-Douglas Regional Investment Board

Staff: Coos, Curry, Douglas Business Development Corp

Eileen Ophus

CCD Business Dev Corp

744 SE Rose Street

Roseburg, OR 97470

541-672-6728 x18 p

541-672-7011 f

<http://www.ccdbusiness.com>

Jackson-Josephine Regional Investment Board

Staff: Southern Oregon Regional Economic Development, Inc (SOREDI)

Colleen Padilla

SOREDI

673 Market Street

Medford, OR 97504

541-773-8947 p

541-779-0953 f

<http://www.soredi.org>

Lower John Day Regional Investment Board

Staff: Greater Eastern Oregon Development Corp. (GEODC)

Sondra Lino

GEODC

PO Box 579

Canyon City, OR 97820

541-575-2786 p

541-575-1068 f

<http://www.geodc.org>

Mid-Willamette Valley Community Development Partnership

Staff: Mid-Willamette Valley Council of Governments

Ray Teasley

Mid-Willamette Valley COG

105 High Street NE

Salem, OR 97301-3667

503-588-6177 p

503-588-6094 f

<http://www.mwvcog.org>

Mt. Hood Economic Alliance

Staff: McArthur and Associates

Mary McArthur

Mt. Hood Economic Alliance

4336 SW Condor Ave

Portland, OR 97239

503-228-5565 p

503-228-7456 f

<http://www.mthoodea.org>

Multnomah-Washington Regional Investment Board

Staff: McArthur and Associates

Mary McArthur

Multnomah-Washington RIB

4336 SW Condor Ave

Portland, OR 97239

503-228-5565 p

503-228-7456 f

[http://www.beaverton.org/images/SmallBusinessAppFlyer\(2Fold\).pdf](http://www.beaverton.org/images/SmallBusinessAppFlyer(2Fold).pdf)

Northeast Oregon Alliance

Staff: Northeast Oregon Economic Development District (NEOEDD)

Lisa Dawson

Northeast Oregon EDD

101 NE First St, Suite 100

Enterprise, OR 97828

541-426-3598 p

541-426-9058 f

<http://www.neoedd.org>

Northwest Oregon Economic Alliance

Staff: McArthur and Associates

Mary McArthur

NW Oregon Economic Alliance

4336 SW Condor Ave

Portland, OR 97239

503-228-5565 p

503-229-7456 f

<http://www.nworegon.org/default.asp?deptid=1&deptmainpage=true>

South Central Oregon Regional Investment Board

Staff: South Central Oregon Economic Development District

Deanna Wilson

South Central Oregon EDD

PO Box 1529

Klamath Falls, OR 97601

541-884-5593 p

541-882-9600 p

541-882-7648 f

<http://www.scoedd.org>

Southeast Regional Alliance

Staff: Greater Eastern Oregon Development Corp (GEODC)

http://www.geodc.org/Southeast_Regional_Alliance.htm

Economic Development Organizations

There are more than 50 organizations listed at the OECD website <http://econ.oregon.gov>, many of which have programs for loans and/or grants, generally less than \$100,000. In some instances these organizations are privately sponsored; other times they reflect joint efforts of the local business community and local government. In smaller communities, the organization may simply be the local government's planning department.

Albany Millersburg Economic Development Corporation

<http://www.albany-millersburg.com>

Baker City/County Economic Development Department

<http://www.bakercity.com>

Benton, Lincoln, Linn Regional Economic Development Commission

<http://www.ocwcog.org>

Central Coast Economic Development Alliance

<http://www.coastbusiness.info> (serves Lincoln County and its coastal communities)

Central Oregon Intergovernmental Council (serves Deschutes, Crook, and Jefferson counties)

<http://www.coic.org/>

Clackamas County Economic Development Agency

<http://www.co.clackamas.or.us>

Clatsop Economic Development Council

<http://www.co.clatsop.or.us/index.asp>

Columbia Gorge Economic Development Association

<http://www.cgeda.com>

Columbia-Pacific Economic Development District (serves Clatsop, Columbia, Tillamook and parts of Washington counties)

<http://www.nworegon.org/default.asp?deptid=2&deptmainpage=true>

Coos, Curry, Douglas Business Development Corp.

<http://www.ccdbusiness.com>

Corvallis/Benton County Economic Development Partnership, Inc.

<http://www.corvallisdp.com>

Economic Development Council of Tillamook County

<http://www.edctc.com>

Economic Development for Central Oregon

<http://www.coedc.org/> (see also www.coic.org)

Greater Eastern Oregon Development Corp. (GEODC)

http://www.geodc.org/Southeast_Regional_Alliance.htm

Harney County Economic Development Department and Committee

<http://www.harneycountyeconomicdevelopment.com/introduction.htm>

Hermiston Development Corporation

<http://www.betterlocations.com/hermiston> (profile only)

Hood River Economic Development Office

<http://www.co.hood-river.or.us>

Jackson Josephine Regional Economic Development Commission

(see Southern Oregon Regional Economic Development listing)

Jefferson County Economic Development

(see Central Oregon listings www.coic.org and www.coedc.org)

Klamath County Economic Development Association

<http://www.sobusi.com/kceda/>

Lake County Economic Development Department and Committee

<http://www.lakecountyor.org>

Lane Council of Governments (LCOG)

<http://www.lcog.org> (no specific information re: economic development)

Lane County Community & Economic Development

http://www.lanecounty.org/CAO_EconDev/default.htm

Lane Metro Partnership

<http://www.lanemetro.com>

Malheur County Economic Development Department

<http://ecodev.malheurco.org>

McMinnville Economic Development Partnership

<http://www.mcminnvilleedp.com> (also see next listing)

McMinnville Industrial Promotions, Inc.

<http://www.mcminnvilleindustrialpromotions.com> (also see preceding listing)

Mid-Columbia Economic Development District

<http://www.mcedd.org>

Mid-Valley Community Development Partnership

<http://www.mwvcog.org> (serves 42 local governments in Marion, Polk, and Yamhill counties)

Mt Hood Economic Alliance

<http://www.mthoodea.org> (serves Clackamas, Hood River and Wasco counties)

North Central Regional Development Commission

(see Greater Eastern Oregon Development Corporation listing)

North Santiam Canyon Economic Development Corporation

<http://www.growsantiam.org/index.html>

Northeast Oregon Economic Development District

<http://www.neoedd.org>

Northwest Oregon Economic Alliance

(see Columbia-Pacific listing)

Oregon Downtown Development Association

<http://www.odda.org> (helps communities revitalize, develop and promote their downtowns)

Portland Development Commission

<http://www.pdc.us>

Portland Office of Sustainable Development

<http://www.portlandonline.com/osd>

Rainier Economic Development Council

<http://www.redco-or.org>

Redmond Economic Development

<http://www.redap.org> (see also Central Oregon listings www.coic.org and www.coedc.org)

Round-up City Development Corporation

<http://www.pendleton.or.us/> main; <http://www.pendleton.or.us/indexeconl.htm>

Rural Development Initiatives, Inc.

http://www.rdiinc.org/02_about.html (assists rural communities in Northwest Oregon)

Salem Economic Development Corporation (SEDCOR)

<http://www.sedcor.org> serves Marion and Polk counties

Sherman County Economic Development & Planning

http://www.sherman-county.com/government_contacts.asp (see Community Development listings)

South Central Oregon Economic Development District

<http://www.scoedd.org> (serves Klamath and Lake counties)

South Coast Development Council

<http://www.scdcinc.org> main; <http://www.scdcinc.org/scdc-incentives.htm>

Southern Oregon Regional Economic Development, Inc.

<http://www.soredi.org> (serves Jackson and Josephine counties and communities in Rogue Valley region)

Umatilla County Economic Development

<http://www.co.umatilla.or.us/> and
<http://www.co.umatilla.or.us/planning/index.htm>

Umpqua Economic Development Partnership

<http://www.umpquaedp.org> (serves Douglas county)

Wallowa County Economic Development Council

see Northeast Oregon Economic Development District listing above
http://www.neoedd.org/documents/RDAT_Report.pdf (provides background information)

Wasco County Planning and Economic Development

<http://www.co.wasco.or.us>

Small Business Development Centers

There are currently 20 centers located throughout the state, mostly at community colleges. Their primary focus is business education and they provide counseling, training, information and technical assistance in all aspects of small business development, growth and management. Services such as assistance with business and marketing plans are free to Oregon businesses and entrepreneurs. Nominal fees are charged for some workshops, workbooks, and other materials. These centers are funded by state and federal funds. The state office overseeing and coordinating all SBDCs in Oregon has contact information for all centers throughout the state.

99 W 10th Ave Suite 390
Eugene, OR 97401-3015
541-463-5250
www.bizcenter.org
networkoffice@bizcenter.org

Community Development Organizations

While economic development organizations focus primarily on assisting developing businesses, a loosely defined set of organizations commonly referred to as community development organizations have more of a whole community focus. In many communities, economic and community development organizations function together. In smaller communities, the community development organization is often part of the city's or county's planning department. In larger communities, they can be independent or private organizations, funded by local government, businesses, and/or community members. Community development organizations are not typically sources of financing, but they often know how things get done locally. Topics of action include farming, healthcare, education and, increasingly, climate change and renewable energy.

The OECDDE site can be used to identify these organizations, but this is difficult. The best means of connecting with local organizations is to contact regional OECDDE staff. (See Appendix D.)

Additionally, ODOE has released a very rich guide that can assist all communities in developing a Community Energy Plan, which is a means for reviewing and evaluating community design options for a more efficient and sustainable use of energy.

(See: <http://www.oregon.gov/ENERGY/GBLWRM/docs/CommunityEnergyPlanningTool.pdf>)

The Community Energy Planning Tool was authored by:

Karen.Chase@state.or.us & Robin.Straughan@state.or.us

Phone: 503-378-4040 or 1-800-221-8035

USDA Rural Development

USDA Rural Development's Business & Cooperative Programs staff administers a variety of Federal loan guarantee, direct loan, and grant programs designed to create and retain jobs, support business and cooperative development, and promote sustainable economic progress in Oregon's rural communities. They work to build cooperative financial partnerships with rural Oregonians.

Included in the 2008 Farm Bill was the Rural Energy for America Program (REAP). REAP offers grants and/or loan guarantees for the purchase and installation of renewable energy generating systems and for energy efficiency improvements. See Federal Level Financial Incentives for additional information.

As the USDA Rural Development states very succinctly on their site, "websites have their value, but sometimes the best way to see how we can work together is by a personal contact."

(See Appendix E for a list of Oregon USDA regions and contact information.)

V. Oregon Clean Energy Case Studies

Communities, businesses and entrepreneurs are developing local clean energy resources, projects, programs and businesses all across Oregon. These entities, however, all too often exist in relative vacuums. Many are largely unaware of the efforts underway in neighboring communities and are missing opportunities to leverage additional resources and knowledge.

The following pages display case studies of renewable energy and energy efficiency / conservation projects alongside the bodies that came together to actualize these projects and bring them online. Due to constraints on the size of this project, these are just samples of the types of projects underway in the various clean energy sectors.

Wind

Umatilla County – Stateline Wind Farm

This wind generation facility is located in southern Walla Walla County, WA and in Umatilla County, OR (20 miles west of Walla Walla, along the Oregon-Washington border). The Stateline project is several miles northwest of the Vansycle Wind project in Umatilla County, OR. The project is located entirely on private farmland, which is primarily used for dryland wheat farming and cattle grazing. Agricultural activities take place adjacent to the turbine pads. When fully developed, the Stateline project will have a total capacity of 320 megawatts (MW), which will make it one of the largest wind projects in the world.

The Turbines: The Stateline Wind project consists of 454 660 kilowatt Vestas V47 turbines. Of these, 186 turbines with a capacity of 123 MW are sited and in operation in Oregon, and 268 turbines are sited in Washington State. An additional 279 turbines with a projected capacity of 184 MW have been approved for construction in Oregon but have not yet been installed. The turbines are 165 feet tall at the hub, and 245 feet tall including the turbine blades. The diameter of the “swept area” covered by the rotors is about 154 feet. The Stateline wind project generates enough energy to serve 26,500 homes, more than the number of homes in the city of Medford, Oregon.

The project is owned and operated by Florida Power and Light. PacifiCorp Power Marketing purchased the entire output of the facility and resold a portion to Bonneville Power Administration (BPA). BPA has a 25-year power purchase agreement for 90 MW of Stateline capacity. (See: www.bpa.gov/Power/pgc/wind/Wind_Project_Summary_Stateline.pdf)

Contact:

William M. Hayduk
FPL Energy, Inc.
P.O. Box 14000
Juno Beach, FL 3348
561-304-5108

Umatilla County - Combine Hills Wind Farm

In 2003, Energy Trust of Oregon provided a \$3.8 million incentive to Pacific Power to support the development of a 41 MW wind farm in northeastern Oregon. The Combine Hills project uses 1 MW Mitsubishi turbines that are 55 meters high. The energy from this wind farm is enough to supply about 12,000 average households in Pacific Power’s service territory. Located south of Umapine, and west of Milton-Freewater, OR, Combine Hills Turbine Ranch I is the newest energy

project owned by Eurus Energy of America (EEA), and the first wind farm funded with help from the Energy Trust of Oregon, Inc. (See: www.energytrust.org/RR/us/index.html)

Sherman County (RREDZ) – 3 existing wind projects and 5 future wind projects

The following table of Sherman County Wind Farms is provided by Georgia Macnab, Sherman County Planning Director:

Name	Owner	Megawatts	Towers	Built	Tax Incentive
Klondike I	PPM Energy	25	16	Yes	None
Klondike II	PPM Energy	75	50	Yes '05	EZ 3yrs; \$84mil
Klondike III	PPM Energy	375	208	Yes '06	SIP 15 yrs; \$400mil
Biglow	PGE	450	150	Phase I '07, Phase II '08	SIP 15 yrs; \$260mil
Oregon Trail	PaTu Wind Farm	10	4	No	RREDD 3yrs
Hay Canyon	PPM Energy	105	50-70	2008	NA
Golden Hills	BP	400	267	Not permitted	NA
Starpoint	PPM Energy	NA	NA	NA	NA

PPM Energy is now Iberdrola Renewables

Contact for the county:

Georgia Macnab
Sherman County Planning Director
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Moro, OR 97039
541-565-3601
georgiamac@embarqmail.com

OR

Gary Thompson, Sherman County Judge
PO Box 365
Moro, OR 97039
541-565-3416
Sherman County www.sherman-county.org

Geothermal

In Klamath Falls, there are 550 geothermal wells that provide heat for as many as 1,000 homes. The city itself utilizes the geothermal resource for a district heating system that provides heat for more than 25 churches, government and commercial buildings, and more than 40 connections for melting snow from sidewalks and roads. The total system load is about 13 million Btu/hr. One of the latest customers for the Klamath Falls district-heating system is a greenhouse complex run by IFA Nurseries, Inc. This complex has two 50,000 square-foot greenhouses with capacity to produce 4 million seedlings of ponderosa pine, hemlock, and other tree species.

Since geothermal heating is more efficient than combustion of natural gas, the cost to customers heating with geothermal energy can be 50 to 80% of natural gas, depending on the efficiency of the gas furnace.

Specific examples of savings include:

- The Oregon Institute of Technology in Klamath Falls, uses geothermal energy to heat almost 100% of its 600,000 ft² of buildings, saving approximately \$300,000 per year;
- The Merle West Medical Center in Klamath Falls, uses geothermal energy to heat 480,000 ft² of buildings and to melt snow off sidewalks, saving \$180,000 annually;
- Gone Fishing aquaculture, whose use of geothermal energy avoids 24 million kilowatt-hours of electricity annually, saves approximately \$1,350,000;
- The Warner Creek Correctional Center, a 400-bed facility being built in Lakeview, will use geothermal energy to heat the facility, avoiding the use of 180,000 gallons of propane per year, for an annual savings of more than \$100,000.

Klamath Falls isn't the only Oregon community utilizing geothermal heating to reduce heating costs and avoid fossil fuels. More than 30 other communities have been developing systems to use geothermal heat, including Lakeview, La Grande, Vale, and other eastern Oregon cities.

In August of 2008, the Oregon Institute of Technology announced plans to construct a \$7.6 million geothermal power plant on campus. The plant will become the sole power source for the school in a few years, making Oregon Tech the only university to be powered completely by geothermal energy.

GEO-HEAT CENTER
Oregon Institute of Technology
541-885-1750
or
City of Klamath Falls
541-883-5388
CityPublicWorks@ci.klamath-falls.or.us

Solar

Portland General Electric

In December of 2008, Portland General Electric (PGE) and its partners rolled out the largest solar project in the Pacific Northwest, which is capable of producing up to 1.1 megawatts of electricity for PGE customers.

The project, using thin-film solar panels, is being installed on the rooftops of three ProLogis distribution warehouses in northeast Portland. The solar panels cover more than 328,000 square feet. U.S. Bank, ProLogis, Energy Trust of Oregon, United Fund Advisors and Solar Integrated Technologies worked with PGE to make the project possible.

U.S. Bank and PGE formed SunWay 2, LLC, to own and operate the system and to secure state and federal solar tax credits to help finance the project. The financing package was arranged by United Fund Advisors (UFA). In August, PGE and US Bank formed a similar joint venture to finance the nation's first solar highway project for the Oregon Department of Transportation. In addition, Energy Trust of Oregon, is providing approximately \$1 million in incentives for the project. Solar Integrated Technologies, Inc. has been selected to integrate and install the system.

Portland General Electric
Elaina Medina
503-464-8790

City of Ashland – Conservation and Clean Energy Programs

The City of Ashland has promoted the use of renewable energy since 1981, when it passed one of the first citywide solar access protection ordinances in the United States. In 1996, the City Council passed a net-metering law, establishing a simple grid interconnection policy and encouraging solar systems. The City offers numerous conservation programs to citizens, providing expert advice, free audits and rebates.

Solar Pioneer Program

Ashland utility customers voluntarily added a Solar Pioneer surcharge to their electric bill, paying increments of \$4.00/month to support photovoltaic installations at the Civic Center, Oregon Shakespeare Festival (OSF), and Southern Oregon University (SOU). Solar Pioneers was also supported by BEF, both financially and through donated staff time. Funds from this program are used to reimburse OSF and SOU for solar electricity at \$.25/kWh, until their investments are fully reimbursed, which will take 8-12 years. From 2000-2002, over 260 citizens and businesses generated nearly \$30,000 to finance local solar projects.

Bonneville Environmental Foundation (BEF)

The City of Ashland has partnered with BEF on several successful projects. BEF contributed about \$60,000 to fund and build Solar Ashland, which encompasses the solar installations at the Civic Center, Oregon Shakespeare Festival, and SOU. At the time of its construction, Solar Ashland was the largest solar plant in the Pacific Northwest. The City also received guidance from BEF to develop, market and implement the Solar Pioneer program (noted above). In 2003, BEF provided funding to Ashland for the solar project at the Wilderness Charter School, which provides on-site renewable electricity for the school and is used in hands-on academic projects. In March 2003, Ashland City Council approved a recommendation from the Ashland Conservation Commission to create an affiliate partnership with the BEF that would allow utility customers to support renewable energy. The City of Ashland encourages utility customers to participate in the Renewable Pioneers program by purchasing Green Tags from BEF.

Solar Pioneer II

In its latest solar program, the City of Ashland has orchestrated an innovative 63.5 kilowatt community solar system to bring renewable energy to the area in a way that is affordable and does not require home installation. The project is financed in part by Clean Renewable Energy Bonds (CREBs) and the State of Oregon's Business Energy Tax Credits (BETC) through a partnership with Bank of the Cascades. The BEF provided program design and marketing support.

Located on city-owned property and installed by Advanced Energy Systems of Eugene, the system consists of 363 175-watt PV panels that will generate 83,000 kilowatt hours annually. Ashland customers may purchase the output of panels for 20 years. A full panel can be purchased for \$825, a 1/2 panel for \$412.50 or a 1/4 panel for \$206.25. To date, 73.5 panels have been sold. The city will be responsible for the maintenance of the system, and each year, will credit the electric bill of participants for the amount of renewable electricity their panels have generated. The system is estimated to reduce 100,000 pounds of greenhouse gasses annually.

Known locally as Solar Pioneer II, the project is designed to build on increasing community interest in solar energy to generate electricity. The project overcomes the two major obstacles standing in the way of installing more home solar electric systems; the initial high cost for a solar electric system and property lacking good solar exposure.

Dick Wanderscheid
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Biomass, Biowaste and Biofuels

City of Gresham Wastewater Treatment Plant

In November, 2005, the City of Gresham completed installation of a 395 kW combined heat and power (CHP) system at the city's wastewater treatment plant, converting organic bio waste into electricity and heat. The system is powered by the plant's digester gas.

Project Benefits:

- Generates clean, renewable power; Provides process heat for the plant's digesters and space heat for the facility's administrative building
- Reduces facility energy costs by \$18,000–\$20,000 per month
- Enhances reliability by providing facility power during utility outages
- Reduces the need for power generation from fossil fuel, and associated environmental impacts

Project Team: City of Gresham Wastewater Services, Energy Trust of Oregon, Oregon Department of Energy, California Power Partners, Portland General Electric
(See http://www.energytrust.org/library/case_studies/GreshamWastewater_CS.pdf)

Guy Graham
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Jackson County, White City Biomass One (Wood Waste to Fuel)

Biomass One is a 25 MW, wood waste fired cogeneration plant which annually recovers and processes 302,000 tons of wood waste logging and land clearing debris material that would otherwise be land filled or open burned. Local public and area businesses provide Biomass One with wood waste for fuel. Additionally, waste wood is recovered from six county landfills in Southern Oregon and Northern California. The recovered wood waste is converted into electricity and steam. Through its advanced air quality control system Biomass One is able to achieve a 500 to 1 reduction in particulate emissions through burning wood fuel in their facility as opposed to open air combustion. All electricity is sold to Pacific Power for distribution to their customers in the Rogue Valley. Biomass One produces enough power to satisfy the needs of over 20,000 homes. Biomass One employs 67 people across all segments of its operation.

John Bremerman, General Manager
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City of Lakeview, Biomass Project

The Lakeview Biomass Project is an Oregon Solutions project, an initiative that evolved from the Oregon Sustainability Act of 2001.

This project supports forest health with a management plan for ecological restoration of the forest while also creating an opportunity for economic growth and job creation in the area. The project, scheduled to be built, and brought to commercial operations scale by 3rd quarter 2009 is a 13 MW biomass power plant. Located in Southern Oregon initial capital investment exceeded \$25 million. The plant will employ 18 full time personnel and spur new growth of approximately 60 local jobs in mills and forest thinning that support plant operations. By consuming approximately 250,000 gross tons of forestry biomass material annually from regional lumber mills and national forest it offers a solution to forests that suffer from overcrowding, decades of fire suppression, insect and disease epidemics.

All this fuels the co-generation electrical facility that will convert non-merchantable biomass from thinning operations and sawmill wood by-products to steam used to produce energy for Collins Company Freemont Mill in Lakeview and additional power that will be fed to the grid. Collins Company installed a new small diameter timber processing line to maximize the value-added of the biomass materials.

Key partners include OSU, Central Oregon Council of Government, Portland State University, The Collins Companies, Marubeni Sustainable Energy, Fremont National Forest, Lakeview BLM District, Oregon Department of Forestry, Oregon Department of Energy, Lake County Resources Initiative, The Wilderness Society, 3EStrategies, Oregon Natural Resources Council, Central Oregon Environmental Council, and other groups.

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king-p@na.marubeni.com

Jim Walls
Lake County Resources Initiative
541.947.5461
jwalls@gooselake.com

SeQuential Biofuels

The SeQuential Biofuels project shows that new uses for old gas stations may lie in their reuse as “fueling stations of the future.” In this case, the 0.7-acre property located in southeastern Eugene, Oregon, had operated as a filling station from 1976 through 1991. During that time, its underground storage tank systems had leaked, contaminating soil and groundwater on the property and beyond. Fortunately, the site’s location made it a natural for redevelopment as a biofuel station, the first brownfield reuse of this type ever undertaken. In January 2005, Lane County directed the removal of over 400 tires, 15 drums of investigation wastes, hundreds of needles, and other surface debris from the property. The county also secured an EPA brownfield cleanup grant. This was followed by a lease-purchase agreement between the county and SeQuential, and a prospective purchaser agreement between SeQuential and Oregon’s Department of Environmental Quality (DEQ).

In addition to launching a new line of brownfield reuse opportunities, the project team assembled a creative financial package to ensure its completion. The Oregon Department of Energy provided \$1.2 million in low-interest, favorable-term redevelopment loan funding for the project through its

Sustainable Energy Loan Program. Additionally, the project earned \$250,000 in business energy tax credits that helped make the energy efficiency and alternative fuel components of the project possible. Lane County Board of Commissioners, Oregon Department of Environmental Quality and Oregon Economic and Community Development Department were also key partners.

In addition to providing biofuels, SeQuential set out to build the greenest facility possible, incorporating many sustainable development elements into its design, including solar power and passive solar heating. The green roof contains almost 5,000 plants in six inches of soil; this slows the flow of rain water and helps to keep the convenience store cool in the summer by deflecting the intense summer sun. Bioswales slow and contain runoff from the site, enhancing biological remediation before it leaves the site. The facility also offers locally sourced and organic products in its convenience store.

Since the biofuels service station opened in August 2006 the project has met a range of environmental and community development goals. Today, the former gas station is a mixed-use property that provides bio-diesel fuels to a growing fleet of environmentally friendly vehicles. Ten jobs have been created at a former abandoned site and \$4,000 in annual property tax revenues have been generated from a property that had been tax-delinquent.

Jim Glass
Oregon Dept. Environmental Quality
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Conservation/Efficiency Technologies

Gresham-Barlow School District 10

Gresham-Barlow School District 10 in Oregon serves K-12 students in nineteen schools, and has a student population of more than 12,000. In 1998, in an effort to reduce energy and water consumption, the District adopted an energy policy and invested in building infrastructure, hardware, and the purchase of energy management software.

Since the implementation of the energy management program, the District has saved a total of \$4.3 million. The District has also decreased its overall utility use by 46%. To put this in perspective, last year's savings represent the salaries for approximately 21 teaching positions. As a result of the District's outstanding energy management efforts, it earned the prestigious 2006 ENERGY STAR® Partner of the Year Award as well as the ENERGY STAR Leader Award by the Environmental Protection Agency (EPA) and the U.S. Department of Energy.

Item	1997/1998	2004/2005	% Change
Actual Utility Cost	\$1,456,431	\$1,598,561	9%
Total Energy Consumption (Mbtu)	129,292	78,771	-38%
Electricity Consumption	16,087,928	10,584,280	-34%
Natural Gas Consumption	744,034	426,581	-43%
Square Feet	1,678,578	1,725,095	3%
Number of Students	10,980	11,928	8%

The table above represents comparative costs and consumption from school years 1997/1998 and 2004/2005. These comparisons reflect the progress Gresham-Barlow School District has made since the inception of their energy

management program and implementation of conservation / efficiency technologies. The reductions are illustrated are in the face of increases in square footage; students; utility rates; and other factors.

Oregon Department of Energy Schools Team
1-800-221-8035, OR

Dave Cone
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503-667-6497
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Fuel Cell

Oregon State Police Fuel Cell System: Backup Power for Telecommunications, Homeland Security and Tsunami Warning Center Site

The Oregon State Police (OSP) operates a telecommunication site located at Cape Perpetua, Oregon, the highest point along the state's coastline. The site provides telecommunications and radio transmission in the region for OSP and the Department of Homeland Security. Additionally, the site hosts the regional tsunami warning system.

Due to the requirement of maintaining continuous and uninterrupted operations, the telecommunication tower and transmitters require a backup power system. A fuel cell system from fuel cell manufacturer Idatech, based in Bend, Oregon, was selected to reliably charge the on-site battery string and ensure continuous power. The technology is attractive to OSP, as the power plant provides up to 3 kilowatts of continuous charging power regardless of weather or time of day.

Erik Simpkins
Idatech
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541.383-3390

Small Hydro

Central Oregon Irrigation District: 3.5 megawatt hydro system

The Central Oregon Irrigation District (COID) manages the Pilot Butte Canal, which runs for 22 miles from Bend to Terrebonne. COID is in the process of piping more than two miles of canal and installing two 2.5 MW hydroelectric turbines.

The piping project will eliminate water loss through the canal and place 20 cubic feet per second (CFS) of water permanently in the Deschutes River. The generator will run for 180 days during the irrigation season, from mid-April to mid-October. The project's total costs of \$22.3 million will be reduced by \$7 million in grants related to water conservation and a \$1 million Energy Trust incentive. The project is scheduled for completion in 2010 and is expected to sell 13,435 megawatt hours of electricity to Pacific Power each year.

Swalley Irrigation District: 750 kW hydro system

The Swalley Irrigation District transports water in a canal from Bend to south of Redmond. The district is piping five miles of the 12 mile canal for conservation purposes, permanently returning 27 cfs to the Deschutes River. The pipe will produce enough pressure to engage a 750 kW turbine, generating 2,752 MWh of electricity each year. The turbine will run during the irrigation season, from April 1 to October 31. The project's total cost of \$10.4 million was reduced through \$4.2

million in grants related to its watershed benefits, a \$916,000 incentive from Energy Trust and pass-through funds from an Oregon Business Energy Tax Credit. The project is expected to be completed in 2009.

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Ocean

Generation of electricity through conversion of ocean current, swell, wave action, tidal gradients, and thermal gradients is undergoing successful research and developed around the world. The most promising applications for harnessing of ocean energy are offshore use of the consistent rise and fall of swells along deep-water shorelines where there is significant year-round wave action, making many locations along the Oregon coast prime for development. A report by the Electric Power Research Institute identified seven sites along the Oregon coast as being potentially suitable for siting a wave energy power plant. Oregon was the site of the nation's first filing for a commercial wave energy park with the Federal Energy Regulatory Commission (FERC). The FERC has jurisdiction to site wave facilities under the Energy Policy Act of 2005.

It is worth noting that the number of wave energy projects waiting for FERC preliminary permits dropped from six in 2007 to none in 2008. (This compares to an *increase* in new, preliminary permit applications for tidal energy projects, as opposed to wave energy projects, from 29 in 2007 to 63 in 2008.) The drop points to a drying up of initial interest in wave energy projects (in spite of continued interest in tidal energy projects). Observers are waiting to see how those projects with preliminary permits (five of which are in Oregon) will fare.

The following early stage development efforts have set the stage for coordinated, well integrated permitting and licensing process between public, private and non-profit partners and the Federal Energy Regulatory Commission:

Florence. Australia-based Oceanlinx (formerly Energetech) had filed for a Federal Energy Regulatory Commission (FERC) preliminary permit for a 10-MW project off Florence. The proposal entailed oscillating water column (OWC) devices covering a 2.3 mile by 5.1 mile footprint on territorial waters. This year the company withdrew its permit application and appears focused on its Rhode Island project, as well as projects in Australia. The company's lead developer for the Oregon project and her successor no longer work for the company.

Lincoln County. Lincoln County submitted a preliminary permit application for a wave energy project off its coast. The permit covered the entire coast, presumably to secure nine potential project sites that would each hold generation between 20 and 180 MW. Based on FERC's concern that they were merely attempting to block out other developers from their county, the county then focused on permitting a test site off Newport. However, now the County is no longer pursuing the application.

Bandon. Finavera's Bandon project, which proposes a maximum of 100 MW using point absorber buoys and a first phase of 2 MW, is still under development. However, Finavera is facing financial challenges associated with a sharp drop in its stock price. The price drop appears to be due to at least a couple of factors, including the general decline of the stock market, and the lack of near-term, cash-generating projects to sustain the company as it pursues longer-term wave energy projects. The company had touted its wind energy project development in British Columbia. However, no projects have materialized. At this time, it is not certain if Finavera will be able to maintain a vigorous development effort in Oregon.

Reedsport. Ocean Power Technologies (OPT) is pursuing two projects in a coordinated effort with the City of Reedsport, Douglas County Commission, Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw, National Marine Fisheries Service, U.S. Army Corps of Engineers, Oregon Department of Energy, Oregon Department of Land Conservation and Development, and Oregon Department of State Lands. OPT has received a FERC preliminary permit for its Reedsport Wave Park project, which it plans to hold 200 point absorbers on a 0.4-by-3.1-mile area. OPT submitted a FERC license application last year with an intention to install a test buoy on the site this year. The company is still pursuing a 2-MW project with 10 buoys for 2009 deployment.

Coos Bay. The second project OPT is pursuing consists of a 100-MW project in Coos Bay that it hopes to install between 2011 and 2013. Unlike its Reedsport project, and unlike most other project efforts in the state, OPT intends a full build-out of the Coos Bay project rather than a phased development. The company believes that permitting costs are too high—exceeding \$1 million—to support a small scale project that will be attractive to power purchasers.

Douglas County. Douglas County intends to develop a small-scale project abutting an Army Corps of Engineers jetty at Winchester. FERC issued a preliminary permit to the county in May 2008. The county intends to partner with British “heave” (oscillating water column) device manufacturer Wavegen for the 3-MW project. The county last year intended to install the device within three years.

Tillamook County: The Tillamook Intergovernmental Development Entity (TIDE), a partnership between Tillamook PUD and Tillamook County, submitted a preliminary permit application to FERC in October 2007 for five one-mile-by-three-mile sites at the edge of the territorial waters near Tillamook PUD substations. The sites are located off Nehalem, Rockaway, Garibaldi, Netarts, Neskowin and Nestucca. Each site would hold 5 to 90 wave buoy generators having a total installed capacity of 20 to 180 MW. (The type of generator is not yet known.) FERC issued the preliminary permit in May 2008.

The expansive field of ocean energy is one of the newest amongst emerging the renewable fields and evolving quite rapidly. For additional information of the permitting, licensing and regulatory process along with analysis specific projects, their barriers and steps being taken to overcome those barriers contact the following representatives:

Virinder Singh
Hat Trick Energy and Environment Consulting
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503-729-0557 or

Bob Bailey
Oregon Department of Land Conservation and Development
Coastal Management Program
bob.bailey@state.or.us
503-373-0050 x 281 or

Ashley Jackson
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ashley.jackson@energytrust.org
1-866-368-7878

Sources

Oregon's Renewable Energy Action Plan (REAP)
Oregon Department of Energy. April 2005.

State of Oregon Energy Plan 2007-2009 (ODOE Energy Plan 07-09)
Oregon Department of Energy. March 2008

Oregon Establishes Wave Energy Trust (Clean Edge 2008)
Clean Edge. January 2008.

Community Wind: An Oregon Guidebook
Northwest Sustainable Energy for Economic Development (SEED). November 2005.

Geothermal Technologies Program: Oregon (DOE 2005)
U.S. Department of Energy (DOE): National Renewable Energy Laboratory. February 2005.

Appendix A

Summary of Energy Legislation Passed by the 2007 Oregon Legislature

Governor Kulongoski's Renewable Energy Package

Senate Bill 838 - Renewable Portfolio Standard (RPS)

Senate Bill 838 establishes a Renewable Portfolio Standard (RPS) for electricity. The bill requires that 25% of Oregon's electric load come from new renewable energy by 2025. The RPS sets interim targets of 5% by 2011, 15% by 2015 and 20% by 2020. The RPS requirement of 25% by 2025 applies to electric utilities and any electricity service suppliers that serve at least 3% of Oregon's electric load. This covers Oregon's three largest electric utilities with over 75% of Oregon's electric load. Depending on load growth, this will likely cover most of the new resources needed to meet these utilities' new load.

Oregon's 31 smallest consumer-owned utilities that serve less than 1.5% of Oregon's electric load are exempt from the 25% standard but must meet 5% of their load from new renewable energy by 2025. Utilities which serve between 1.5% and 3% of Oregon's load must meet 10% of their load from new renewable energy by 2025. These lower targets for the smaller utilities require these utilities to avoid new acquisition of coal, except for limited circumstances.

Eligible renewable resources include wind, solar, ocean, geothermal, biomass, hydropower and other renewable resources that were operational after January 1, 1995. Eligible generating facilities do not have to be located in Oregon but at least 80% of the electricity from these resources must serve Oregon loads.

No utility will be required to give up access to low-cost firm power from BPA or low-cost hydro contracts with the Mid-Columbia dams owned by Washington PUDs. The RPS is not expected to increase rates; but a cost cap is built in as a backstop to limit any possible cost impact.

Compliance with the RPS can occur by owning eligible resources, by buying the output of resources developed by others, or by acquiring a limited number of unbundled Renewable Energy Certificates.

The public purpose charge is extended through 2025. Use of the renewable energy portion of the public purpose charge is limited to small-scale renewable energy projects 20 megawatts or less to encourage a diversity of the types of renewable energy resources developed. There is a non-binding goal that one-third of the renewable energy resources will be small-scale renewable energy projects. The bill also authorizes investor-owned utilities to provide financing for energy conservation beyond what is provided by utilities through the public purpose charge.

House Bill 2210 - Biofuels Fuels Package.

House Bill 2210 provides a package of measures to encourage greater development, distribution and use of agricultural and forest material for biofuels, for electricity and for other forms of biomass energy use. The bill expands property tax incentives for biofuel and certain fuel additive production facilities, establishes a new tax credit for producers and collectors of biofuel raw materials, based on Btu content of feedstock, and creates an income tax credit for consumer use of biofuel.

House Bill 2210 also establishes a Renewable Fuel Standard for biodiesel and ethanol based on in-state production, prohibits the sale of gasoline that contains MTBE and certain other additives, provides a mandate on State agencies regarding biodiesel for backup power generation, modifies the site certificate exemption criteria for ethanol and biodiesel production facilities to preclude coal-

fueled facilities, and allows certain farm biofuel production facilities on land zone for exclusive farm use (EFU).

House Bill 2211 – (Included in House Bill 3201). Business Energy Tax Credit (BETC).

House Bill 2211 amends the Business Energy Tax Credit to provide greater incentives for renewable energy. It was added to House Bill 3201, which contains a number of other tax credits. The bill increases the tax credit for renewable energy systems installed by businesses from 35% to 50% and increases the project cost limit from \$10 million to \$20 million. It also provides that the costs of constructing facilities to manufacture renewable energy systems and components are eligible for the increased tax credit for renewable energy.

House Bill 2211 / House Bill 3201 also makes combined heat and power projects (CHP) eligible for the increased tax credit, increases the size of hydro projects eligible for the tax credit from 1 megawatt to 10 megawatts for hydro projects meeting state and federal requirements for fish and wildlife, and repeals the offset of federal tax credits for projects which receive a federal and state credit.

The bill also clarifies the ability of investor-owned utilities to serve as pass-through partners for purposes of transferring the tax credit to others with little or no tax credit liability. It also provides an incentive to builders of high performance homes that reduce purchased energy use to near zero on an annual basis and makes homebuilders eligible for installation of renewable energy systems in new homes but at the value of the Residential Energy Tax Credit.

The bill applies to any project constructed or installed after January 1, 2007.

House Bill 2212 – (Included in House Bill 3201) Residential Energy Tax Credit (RETC).

House Bill 2212 was also included in House Bill 3201. It allows use of the residential energy tax credit for more than one qualifying item in the same year, e.g. for a solar water heater and for a solar electric system, and/or for multiple energy-efficient appliances. The bill also increases the maximum tax credit for fuel cells and for wind generation from \$1,500 to \$6,000 over four years.

The bill applies to any project constructed or installed after January 1, 2007.

Other Senate Bills:

Senate Joint Memorial 1 – Hanford Resolution.

SJM 1 urges Congress to provide the necessary funding to clean up the nuclear weapons wastes at the US Department of Energy's Hanford Site. SJM 1 also urges a role for the State of Oregon in decisionmaking at Hanford, including a role in the Hanford Tri-Party Agreement.

Senate Bill 118: -- Abnormal Market Disruptions.

Senate Bill 118 authorizes the Governor to declare an abnormal disruption of market under certain circumstances. Certain essential consumer goods and services are covered including petroleum products and diesel fuel. During the period of a declared abnormal disruption of market limits are imposed on the price increase allowed for goods and services covered by the declaration.

Senate Bill 375: -- Appliance Efficiency Standards.

Senate Bill 375 establishes energy efficiency standards for certain appliances and electrical equipment, based on standards adopted by California and other states. The bill covers bottle-type water dispensers, commercial hot food holding cabinets, compact audio products, digital versatile

disc players and recorders, portable electric spas, and walk-in refrigerators and freezers. The bill also gives rulemaking authority to the Department of Energy to adopt additional efficiency standards under certain circumstances.

Senate Bill 461: --Low Income Energy Assistance.

Senate Bill 461 increases from \$10 million to \$15 million annually the amount paid by PacifiCorp and Portland General Electric to the Department of Housing and Community Assistance for low income energy assistance.. This amount is in addition to the public purpose charge paid by these utilities for energy efficiency and renewable energy.

Senate Bill 479: -- School Light Fixture Bill.

Senate Bill 479 requires schools to remove all R type metal halide or mercury vapor light bulbs with T type light bulbs or with alternative lighting such as fluorescent lights by January 1, 2008. The T type and other alternative lighting are less hazardous and more energy-efficient than R type metal halide lights.

Senate Bill 790: -- Off-shore Leasing.

Senate Bill 790 prohibits leases within the state territorial sea (up to three miles seaward from the coastline) for any form of exploration, development or production of oil, natural gas or sulfur. The ban does not apply to exploration for scientific or academic research or for geologic survey purposes.

Senate Bill 812: -- PUD Statute Changes.

Senate Bill 812 makes a number of changes to the statutes governing peoples' utility districts (PUDs) so that PUDs can implement the Renewable Energy Standard contained in SB 838. These include the authority under certain circumstances to acquire renewable energy resources, to purchase renewable energy certificates, and to undertake other measures.

Senate Bill 814: -- Biofuels Bill Changes.

Senate Bill 814 makes two changes to the biofuel producer tax credit contained in House Bill 2210. It removes corn grain as an eligible feedstock from the biofuel producer tax credit and delays for two years wheat from eligibility for the producer tax credit. It does not preclude use of corn stalks, wheat wastes and similar material for the tax credit for cellulosic conversion to biofuel.

Senate Bill 819: -- Tax Credit / Kicker Refund Adjustment.

Senate Bill 819 makes revisions in the Oregon tax code so that purchasers of tax credits do not have the value of their tax credits reduced by a kicker refund due to revenues greater than 2% of the revenue forecast. This change benefits pass-through partners for the Business Energy Tax Credit as well as individuals and businesses who are transferred other tax credits for cash payment.

Senate Bill 875: -- Ocean Energy Rules.

Senate Bill 875 authorizes the Department of State Lands to develop rules relating to wave energy facilities. The rules may include requirements for site restoration and that the operator of a wave facility has evidence of financial assurance to meet the site restoration requirements. Senate Bill 875 also clarifies that ocean wave energy is distinct from hydroelectric energy and qualifies for the Business Energy Tax Credit as a separate form of renewable energy.

Other House Bills:

House Bill 2272: -- Vehicle Emission Standards.

This legislation requires that new vehicles, beginning with the model year 2009, must comply with low emission standards of the Environmental Quality Commission in order to register the vehicle. In addition, the bill authorizes the Oregon Department of Transportation to deny registration to 2009 or later model year vehicles that do not comply with the new standards. This bill provides additional enforcement for the tailpipe emissions rules that the Oregon's Environmental Quality Commission (EQC) adopted in June 2006 requiring that new vehicles meet California auto emission standards. Besides cleaner air the standards result in increased vehicle efficiency.

House Bill 2565 : -- Appliance Efficiency Standards.

House Bill 2565 makes technical changes to two classes of equipment adopted as part of a package of appliance efficiency standards in 2005 by House Bill 3363. The changes are to single-voltage external AC to DC power supplies, and to incandescent reflector lamps. The changes make the requirements consistent with those adopted by California and other states which were modified after the adoption of House Bill 3363 in 2005.

House Bill 2565 also gives the Department of Energy the authority through rule to make modifications in energy efficiency standards to be consistent with the standards and the timing of the effective date of such standards in adjoining states and under other limited circumstances.

House Bill 2620: -- Solar Energy in Public Buildings.

House Bill 2620 provides that a state or local government must devote at least 1.5% of the cost of constructing a new building or renovating an existing building to solar energy technologies if the building receives state funds. Passive solar energy investments can meet the requirement if passive solar reduces energy use by at least 20%. The Department of Energy will establish rules and forms for determining the appropriateness and cost-effectiveness of the 1.5% requirement.

The 1.5% solar requirement carries over to future projects by the agency if the project is determined to be inappropriate or not cost-effective for solar use. This requirement is also in addition to the existing statutory requirements of state agencies to design and build state buildings to meet energy efficiency savings requirements.

House Bill 2628: -- Outdoor Lighting Brightness.

House Bill 2628 directs the Department of Energy to evaluate state statutes and building codes regarding outdoor lighting impacts on energy efficiency and night brightness. Upon release of a model lighting ordinance by the International Dark-Sky Association and the Illuminating Engineering Society of North America the Department shall review the ordinance and make recommendations for adoption of the ordinance in the state building code and in local ordinances. The Department will make its findings available in a report to the Legislature by October 1, 2008. In enacting the bill, the Legislative committee encouraged the Department to establish a broad-based stakeholder group to assist in review of the model ordinance.

House Bill 2925: -- Small Wave Energy Facility Licensing Exemption.

House Bill 2925 provides that a wave energy project located within Oregon's Territorial Sea is exempt from a water right permit and related licensing requirements of the Water Resources Department if the project does not exceed 5 megawatts and if a federal license is not required under the Federal Power Act to construct or operate the project.

House Bill 3244: -- Sustainability Board

House Bill 3244 reestablishes the Sustainability Board as a statutory board. The Sustainability Board is directed to identify, evaluate and recommend changes in laws, rules and policies to sustain, enhance and protect the quality of the environment, economy and community for the present and future benefit of Oregonians.

House Bill 3488: -- Solar Incentives.

House Bill 3488 expands the property tax exemption for residential use of solar energy to business and other uses of solar and other renewable energy systems, including systems which can be used for net metering. The exemption sunsets July 1, 2012. The bill also authorizes the Public Utility Commission to establish tariffs and rules to further encourage investor-owned utilities to invest in renewable energy beyond what is provided by utilities through the public purpose charge.

House Bill 3488 also includes a provision related to House Bill 2210, the biofuels bill. It provides the Governor with the direct authority to suspend the renewable fuel standard for ethanol in the event of the unavailability of ethanol fuel under certain conditions. The Department of Energy must make findings verifying the unavailability of ethanol before the Governor can suspend the standard.

House Bill 3543: -- Global Warming Actions.

House Bill 3543 takes a number of actions to reduce global warming emissions. The bill codifies Governor Kulongoski's greenhouse gas reduction goals: namely by 2010 to begin to reduce greenhouse gas emissions, by 2020 to achieve greenhouse gas levels 10% less than 1990 levels and by 2050 to achieve greenhouse gas levels 75% below 1990 levels.

The bill also establishes a Global Warming Commission. The Commission is responsible for recommendations to meet the greenhouse gas reduction targets. The Commission is also responsible for examining cap and trade systems, for developing an educational strategy on global warming issues, for tracking global warming impacts on Oregon and other issues. The bill also creates the Oregon Climate Research Institute in the Oregon University System.

House Bill 5005 -- Bond Limitation Bill.

HB 5005 provides authorization for state agencies to issue state bonds for various purposes. The bill authorizes \$150 million for the Energy Loan Program to issue low-interest loans for renewable energy and energy efficiency. This is an increase of \$25 million over the previous biennium. This will allow the Energy Loan Program to make more loans for renewable energy projects and will also allow over \$35 million in new loans for university and community college energy-savings projects.

House Joint Memorial 22:-- Wave Energy

This memorial recognizes the great potential that Oregon has for wave energy. The memorial also expresses the strong support of the Oregon Legislature for the development of wave energy as a renewable energy resource with great potential to reduce dependence on oil and other fossil fuels. The memorial further express concern to Congress about the disagreement among federal agencies as to who has lead federal authority. The memorial urges Congress to resolve that issue and direct establishment of a review process specific to wave energy.

House Resolution I – Hydrogen Resolution.

House Resolution I supports development of renewable energy sources of hydrogen and recommends that hydrogen be a top priority of current and future renewable energy research, policy and programmatic initiatives by the State of Oregon. The resolution also encourages private - public partnerships like the Northwest Hydrogen Alliance.

Appendix B

Oregon Department of Energy Renewable Energy Resources

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Wetherbee, Jenifer	Administrative Specialist	503-378-5049	jenifer.wetherbee@state.or.us

Appendix C

Oregon Economic & Community Development Department

Current Rural Renewable Energy Development Zones

	<u>Effective Date</u>	<u>Director's Order</u>	<u>Authorized Exemptible Value*</u>	
			<u>Originally</u>	<u>Lately</u>
Union County	September 6, 2005	DO-05-132	\$100,000,000	\$100,000,000
Harney County	May 15, 2006	DO-06-149	\$100,000,000	\$100,000,000
Wasco County	June 22, 2006	DO-06-151	\$100,000,000	\$100,000,000
Sherman County	August 29, 2006	DO-06-159	\$50,000,000	\$50,000,000
Malheur County	August 31, 2006	DO-06-160	\$100,000,000	\$100,000,000
Polk County**	January 18, 2008	DO-08-178	\$100,000,000	\$100,000,000
Linn County**	April 7, 2008	DO-08-179	\$250,000,000	\$250,000,000
Crook County	April 29, 2008	DO-08-183	\$250,000,000	\$250,000,000

*In terms of initial real market value (RMV) of project property on January 1 of the first full year of service.

**Excluding metropolitan/large city urban growth areas.

Appendix D

OECD Business Development Officers

<u>Counties Served</u>	<u>Officer</u>	<u>Phone</u>	<u>Email</u>
Baker, Grant, Harney, Malheur and Morrow	Rick Minster	541-575-1050	rick.minster@state.or.us
Benton, Lane, Lincoln and Linn	Bob Warren	541-242-2380	bob.d.warren@state.or.us
Clackamas and Washington	John Racowitz	503-353-4411	john.racowitz@state.or.us
Clatsop, Columbia and Tillamook	Dennie Houle	503-229-5117	dennie.houle@state.or.us
Coos, Curry and Douglas	Chris Claflin	541-267-4651	chris.claflin@state.or.us
Crook, Deschutes and Jefferson	Clark Jackson	541-388-6266	clark.jackson@state.or.us
Gilliam, Hood River, Sherman, Wasco and Wheeler	Carolyn Meece	541-298-4140	carolyn.meece@state.or.us
Jackson, Josephine, Klamath and Lake	Larry Holzgang	541-882-1340	larry.holzgang@state.or.us
Marion, Polk and Yamhill	Tom Fox	503-485-9806	tom.j.fox@state.or.us
Multnomah	Sarah Garrison	503-229-5115	sarah.e.garrison@state.or.us
Statewide	Bruce Laird	541-944-2920	bruce.a.laird@state.or.us
Umatilla, Union and Wallowa	Jill Miles	541-963-8676	jill.a.miles@state.or.us

Appendix E

United States Department of Agriculture Rural Development

Oregon State Office

USDA RD Oregon State Office
1201 NE Lloyd Blvd, Suite 801
Portland, OR 97232-1274
Phone: (503) 414-3300, TTY (all branches): (503) 414-3387

Redmond Area Office

USDA RD Redmond Area Office
625 SE Salmon Ave
Redmond, OR 97756-8695
Phone: (541) 923-4358

Pendleton Area Office

USDA RD Pendleton Area Office
200 SE Hailey Ave., Suite 105
Pendleton, OR 97801-4143
Phone: (541) 278-8049

La Grande Satellite Office

USDA RD La Grande Satellite Office
1901 Adams Avenue, Suite 1
La Grande, OR 97850
Phone: (541) 963-4178

Roseburg Area Office

USDA RD Roseburg Area Office
2440 NW Troost Street #200
Roseburg, OR 97470
Phone: (541) 673-6071

Medford Satellite Office

USDA RD Medford Satellite Office
Parsons Drive, Suite 103
Medford, OR 97501-3769
Phone: (541) 776-4267 573

Corvallis Area Office

USDA RD Corvallis Area Office
4077 SW Research Way
Corvallis, OR 97333
Phone: (541) 750-7033

Appendix F

Regional Workforce Investment Boards

Region	Chair	Vice Chair	Staff
1: Columbia, Clatsop, Tillamook	Sheila Semling (Acting) Semlings Pharmacy 1804 Columbia Blvd. St. Helens, OR 97051 503-397-5555 sheila@opusnet.com	Jack McClave TaxPro PO Box 698 Rockaway Beach, OR 97136 503-355-3411 taxpro@oregoncoast.com	Lori Bell MTC Works 450 Marine Drive Suite 140 Astoria, OR 97103 503-325-1156 Lori.Bell@mtctrains.com
2: Multnomah, Washington	James Paulson The Standard 1100 SW 6 th Ave. Portland, OR 97204 971-321-8166 jpaulson@standard.com	Donald W. Jensen Bridgetown Coffee 3460 NW Industrial Portland, OR 97210 503-224-3330 donj@bridgetowncoffee.com	Andrew McGough Worksystems Inc. 111 SW 5 th Ave, #1150 Portland, OR 97204 503-478-7300 amcgough@worksystems.org
3: Marion, Polk, Yamhill	Michael Blanchard Johnson, Glaze & Co. 3085 River Road N. Salem, OR 97303 503-390-7880 michael@johnsonglaze.com	Patricia Callihan-Bowman 3340 Commercial St SE #110 Salem, OR 97301 503-399-1200 patricia.callihan-bowman@expresspersonnel.com Belinda Kovach 369 NW Hillcrest Lane Dallas, OR 97338 503-917-7997 stallbj@aol.com	Agnes Balassa Enterprise for Employment 250 Church Street SE #101 Salem, OR 97301 abalassa@workforce-solutions.net
4: Linn, Benton, Lincoln	John Martin Cascade Earth Services 3511 Pacific Blvd SW Albany, OR 97321 541-812-6614 john.martin@cascade-earth.com	Carolyn Gardner ViewPlus Technologies 1853 SW Airport Ave. Corvallis, OR 97333 541-754-4002 carolyn.gardner@viewplus.com	Steve Bekofsky Linn, Benton Lincoln WIB 545 SW Second, Suite A Corvallis, OR 97333 541-758-2605 sbekofsky@csc.gen.or.us

5: Lane	Bobby Lee Hynix Semiconductor 1830 Willow Creek Circle Eugene, OR 97402 541-338-5539 bobbyl@hynixeugene.com	Rosemary Pryor Oregon Community Credit Union 2880 Chad Drive Eugene, OR 97408 541-681-6009 rpryor@oregoncommunitycu.org	Chuck Forster Lane Workforce Partnership 300 Country Club Rd, Suite 120 Eugene, OR 97401 541-682-3800 chuck.forster@co.lane.or.us
6: Douglas	Willis Cook Express Personnel Services 3001 NW Stewart Pkwy #102 Roseburg, OR 97470 541-673-3332 willis.cook@expresspersonnel.com	Bob Craft SMOTIS, Inc. PO Box 2274 Roseburg, OR 97470 541-680-7938 bcraft@smotis.com	Joy Yori Chamber of Commerce WIB PO Box 1026 Roseburg, OR 97470 541-672-2648 workforcemgr@roseburgareachamber.org
7: Coos, Curry	Larry Blount 46968 Highway 101 Langlois, OR 97450 541-348-2267 lsblount@peoplepc.com	Mary Taylor Freeman Marine 28336 Hunter Creek Rd Gold Beach, OR 97444 541-247-7078 mary@freemanmarine.com	Tere Tronson North Curry Family Center PO Box 1145 Port Orford, OR 97465 541-332-1042 tronsont@co.curry.or.us
8: Jackson, Josephine	Lee Lanphier Lanphier Associates 3559 National Drive, Suite 102 Medford, OR 97504 541-773-8011 llanphier@lanphier.com	Tamara Nordin Rogue Valley Manor 1200 Mira Mar Medford, OR 97504 541-857-7620 tamara@retirement.org	Dennis Alexander The Job Council 673 Market Street Medford, OR 97504 541-776-5100, x2145 dennisa@jobcouncil.org
9: Hood River, Gilliam, Wasco, Wheeler, Sherman	Randy Scruggs, Acting Chair (see Vice Chair)	Randy Scruggs Mid-Columbia Medical Center 1700 E. 19 th The Dalles, OR 97058 541-296-1111, x 7542 randysc@mcmc.net	Robin Cope Region 9 WIB c/o Mid Columbia Council of Govts. 1113 Kelly Avenue The Dalles, OR 97058 541-296-8080 robinc@gorge.net

10: Deschutes, Crook, Jefferson	Robin Popp Goodwill Industries 61315 S. Hwy 97 Bend, OR 97702 541-322-7222 rpopp@guicw.org	Wendy Schechter Central Oregon Partnership 521 SW 6 th Redmond, OR 97756 541-504-3189 wendy.schechter@copartnership.org	Andrew Spreadborough Central Oregon Intergovernmental Council 2363 SW Glacier Place Redmond, OR 97756 541-504-3306 aspreadborough@coic.org
11: Klamath, Lake	Tara Prichard Double K Kleaning Service 13750 Spring Lake Road Klamath Falls, OR 97603 541-884-2879 doublek@fireserve.net	Dane Strausz Lumberman's 1303 N. 4 th Lakeview, OR 97630 541-947-4071 dstrausz@yahoo.com	Elisha Schilling (Temporary) Region 11 WIB 260 SW Ferry, Suite 202 Albany, OR 97321 541-928-0241, x 210 elisha@tocowa.org
12: Morrow, Umatilla	Neal Simpson Round-Up Athletic Club 1415 Southgate Pendleton, OR 97801 541-276-0880 nasimpson@uci.net	Bob Schroth The Simmons Agency 702 E. Main Hermiston, OR 97838 541-567-6367 bschroth@simmons-financial.com	Tara Bishop Community Action Program of East Central Oregon 721 SE 3 rd , Suite D Pendleton, OR 97801 541-278-5675 tbishop@capeco-works.org
13: Union, Wallowa, Baker	Bob Keyser Wallowa Mountain Properties 309 S. River, Suite D Enterprise, OR 97828 541-426-3026 bob@wallowacounty.com	Craig Thompson Union County Economic Development Corporation PO Box 1208 La Grande, OR 97850 541-963-0926 ucedc2@eoni.com	Tara Bishop Community Action Program of East Central Oregon 721 SE 3 rd , Suite D Pendleton, OR 97801 541-278-5675 tbishop@capeco-works.org
14: Grant, Harney, Malheur	John R. Hall NW Farm Credit Services 378 W. Idaho Ave. Ontario, OR 97914 541-823-2660 hallhome@cableone.net	Vacant	Mary Stewart Region 14 WIB PO Box 40 Canyon City, OR 97820 mary.k.stewart@state.or.us

15: Clackamas	Kathy Richardson Willamette Falls Hospital 9775 SE Sunnyside Rd, #100 Clackamas, OR 97045 kathy.richardson@wfhonline.org	Janice Chandler PCC Structurals, Inc. 13350 SW Johnson Road Milwaukie, OR 97222 503-353-1084 jchandler@pccstructurals.com	Terri Houde Workforce Inv. Council of Clackamas County Clackamas Community College 19600 Molalla Ave. Oregon City, OR 97045 503-657-6958, x5271 terrih@clackamas.edu
The Oregon Workforce Alliance (Regions 1, 6-7, 9-14)	Bob Schroth Simmons Financial Group PO Box 808 Hermiston, OR 97838 541-567-6367 bschroth@simmons-financial.com	Craig Schmidt Hood River County Chamber of Commerce 405 Portway Avenue Hood River, OR 97031 541-386-2000 cschmidt@hoodriver.com	Kris Latimer Oregon Workforce Alliance 260 SW Ferry, Suite 202 Albany, OR 97321 541-928-0241, x214 kris@tocowa.org

For assistance to the Workforce Alliance, contact:

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