



# EPA's State Climate and Energy Technical Forum

## *Clean Energy Workforce Development: Growing Green Jobs to Achieve Climate and Energy Goals*

February 24, 2009

Clean energy workforce development programs are becoming more important at both state and local levels. Appropriately trained employees will be needed to transition to a cleaner economy that will help address climate change and energy challenges while creating new jobs. Many of these jobs will require little additional training beyond applying traditional skills to new fields.<sup>1</sup> However, other jobs do require training or advanced degrees. This paper explores the definitions of green jobs and clean energy workforce development. It also details elements of effective programs and describes what some states are doing to promote clean energy workforce development. Attachment II includes an extensive resource list for states pursuing clean energy workforce development. Download this paper and accompanying materials at [www.epa.gov/cleanenergy/energy-programs/state-and-local/state-forum.html](http://www.epa.gov/cleanenergy/energy-programs/state-and-local/state-forum.html).

### What Are Green Jobs? What are Clean Energy Jobs?

There is no commonly shared definition of “**green jobs**.” In fact, one U.S. Department of Labor (U.S. DOL) effort to catalog green jobs definitions produced more than one dozen different options from reputable sources.<sup>2</sup> To date, each state that has developed priorities related to green jobs has created its own definition. However, the Obama Administration has published the following definition in the context of the Vice President’s Middle Class Task Force:

*“Green jobs are jobs that provide products and services which use renewable energy resources, reduce pollution, conserve energy and natural resources and reconstitute waste.”<sup>3</sup>*

**Clean energy jobs** are a subset of green jobs—those related to energy efficiency, renewable energy, and clean combined heat and power (CHP). One fairly comprehensive definition of clean energy jobs is provided by the American Solar Energy Society (ASES):<sup>4</sup>

“A job in the renewable energy (RE) industry consists of an employee working in one of the major RE technologies—wind, photovoltaics, solar thermal, hydroelectric power, geothermal, biomass (ethanol, biodiesel, and biomass power), and fuel cells and hydrogen. A job in the energy efficiency (EE) industry consists of an employee working in a sector that is entirely part of the EE industry, such as an energy service company (ESCO) or the recycling, reuse, and remanufacturing sector. It also includes some employees in industries in which only a portion of the output is classified as within the EE sector, such as household appliances, HVAC systems, construction, automobile manufacturing, and others. Jobs in RE & EE [can] include persons involved in RE & EE activities in federal, state, and local government, universities, nonprofits, trade and professional associations, non-governmental organizations (NGOs), foundations, consultancies, investment companies (e.g., analysts), and other related organizations.”

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<sup>1</sup> [www.ases.org/greenjobs](http://www.ases.org/greenjobs)

<sup>2</sup> E-mail from Charles Cox, ETA-DOL to Danielle Byrnett, EPA et al. on January 27, 2009 re: Greening the Workforce Meeting Follow-up

<sup>3</sup> [http://www.whitehouse.gov/blog\\_post/save\\_the\\_date\\_1/](http://www.whitehouse.gov/blog_post/save_the_date_1/)

<sup>4</sup> [http://www.ases.org/images/stories/ASES/pdfs/CO\\_Jobs\\_Rpt\\_Jan2009\\_summary.pdf](http://www.ases.org/images/stories/ASES/pdfs/CO_Jobs_Rpt_Jan2009_summary.pdf)

ASES released its *Green Collar Jobs Report* in 2009—a study that attempted to comprehensively study the size and scope of the renewable energy (RE) and energy efficiency (EE) industries and their potential for growth.<sup>5</sup> The study by showed that for the RE and EE industries, specific jobs that could be expected to grow include:

- electricians
- mechanical engineers
- welders
- metal workers
- construction managers
- accountants
- analysts
- environmental scientists
- chemists

ASES determined that the vast majority of jobs created by the renewable energy and energy efficiency industries are in the same types of roles seen in other industries (accountants, factory workers, information technology professionals, etc.) that will be applied to “green” industries in the new economy. Nonetheless, utilities, state energy offices, and others are already experiencing shortages in energy auditors, home weatherization technicians, energy efficiency program design professionals, and other skilled jobs.<sup>6</sup> Similarly, the GHG Management Institute released its 2009 Greenhouse Gas & Climate Change Workforce Needs Assessment Survey Report, which identified a shortage of qualified greenhouse gas accountants, verifiers, and managers.<sup>7</sup>

One of the promises of clean energy jobs is that many of them are not subject to foreign outsourcing. If a homeowner needs an energy audit, subsequent weatherization and efficient equipment installations, and solar photovoltaic panels installed on his/her house, all of those activities will necessarily be performed by workers at the homeowner’s location. Additionally, many clean energy jobs are in two categories that every state is eager to attract—college-educated professional workers (many with advanced degrees), and highly skilled technical workers.

### ***Limitations in Estimating Green Jobs***

It is difficult to estimate the number of existing and potential green jobs in a state because many job types are shared across traditional and green industries, and are not categorized differently in labor statistics. There are no specific “green job” categories tracked by the U.S. DOL because most occupations already exist. To address this issue when conducting an assessment in Connecticut, the Connecticut Department of Labor used Standard Occupational Classification (SOC) definitions to estimate and project the number of “green” occupations in the state, but emphasized that such an approach significantly understates the amount of “green” employment in Connecticut, or any state.<sup>8</sup>

Note: On January 21, 2009, the Office of Management and Budget (OMB) published a Federal Register notice detailing the final decisions for the 2010 Standard Occupational Classification (SOC). **Solar Photovoltaic Installers** and **Wind Turbine Service Technicians** are now stand-alone occupations. See: <http://www.bls.gov/soc/soc2010final.pdf>

ASES took a sweeping approach within the confines of analyzing renewable energy and energy efficiency jobs. In addition to estimating all jobs within strictly RE and EE industries, they also counted the proportion of a job which met its definition of a green job. ASES estimated that the RE and EE industries provided more than 9 million jobs and \$1,045 billion in revenue in the U.S. in 2007.<sup>9</sup> Evaluating three

<sup>5</sup> [http://www.ases.org/images/stories/ASES/pdfs/CO\\_Jobs\\_Rpt\\_Jan2009\\_summary.pdf](http://www.ases.org/images/stories/ASES/pdfs/CO_Jobs_Rpt_Jan2009_summary.pdf)

<sup>6</sup> Correspondence with EPA through the Climate and Energy State Programs and the National Action Plan for Energy Efficiency.

<sup>7</sup> GHG Management Institute and Sequence. 2009 Greenhouse Gas & Climate Change Workforce Needs Assessment Survey Report, <http://www.ghginstitute.org/downloadables/Reports/2009survey.pdf>

<sup>8</sup> <http://www.ctdol.state.ct.us/lmi/misc/ceddec08.pdf>

<sup>9</sup> [http://www.ases.org/images/stories/ASES/pdfs/CO\\_Jobs\\_Rpt\\_Jan2009\\_summary.pdf](http://www.ases.org/images/stories/ASES/pdfs/CO_Jobs_Rpt_Jan2009_summary.pdf)

scenarios, ASES also estimated that the RE & EE industries will contribute to more than 16 million jobs and \$1,966 billion in revenue in the U.S. by 2030 with no new policy interventions or up to about 37 million jobs and \$4,294 billion in annual revenue by 2030 with aggressive technological and economic investments.

## What is Clean Energy Workforce Development?

Clean energy workforce development is the preparation of an able workforce to be employed at green jobs within the clean energy sector—energy efficiency, renewable energy, and clean CHP.

**Workforce development** is the general term used to describe activities and services designed to increase individuals' employment and earning potential, such as job-search and placement assistance, career counseling, training and other job preparation activities. Workforce development also is sometimes called workforce investment or employment services.<sup>10</sup>

Clean energy workforce development focuses on ensuring enough professionals are available and well-trained to deliver on state, regional, and federal climate and energy goals by running weatherization programs, designing energy efficiency program implementation, installing renewable energy and CHP systems, and manufacturing clean energy products to name a few.

Although few studies have comprehensively attempted to identify the **gaps between current workforce capabilities and clean energy jobs** on a supra-state scale, one literature review in 2006 by the National Renewable Energy Laboratory did identify the top 10 most frequently identified nontechnical barriers to solar energy and other energy efficiency and renewable energy technologies.<sup>11</sup> These included:

- Lack of government policy supporting EE/RE
- Lack of information dissemination and consumer awareness about energy and EE/RE
- High cost of solar and other EE/RE technologies compared with conventional energy
- Difficulty overcoming established energy systems
- Inadequate financing options for EE/RE projects
- Failure to account for all costs and benefits of energy choices
- ***Inadequate workforce skills and training***
- Lack of adequate codes, standards, and interconnection and net-metering guidelines
- Poor perception by public of renewable energy system aesthetics
- Lack of stakeholder/community participation in energy choices and EE/RE projects

## What Does Effective Clean Energy Workforce Development Entail?

Clean energy workforce development requires some degree of overcoming the classic chicken-egg problem of “Which comes first?” For example, policies and programs need to be in place to facilitate the development of a market for clean energy products and services so businesses will grow and hire workers. However, at the same time, businesses will not locate someplace where there is not already a skilled worker base to meet their needs.

For this reason, clean energy workforce development requires partnerships between policymakers, business, and labor—but also across state and local agencies and departments (e.g., energy, environmental, labor), along with educators (e.g., universities, community colleges, technical high schools, and certification programs).

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<sup>10</sup> U.S. Department of Labor, Office of the Assistant Secretary for Policy, [http://www.dol.gov/asp/programs/drugs/workingpartners/dfworkforce/dfwf\\_wfd.asp](http://www.dol.gov/asp/programs/drugs/workingpartners/dfworkforce/dfwf_wfd.asp)

<sup>11</sup> <http://www.nrel.gov/docs/fy07osti/40116.pdf>

States and non-governmental organizations that have analyzed and evaluated the potential for clean energy jobs and successful workforce development have learned some key lessons about developing an effective clean energy workforce development strategy.

These basic guidelines include:

1. **Clean energy policies are needed to develop/expand the market for businesses and therefore jobs.**
  - a. Continue to develop renewable energy and energy efficiency policies that will expand the use of clean energy services as well as products, otherwise new businesses and employees will not be needed (see box at right). Examples include: Home Performance with ENERGY STAR (see box below), energy benchmarking requirements for buildings (e.g., in California, in the District of Columbia), and quality installation requirements (see box page 6).
  
2. **Current and future projections of business and labor market status in the target market(s) are needed to identify gaps.** (Start where you are: What's the demand now and in the future?)
  - a. Leverage labor market data to understand what you have. The U.S. DOL and state labor departments track statistics related to industry and labor market (see [www.doleta.gov/programs/sources.cfm](http://www.doleta.gov/programs/sources.cfm)). U.S. DOL also has competency models (industry-verified knowledge, skills, and experience) for various sectors/skills needed by occupation (see <http://www.careeronestop.org/competencymodel/>).
  - b. Convene industry (business and labor) meetings to

**Promoting Products and Services to Encourage Jobs**

The **New Jersey Clean Energy Program** has offered rebates for high efficiency furnaces, heat pumps, and air conditioners to residents. Now, New Jersey also works with a local organization (Eastern Heating and Cooling Council) that offers training for HVAC contractors on proper installation of high efficiency equipment that can be purchased with the rebates.

Others can implement similar initiatives through the new ENERGY STAR HVAC Quality Installation program, which uses the ACCA/ANSI HVAC Quality Installation Specification. Utilities that implement the program offer training to participating contractors on all the requirements of the specification to promote effective energy savings.

This type of program offers a win-win-win: consumer discounts for energy efficient equipment, proper installation to result in real energy savings in the state, and training/green jobs for contractors.

**One Starting Point for Energy Savings and Worker Training: Home Performance with ENERGY STAR**

Home Performance with ENERGY STAR (HPwES), a program from the U.S. Environmental Protection Agency (EPA) and U.S. Department of Energy (DOE), is a good example of how to address the “which comes first” (workforce or demand) problem. The program is designed to raise awareness and increase demand for comprehensive energy improvements in existing homes, but also includes components to develop an infrastructure of qualified professionals to meet that demand.

**Austin Energy (Texas)**, an ENERGY STAR partner, has been providing training and has developed a network of over 87 qualified home performance contractors. Austin Energy has offered discounted training; cooperative advertising; public recognition awards; and monthly meetings to discuss program improvements, new technologies, and strategies for resolving problems. Austin Energy has also started to encourage professional technician certification by the Building Performance Institute (BPI; see page 8).

The **New York State Energy Research and Development Authority (NYSERDA)**, an ENERGY STAR partner, has offered financial assistance to new contractors that participate in HPwES to help them purchase diagnostic equipment (e.g., blower doors, infrared cameras) and become accredited through BPI. Each of these actions has helped NYSERDA increase the number of qualified contractors who can deliver whole-house energy improvements to 150.

identify specific skill gaps in your region and for your employment base (i.e., skill panels).

- c. Look at examples of states that have completed market and jobs analyses (see box; more examples on page 9).

3. **Partnerships across workforce development entities are critical to the development of successful and sustainable tactics and approaches for closing the gaps.**

- a. Plan to use/leverage potential partners that already exist in the region. Some examples include: departments of labor, workforce investment boards, industry associations, chambers of commerce, local unions, green jobs-related NGOs (Green for All, Apollo Alliance), public housing authorities, prison systems, community-based organizations.
- b. Create sector-based collaboratives to identify what's needed, when, and by whom (e.g., high school, community college, on-the-job) to train workers for jobs in the region.
- c. Leverage existing state workforce investment boards, local workforce investment boards, and local one-stop career centers where numerous programs may already be in place that could incorporate a "green jobs" component or approach. See <http://www.doleta.gov/USWORKFORCE/>.

**Renewable Energy Policy to Enhance Minnesota's Green Jobs Growth**

In preparing Minnesota's Green Jobs Draft Action Plan, a market analysis was developed for Task Force consideration. The analysis focused on green economy opportunities in Minnesota based upon green jobs-related markets, industry strengths, innovation strengths, and the overall economic framework of the state. The analysis determined that Minnesota's focus on renewable energy from a policy and regulatory standpoint will enhance Minnesota's ability to grow and attract green jobs in that sector. Minnesota has begun to support the growth of green product markets, and the environmental conservation industry has made progress in recent years that is resulting in growth in the green services sector.

Source: Minnesota's Draft Action Plan, January 26, 2009, <http://www.mngreenjobs.com/>

## **Massachusetts' Solar Photovoltaic (PV) Program Creates Demand for New Businesses and Keeps Stringent Installation Requirements**

Massachusetts' Commonwealth's Solar Rebate Program completed its first year in January 2009. The Commonwealth Solar Rebate Program made 421 rebate awards, 186 of which were installed in 2008, representing 4.6 MW worth of solar PV in 2008. "This is a 25 percent increase in the number of projects installed compared to 2007 numbers," said Sam Nutter, Senior Project Manager for the Massachusetts Renewable Energy Trust.

"Of those 421 awards," said Nutter, "158 of them were residential, for 612 kW, and 28 were commercial installs for 527 kW; the largest of which was 108.6 kW. The average size of the residential installations was almost 4 kW. When these systems are installed, they will double the total amount of PV in the state from the levels that were in place at the end of 2007 when the program was launched."

The increase in installations means more work for the Commonwealth's installers. In fact, in 2008, the Commonwealth Solar Rebate Program saw **105 new installers or installation companies providing solar design and installation services in Massachusetts, up from some 28 firms at the same time last year**, many of which have added staff to handle the increase in customer demand. "This reflects a 125 percent increase in solar installers and integrators utilizing the Trust's funding programs from previous years," said Nutter.

With only 26 PV and 2 North American Board of Certified Energy Practitioner's (NABCEP)-certified installers in the state, the Trust is getting the work done by also relying on licensed contractors with licensed electricians following state codes.

Said Nutter, "We also have some rather stringent insurance requirements. We support NABCEP's certifying installers to a nationally-recognized standard of competencies. For our non-NABCEP-certified installers, our 'crawl-before-you-walk' requirement involves closer scrutiny on their first three projects, along with mandatory post-installation inspections by an independent NABCEP-certified inspector. We won't pay the rebate until they pass the inspection, nor will we approve the second application until they pass inspection. If they successfully demonstrate compliance with code and industry requirements after those first three installations, we will expedite future installations and only subject them to random inspections. New installers to our program who are NABCEP-certified are exempt from the 'crawl-before-you-walk' restrictions."

According to Nutter, the Trust is working with some of the newer firms; still, they all seem to be keeping up with the demand.

Source: Interstate Renewable Energy Council (IREC), January 26, 2009, [http://www.irecusa.org/index.php?id=68&tx\\_ttnews\[tt\\_news\]=1328&tx\\_ttnews\[backPid\]=123&cHash=26ef908412](http://www.irecusa.org/index.php?id=68&tx_ttnews[tt_news]=1328&tx_ttnews[backPid]=123&cHash=26ef908412)

## ***Who Delivers Workforce Training?***

The most efficient and effective way to prepare a clean energy workforce is to build on the existing foundation of state and local workforce development systems.<sup>12</sup> Traditional providers of workforce training include:

- Community Colleges
- Vocational/Technical High Schools
- Community-Based Organizations
- Labor Unions
- Trade Associations
- Four-Year Colleges and Universities

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<sup>12</sup> Center on Wisconsin Strategy, Greener Pathways, 2008, <http://www.cows.org/pdf/rp-greenerpathways.pdf>



These providers all have some combination of existing training, certification, and apprenticeship programs in place, which could be leveraged to provide targeted clean energy workforce training.

At least two major accreditation bodies offer accreditation to providers of training programs. Ensuring that a provider holds one of these accreditations or an equivalent can be useful in identifying high quality providers:

- **ANSI/ISO/IEC 17024 accreditation.** The International Organization of Standardization (ISO) and the International Electrotechnical Commission (IEC) have developed a global, voluntary benchmark for organizations responsible for certification of personnel. Fully enacted on April 1, 2003, this international standard (ANSI/ISO/IEC 17024) was designed to harmonize the personnel certification process worldwide and create a more cost-effective global standard for workers. This process involves both a review of a paper application and the performance of an audit (on-site visit) to validate information provided by each applicant. The use of an onsite audit for accreditation of personnel certification agencies is unique to ANSI. (See [http://www.ansi.org/conformity\\_assessment/personnel\\_certification/overview.aspx](http://www.ansi.org/conformity_assessment/personnel_certification/overview.aspx).)
- **Institute for Sustainable Power Quality (ISPQ) accreditation.** The Institute for Sustainable Power Quality accredits training deliverers. Providers that receive ISPQ accreditation have undergone a rigorous application and audit process, and their course content follows an industry task analysis. (See [www.ispqusa.org](http://www.ispqusa.org).)

#### **Best Practices in Green Jobs Training Course Development**

(from Jane Weissman, Interstate Renewable Energy Council [IREC])

1. Students should start with a skills assessment to identify baseline knowledge and weaknesses.
2. Curriculum must include some real-world preparation (i.e., hands-on time).
3. Prerequisites should be defined and identified for each course so students are being appropriately engaged at their level.
4. Student performance should be assessed (e.g., through quizzes, tests) to ensure absorption of material.
5. Alliances should be developed with business and industry to ensure curricula and training are tailored to the needs and skills required by employers.
6. Partners should be identified and leveraged for articulation of courses (e.g., vocational/technical high schools, community colleges, four-year colleges).

Source: “Workforce Training: Credentials, Pathways and Pipelines to the Green Economy,” Good Jobs, Green Jobs National Conference, Washington, DC. February 6, 2009.

**For more information, see:** Interstate Renewable Energy Council’s (IREC’s) Renewable Energy Training Best Practices & Recommended Guidelines,

[http://www.irecusa.org/fileadmin/user\\_upload/WorkforceDevelopmentDocs/Training-BestPractices\\_Sept\\_2008\\_FINAL.pdf](http://www.irecusa.org/fileadmin/user_upload/WorkforceDevelopmentDocs/Training-BestPractices_Sept_2008_FINAL.pdf)

### ***What Certifications Are Used?***

A small handful of energy efficiency and renewable energy certification bodies are operating across the United States that attempt to vouch for the knowledge and/or skills received by students who take training courses on these topics. However, there is no national entity that evaluates and “approves” the veracity of the certification standards that each organization sets to reach its standard—the marketplace is left to decide which certifications are most valuable. Following are certifications that at least some states require workers to hold before performing the relevant work:

- **Building Performance Institute (BPI).** Certifies weatherization auditors, energy efficiency installation personnel, and other professionals in the residential and multifamily building performance contracting industry. *“BPI contractors have completed rigorous training, administered by a network of affiliates, in home performance evaluation focused on the house-as-a-system concept. These systems include heating, ventilation, and air conditioning equipment and the building envelope or outer shell—the foundations, walls, roof, and all their component parts like windows and doors.”* See [www.bpi.org](http://www.bpi.org).
- **Residential Energy Services Network (RESNET®).** Certifies raters that evaluate buildings based on a relative energy use index called the HERS® Index. (A HERS Index of 100 represents the energy use of the “American Standard Building” and an index of zero indicates that the proposed building uses no net purchased energy—is a zero-energy building). A rater produces a set of recommendations for cost-effective improvements that can be achieved by the rated building. *“Training providers are accredited by RESNET through curricula approval and instructor certification. Rater candidates must pass a national online test. Rater candidates must perform 5 ratings under the supervision of a certified rater. The rater may then be certified by a RESNET accredited Rating Provider.”* See [www.natresnet.org](http://www.natresnet.org).
- **North American Board of Certified Energy Practitioners (NABCEP).** Offers national credentialing and certifications for renewable energy professionals—specifically, through certification programs for solar electric (photovoltaic [PV]) installers and solar thermal installers. *“NABCEP is the national certification organization for professional installers in the field of renewable energy. NABCEP issues voluntary certification credentials to those qualified professionals who satisfy eligibility requirements established by the Board of Directors. NABCEP certification is not a professional license issued by a government agency, and does not authorize a certificant to practice. NABCEP certificants must comply with all legal requirements related to practice, including licensing laws.”* See [www.nabcep.org](http://www.nabcep.org).

#### **Solar PV Train-the-Trainer Workshops**

One concern among workforce educators is a perceived shortage of qualified trainers to deliver clean energy workforce courses. In January 2009, the U.S. Department of Energy funded a PV workshop for solar energy educators in Southern California in conjunction with the Interstate Renewable Energy Council (IREC). A detailed description of the training, participants, challenges, and opportunities can be found at:

[http://www.irecusa.org/index.php?id=71&tx\\_ttnews\[tt\\_news\]=1352&tx\\_ttnews\[backPid\]=123&cHash=f42bb92474](http://www.irecusa.org/index.php?id=71&tx_ttnews[tt_news]=1352&tx_ttnews[backPid]=123&cHash=f42bb92474).

## **What are States Doing?**

States and municipalities have utilized varied strategies for developing clean energy workforce development programs. However, several common strategies exist, such as:

- Evaluating the current clean energy workforce in a state and conducting gap analyses to identify training programs and industry needs.
- Establishing dedicated “green collar” funds to finance worker training programs.
- Working with established universities, community colleges, and vocational/technical high schools to integrate clean energy workforce training curricula and programs.
- Tailoring programs for low-income workers.

Some examples of unique approaches to clean energy workforce development include:

- Awarding additional renewable energy certificates (RECs) to utilities with an apprenticeship program (e.g., Washington).



- Authorizing community colleges to issue bonds on behalf of businesses that create green jobs—with the money used to support training required for the new jobs and related program administrative expenses (e.g., Iowa New Jobs Training Program).
- Developing regional workforce response teams that can cater to unique conditions and energy opportunities within regions of a state (e.g., Oregon).

State clean energy workforce development programs are at varying stages of development. Table 1 summarizes programs reviewed for this document. Short descriptions of each program can be found in Attachment I.

**Table 1: Examples and Status of Selected State Clean Energy Workforce Development Programs**

<b>Examples of State Programs</b>	
<b>State</b>	<b>Program Name</b>
Iowa	Workforce Training and Economic Development Fund
	New Jobs Training Program
New York	Wind Energy Research and Testing Center
North Carolina	North Carolina Business Fund
Oregon	Sustainable Oregon Workforce Initiative
	Workforce Response Teams
Vermont	Vermont Sustainable Jobs Fund
Washington	Renewable Energy Apprenticeship
<b>States with Green Jobs Analyses / Action Plans</b>	
<b>State</b>	<b>Report Name</b>
<b>Minnesota</b>	<i>MN Green Jobs Task Force Draft Action Plan</i> (January 2009), <a href="http://www.mngreenjobs.com/">http://www.mngreenjobs.com/</a>
<b>New York</b>	<i>Working Group VII – Workforce Training and Development Scope, Task, and Schedule</i> (August 2008), <a href="http://www.dps.state.ny.us/07M0548_Working_groups_phase2.htm">http://www.dps.state.ny.us/07M0548_Working_groups_phase2.htm</a>
<b>Oregon</b>	<i>An Analysis of Clean Energy Workforce Needs and Programs in Oregon</i> (May 2008), <a href="http://www.worksourceoregon.org/index.php/component/docman/doc_details/734-analysis-of-clean-energy-workforce-needs-and-programs-in-oregon">http://www.worksourceoregon.org/index.php/component/docman/doc_details/734-analysis-of-clean-energy-workforce-needs-and-programs-in-oregon</a>
<b>Tennessee</b>	<i>Growing Green: The Potential for Green Job Growth in Tennessee</i> (November 2008), <a href="http://www.state.tn.us/labor-wfd/Publications/EmploymentSecurity/GrowingGreenInTN2008.pdf">http://www.state.tn.us/labor-wfd/Publications/EmploymentSecurity/GrowingGreenInTN2008.pdf</a>
<b>Washington State</b>	<i>2008 Washington State Green Economy Jobs</i> (February 2009), <a href="http://energy.wsu.edu/documents/Green_Jobs_Report_2008.pdf">http://energy.wsu.edu/documents/Green_Jobs_Report_2008.pdf</a>
<i>Massachusetts</i>	Report on clean energy sector of MA’s economy due in February 2009.
<i>Vermont</i>	Green business labor force analysis due in February 2009.
<b>Examples of Recent Legislation</b>	
<b>State</b>	<b>Legislation</b>
Colorado	Green Jobs Legislation (HB 1025), March 2008
Kentucky	Energy Technology Career Track Program (HB 2), April 2008
Maryland	Maryland Strategic Energy Investment Fund (HB 368), April 2008
Massachusetts	Green Jobs Act (HB 5018), September 2008
Michigan	Centers of Energy Excellence Program (SB 1380), July 2008
Ohio	Edison Technology Center Program (SB 221), May 2008
Vermont	Green Jobs Legislation (HB 885), June 2008
Washington	Green Job Legislation (SB 6516), January 2008

**Example Green Jobs Principles: Washington State’s Strategic Framework for a Green Economy (excerpts)**

**Aim high**

The state should set significant targets (energy efficiency, state procurement of green products, creating renewable energy, etc.) to demonstrate that there is a large and sustained market to pursue and that these markets are real. The state should make every effort to provide confidence in market sustainability through clear descriptions of needed change (goals, incentives, regulations).

**Don’t pick winners and losers**

Be technology-neutral. Do not mandate particular fuel types or certain environmental technologies. Design broad initiatives that focus on specific outcomes (carbon reductions, water quality or energy-efficiency standards). Let the market pick the winners. Build in flexibility and room for industries and institutions to make adjustments based on market conditions and new discoveries.

**Share prosperity**

Design policies and programs that will distribute economic benefits and provide living wages, career pathways, and small-business starts all across the state. Use strategies that balance the “Triple Bottom Line” of healthy environment, vibrant economy and social equity.

**Work with the highest returns first**

Work with the highest job-growth potentials first. Begin working immediately with the “low-hanging fruit” that are closest to market competitiveness. This will allow the state to achieve immediate employment and environmental gains, while advancing more difficult and long-term strategies for the green economy.

**Maintain solid foundation for economic & workforce development**

Maintain a focus on the fundamentals of economic and workforce development. Many of the barriers that Washington must overcome are not specific to a green economy. Rather, the greatest challenges are those that *currently* inhibit innovation and new business development in Washington generally.

**Be consistent**

Chart a path and stick with it (greenhouse-gas reduction goals, cap-and-trade framework, etc). Green industries, and the suppliers and manufacturers that support them, need certainty. The state must supply a long-term commitment, expressed in policy and in messages, before firms can design long-term funding plans and build capacity.

**Use our natural advantages**

Build on existing capacities and systems in the public and private sectors. Integrate strategies into existing programs (economic development, small-business assistance, tax incentives, workforce development, research and development), rather than launch new, independent projects.

**Coordinate and support local governments**

Strategies must be cross-cutting and systemic and must engage every aspect of supply chains and economic development planning (land use, industry and manufacturing). This will require cooperative implementation and co-design with local governments. Many local governments have already initiated sustainability policies and need help with such things as finance development and planning authority.

Source: Washington State’s, Green Economy, A Strategic Framework, Discussion Draft, January 2009.  
[http://www.ecy.wa.gov/climatechange/greeneconomy\\_framework.htm](http://www.ecy.wa.gov/climatechange/greeneconomy_framework.htm)