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Oregon's Energy Efficiency and Renewable Energy Workforce

The Issue – What Jobs and Skills Are Involved?

Rising energy prices – and the prospect of continued high prices – have increased public focus on energy efficiency and renewable energy production. Many people believe Oregon could expand its energy efficiency and renewable energy production efforts. This expansion should provide jobs but would also require workers with specialized skills. What are those jobs and skills?

The Analysis – Many Jobs are in Common Occupations

A 2007 report by the American Solar Energy Society titled “Renewable Energy and Energy Efficiency” estimated that almost 3.7 million jobs were directly supported by the renewable energy and energy efficiency industries in the U.S. in 2006. Oregon's pro-rata share of this total would be about 47,000 jobs. The report stated, “The vast majority of the jobs created by RE [renewable energy] are standard jobs for accountants, engineers, computer analysts, clerks, factory workers, truck drivers, mechanics, etc.” A table in the report showed the number of jobs generated in 36 occupations in the U.S. in 2006 by the renewable energy industry. None of these occupations were unique to the renewable energy industry, but at least some and perhaps many of them require additional knowledge and skills that are unique to that industry.

Certifications Help Identify Skills Needed

Although most occupations directly supported by the energy efficiency and renewable energy industries are common to many other industries as well, some skill certifications are unique to the energy efficiency and renewable energy industries. These certifications may help us identify some of the skills that are essential to these industries.

The Oregon Department of Energy's Web page notes that “Anyone interested in offering solar energy sales, installation or professional services should obtain ... training ... and must obtain the necessary licenses to legally do work in Oregon.” Typical licenses include a business license, contractor licenses (general, electrical, or plumbing), and installer licenses (electrical journeyman, limited renewable technician, plumbing journeyman, or solar thermal license).

The Oregon Department of Energy (ODOE) provides a list of 40 companies that employ one or more tax-credit certified solar technicians and that can assist Oregon taxpayers in obtaining a Residential Energy Tax Credit on their solar energy installation. A tax-credit certified solar technician is someone who has passed a technology-specific

competency exam and attended training on the ODOE tax-credit program. Approved exams include the "limited renewable technician" license exam, the "solar thermal license" exam, the ODOE exam, and full or entry-level certification by the North American Board of Certified Energy Practitioners (NABCEP) As of March 14, 2008, NABCEP listed 10 certified photovoltaic installers and one certified solar thermal installer in Oregon. To maintain ODOE certification requires at least two hours of continuing education and installation and verification of at least two systems per year, in addition to signing an annual agreement and attending an annual conference call update.

Another application of energy efficiency technology is practiced by a "green building inspector," a building inspector with a certificate in "green building technologies" and codes needed to meet the U.S. Green Building Council's "Leadership in Energy and Environmental Design" (LEED) standards.

Some Training is Already Available in Oregon or Nearby

A March 2008 report titled "An Analysis of Clean Energy Workforce Needs and Programs in Oregon" identified 28 clean energy workforce training programs in the state. These were offered through Oregon academic institutions, a non-profit organization, and numerous apprenticeship programs. The following are a few examples of Oregon's existing training.

Lane Community College's Northwest Energy Education Institute offers two Associate of Applied Science (AAS) two-year degree programs: an energy management technician program and a renewable energy technician program. These programs combine the principles of basic physics with energy analysis techniques. Graduates of the energy management technician program will be able to:

- Evaluate the energy use patterns for residential and commercial buildings and recommend energy efficiency and alternative energy solutions for high-energy consuming buildings.

- Understand the interaction between energy consuming building systems and make recommendations based on that understanding.

- Construct energy evaluation technical reports and make presentations for potential project implementation.

Graduates of the renewable energy technician option also will be able to:

- Appropriately size and recommend renewable energy system types for particular situations.

- Understand and put into practice the installation protocol for photovoltaic and solar domestic hot water systems.

Columbia Gorge Community College offers a one-year certificate and an Associate of Applied Science degree in its renewable energy technology program that prepares students for employment in a broad range of industries, including hydroelectric power generation and wind-power generation.

In addition, there are other renewable energy and energy efficiency training resources in Oregon or nearby locations. Energy Trust of Oregon offers training classes for contractors; trainings include an explanation of Energy Trust's solar incentive programs as well as installation standards training for solar electric and/or solar water heating systems. The Oregon Solar Energy Industries Association offers installer training opportunities. The International Brotherhood of Electrical Workers offers solar electric installation training which is open to the public. Solar Energy International offers training courses and seminars on both solar electric and solar water heating in various locations around the country on a regular basis. The Renewable Energy Joint Apprenticeship Training Committee offers several apprenticeship programs for the installation of solar electric and thermal systems.

Oregon Has Many Companies Potentially Involved in Energy Services and Equipment

The training mentioned above seems to focus mostly on installing existing manufactured renewable energy or energy efficiency equipment rather than on designing and manufacturing such equipment. Oregon already has some companies that produce goods and services directly related to energy efficiency or renewable energy. Many other companies probably produce similar products or services and may be able to expand into the energy efficiency or renewable energy markets. However, it is difficult to identify these companies because North American Industry Classification (NAICS) codes do not differentiate between "green" goods and services and "non-green" ones. It is rare that a given NAICS code is "green" by virtue of the types of businesses covered by the code. However, some NAICS industries are likely to contain companies either currently serving or readily able to serve the energy efficiency or renewable energy markets. Two of our staff – Jon Wilson and Stacie Read – identified the industries that are likely or potentially able to contain some "green" activities. The sectors are listed below with their total numbers of companies and employees covered by unemployment insurance in 2006.

I – organic agriculture and biomass production

111 – Crop Production (1,495 companies, 27,234 employees)

113 – Forestry and Logging (893 companies, 7,628 employees)

Organic crop production is likely to consume less non-renewable energy due to lower inputs of fertilizers and pesticides made from fossil fuels. Forestry and logging are likely to be involved in cellulose-based biofuel production and in biomass energy production.

II - energy efficient building, construction and retrofit industries

236115 - New Single-Family Residential Construction (3,227 companies, 10,609 employees)

236116 - New Multifamily Housing Construction (43 companies, 640 employees)

236117 - New Housing Operative Builders (43 companies, 137 employees)

236118 - Residential Remodelers (1,205 companies, 4,214 employees)

236210 - Industrial Building Construction (68 companies, 1,444 employees)

236220 - Commercial and Institutional Building Construction (683 companies, 7,927 employees)

Many specialty trades contractors (coded in Subsector 238) could be included in this category. Some heavy and civil engineering construction contractors (coded in Subsector 237) could also be included.

III - renewable electric power industry

221111 - Hydroelectric Power Generation (data confidential)

221119 - Other Electric Power Generation (e.g., wind, solar) (5 companies, 39 employees)

562213 - Solid Waste Combustors and Incinerators – this code covers “co-generation facilities” that produce electricity from the heat created during the incineration process. (4 companies, 129 employees)

IV - energy efficient and advanced drive train vehicle industry

336312 - Gasoline Engine and Engine Parts Manufacturing (6 companies, 61 employees)

336350 - Motor Vehicle Transmission and Power Train Parts Manufacturing (data confidential)

333618 - Other Engine Equipment Manufacturing (4 companies, 76 employees)

335312 - Motor and Generator Manufacturing – this covers electric motors (data confidential)

V - biofuels industry

324110 - Petroleum Refineries (data confidential)

324199 - All Other Petroleum and Coal Products Manufacturing (no companies)

325193 - Ethyl Alcohol Manufacturing (data confidential)

325998 - All Other Miscellaneous Chemical Product and Preparation Manufacturing (11 companies, 82 employees)

Of these four industries, all but NAICS 325193 are listed here based on information provided by the Bureau of Labor Statistics National Office which, in turn, is based on an opinion from the Census Bureau. NAICS 325193 is included because biofuel can include a mixture of 80 percent petroleum product and 20 percent additive all the way to virtually 100 percent nonpotable ethyl alcohol.

VI - deconstruction and material use industries

423930 - Recyclable Material Merchant Wholesalers (116 companies, 1,662 employees)

562920 - Materials Recovery Facilities (4 companies, 120 employees)

VII - energy assessment industry serving the residential, commercial or industrial sectors

541350 - Building Inspection Services (111 companies, 198 employees)

541690 - Other Scientific and Technical Consulting Services – which includes energy consulting services. (397 companies, 1,047 employees)

VIII - manufacturers that produce sustainable products using environmentally sustainable processes and materials

It is difficult to guess what types of establishments, hence industries, could be included in this category. In some cases, the product may be “green” but the manufacturing process may not. For example, the manufacture of solar panels can be considered the manufacture of a “green” product, but the manufacturing of it is not a “green” process. Probably all electronic and electrical products are more energy efficient than they were 20 years ago due to the use of more energy efficient materials, but the manufacturing process remains largely unchanged except for increases in automation.

Conclusion

High energy prices point to job opportunities in the energy efficiency and renewable energy industries. People in Oregon already have some access to training programs designed to provide some of the skills needed to succeed in those jobs. In addition, Oregon has many companies and many employees in industries that hold potential for participating in the emerging markets for energy efficiency and renewable energy goods and services.

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