

EPA’s Clean Energy-Environment Tech 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.¹ 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.

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.² 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.”³

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):⁴

“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.”

¹ www.ases.org/greenjobs

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

³ http://www.whitehouse.gov/blog_post/save_the_date_1/

⁴ 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.⁵ The study 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.⁶ 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.⁷

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.⁸

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 jobs which met their definition of green jobs. 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 2007.⁹ Evaluating three

⁵ http://www.ases.org/images/stories/ASES/pdfs/CO_Jobs_Rpt_Jan2009_summary.pdf

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

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

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

⁹ 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.¹⁰

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.¹¹ 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).

¹⁰ U.S. Department of Labor, Office of the Assistant Secretary for Policy, http://www.dol.gov/asp/programs/drugs/workingpartners/dfworkforce/dfwf_wfd.asp

¹¹ <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). 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 regions. 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 Program Creates Demand for New Businesses and Keeps Stringent Installation Requirements

Massachusetts' Commonwealth 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.¹² Traditional providers of workforce training include:

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

¹² 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.

There are at least two major accreditation bodies that 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.)
- **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.ispqua.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

What Certifications Are Used?

There are a small handful of energy efficiency and renewable energy certification bodies 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 body that evaluates and “approves” the veracity of the certification standards that each body sets—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.

- **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 certified rater. Rater may then be certified by RESNET accredited Rating Provider.”* See www.natresnet.org.

- **North American Board of Certified Energy Practitioners (NABCEP).** Offers national credentialing and certifications for renewable energy professionals—specifically a certification program for solar electric (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.

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. 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 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

Examples of State Programs	
State	Program Name
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
States with Green Jobs Analyses / Action Plans	
State	Report Name
New York	<i>Working Group VII – Workforce Training and Development Scope, Task, and Schedule</i> (August 2008), http://www.dps.state.ny.us/07M0548_Working_groups_phase2.htm
Oregon	<i>An Analysis of Clean Energy Workforce Needs and Programs in Oregon</i> (May 2008), http://www.worksourceoregon.org/index.php/component/docman/doc_details/734-analysis-of-clean-energy-workforce-needs-and-programs-in-oregon
Tennessee	<i>Growing Green: The Potential for Green Job Growth in Tennessee</i> (November 2008), http://www.state.tn.us/labor-wfd/Publications/EmploymentSecurity/GrowingGreenInTN2008.pdf
Minnesota	<i>MN Green Jobs Task Force Draft Action Plan</i> (January 2009), http://www.mngreenjobs.com/
Washington State	<i>2008 Washington State Green Economy Jobs</i> (February 2009), http://energy.wsu.edu/documents/Green_Jobs_Report_2008.pdf
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.</i>
Examples of Recent Legislation	
State	Legislation
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 launching 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, Green Economy, A Strategic Framework, Discussion Draft, January 2009

Attachment I

Synopsis of Example State Workforce Development Programs and Related Legislation

Example State Programs / Activities

Iowa

Workforce Training and Economic Development Fund

In May 2007, Governor Culver signed into law H.F. 918 and its companion, H.F. 927. H.F. 918 established the Office of Energy Independence (OEI) and the Iowa Power Fund (IPF), and H.F. 927 appropriated \$100 million over four years from the state's general fund to the OEI to finance the IPF. Of that amount, \$2.5 million is to be allocated each year (\$10 million total) to the Iowa Department of Economic Development for deposit into the Workforce Training and Economic Development Fund, which can be used by Iowa's community colleges for a variety of existing job training and career and technical education programs, career academies, and workforce development programs related to clean energy.

H.F. 927 can be viewed at: <http://coolice.legis.state.ia.us/Cool-ICE/default.asp?Category=billinfo&Service=Billbook&frame=1&GA=82&hbill=HF927>

New Jobs Training Program

The Iowa New Jobs Training Program (NJTP) was created in the early 1980s, when an agricultural crisis hit the state and policymakers recognized the need to broaden and diversify the base of the state's economy. It was designed as an economic development incentive to stimulate job creation in businesses bringing new money into the state. The NJTP provides funding to support the cost of training new employees in new business startups or the expansion of existing firms, using a unique financing mechanism. The program authorizes Iowa's 15 community colleges to issue bonds for up to 10 years on behalf of a business that is creating jobs. The proceeds of the bond sale support the training required for the new jobs and related program administrative expenses. The bonds are paid off by diverting to the college 1.5 or 3 percent of the increased payroll tax revenues resulting from the creation of jobs. Local property tax receipts resulting from new capital investment made to support the new jobs can also be encumbered for up to 10 years through the use of tax increment financing (TIF), although TIF is seldom used anymore. The program currently has a revenue-neutral impact on the state budget because the colleges are retiring bonds at a rate equal to the issuance of new bonds. When the bonds are retired, the payroll taxes revert to the general fund.

More information about the Iowa NJTP can be found at: <http://iwcc.cc.ia.us/ewd/260e.asp>.

Example of New Jobs Training Program

Iowa Central Community College used NJTP to support five start-up biofuel plants. The companies sought skilled and experienced workers, preferably with two-year degrees; the community college issued bonds to support training programs for the new jobs. The following table shows projected jobs and wages at the start-ups, as well as training funds leveraged and invested by NJTP.

Year	Company	Jobs	Average Wage /Hr.	Total Bond Issue	Training
2005	Vera Sun	42	\$14.00	\$285,000	\$190,323
2005	Corn LP	31	\$14.00	\$285,000	\$190,323
2006	Western Iowa Energy	26	\$15.50	\$205,000	\$132,307
2006	US Bio Energy	47	\$16.24	\$405,000	\$259,362
2007	Tate & Lyle	84	\$24.00	\$1,115,000	\$690,366

Source: Greener Pathways: Jobs and Workforce Development in the Clean Energy Economy. Available at: <http://www.cows.org/pdf/rp-greenerpathways.pdf>.

New Mexico

Governor Bill Richardson on January 22, 2009 released details of his newly created Green Jobs Cabinet. The new cabinet has been directed by the Governor to enhance clean energy and clean technology economic development and job creation.

“I have signed an executive order directing key state agencies--from education to workforce development, and from economic development to energy--to form a "Green Jobs Cabinet,” said Governor Richardson. “The Green Jobs Cabinet will develop an aggressive clean energy strategy, so our state attracts clean technology companies and educates, trains, and prepares the clean energy workforce of the future.”

The press release that accompanies the executive order can be found at: <http://www.governor.state.nm.us/press.php?id=1042>.

New York

On February 25, 2008, the New York State Energy Research and Development Authority (NYSERDA) announced two major initiatives to help strengthen the evolving renewable energy arena in New York State through workforce development.

New York State is initiating a \$6-million clean energy workforce training initiative. NYSERDA will invest more than \$4 million in a range of clean energy sectors from PV, to small wind, to biogas energy systems. An additional \$2 million is included in the Governor's Executive Budget targeted at developing the solar workforce through programs at community colleges across New York State. These efforts will help develop a workforce which can design, install and maintain renewable energy systems and ensure successful implementation and promotion of these technologies in New York State.

NYSERDA is also seeking to establish a Wind Energy Research and Testing Center in New York. Still in the preliminary stages of discussion and planning, the center would catalyze and support research for example, in advanced materials, power electronics, turbine design, wind forecasting, and environmental impact assessment. The proposed center would also provide resources to test new products and help provide a highly skilled workforce to meet the needs of this growing industry.

To view the press release announcement, visit:

http://www.neec.org/news_room/news_releases_viewer.asp?id=115. For more information about this and other New York State initiatives, see: <http://www.powernaturally.org/>.

North Carolina

North Carolina Green Business Fund

H.B. 1473, signed on July 31, 2007, establishes the NC Green Business Fund for grants to private businesses with less than 100 employees, nonprofit organizations, local governments, and state agencies to help grow a green economy in the state. The bill specifies that workforce development is one of the activities eligible to receive funding. The fund focuses on the priority areas of the biofuels industry, the green buildings industry, and clean technology and renewable energy products and businesses. The North Carolina Board of Science and Technology, a division of the North Carolina Department of Commerce, administers the Green Business Fund. In the 2008 awards cycle, no grants were given to organizations specifically engaged in workforce development. The deadline for 2009 applications is March 30, 2009.

H.B. 1473 can be accessed at:

<http://www.ncleg.net/gascripts/BillLookUp/BillLookUp.pl?Session=2007&BillID=H1473>. More information about the NC Green Business Fund, including applications for grants, requests for grant proposals, eligibility criteria and other guidelines are available at the Board of Science and Technology's Web site at: <http://www.ncscienceandtechnology.com/gbf/index.htm>.

Oregon

Sustainable Oregon Workforce Initiative

Oregon has created the Sustainable Oregon Workforce Initiative in order to help transform its workforce education and training system to keep pace with economic changes including globalization, an aging workforce, advancing technology, shifting worker attitudes, and a significant loss of family wage jobs. To accomplish these goals, the state has identified three strategies:

- Strengthen employer consortia and industry-led training to produce highly skilled and innovative workers who are able to earn a family wage and benefits.
- Prepare an agile and innovative workforce able to continuously adapt to technology changes.
- Build a flexible, demand-driven workforce education and training system that is outcome-based, customer-focused, accessible, adequately funded and grounded in public-private partnerships.

To accomplish these goals, the Oregon Workforce Investment Board has invested in three targeted public-private partnerships, one of which focuses on clean energy. The clean energy partnership was established in early 2007, when the state of Oregon, via the Governor's Strategic Training Fund, contracted the Business Alliance for Sustainable Energy (BASE) to implement the Sustainable Oregon Workforce Initiative (SOW). BASE is a consortium of sustainable energy companies and stakeholders and is a project of 3EStrategies, an Oregon not-for-profit corporation. The goal of SOW is to accelerate development of the sustainable energy industry in Oregon by coordinating and enhancing clean energy workforce development programs across the state.

In 2007, SOW performed a gap analysis identifying existing clean energy workforce training programs and the top clean energy industry workforce needs. This report, "An Analysis of Clean Energy Workforce Needs and Programs in Oregon," includes a compilation of information gathered from clean energy companies and workforce education and training providers, an identification of the top near-term needs of clean energy employers, and a set of recommendations and next steps. Some of the recommendations included:

- Strengthening the workforce system’s ability to address short-term needs of clean energy industry by building capacity of key university, community college, and union training programs.
- Implementing measures to build efficiency, resiliency, and sustainability in the clean energy workforce training system, such as identifying long-term sustainable funding, and supporting apprenticeship, training, and mentoring programs.
- Adding sustainability elements into core curricula for conventional academic and technical programs.
- Tracking employment and wage information for the clean energy industry.

The report can be found at:

http://www.worksourceoregon.org/index.php/component/docman/doc_details/734-analysis-of-clean-energy-workforce-needs-and-programs-in-oregon.

Workforce Response Team

Workforce Response Teams (WRT) are resource teams for businesses and workers that come together to help their customers solve business challenges or proactively work with groups of workers or businesses in key industries to address workforce development and training needs. Oregon is divided into 15 workforce regions, each of which has formed a WRT to respond to the needs of businesses and workers. The regional WRT core team consists of representatives from the Employment Department, Community College, Title 1-B Provider, one or more local economic development organizations, the Oregon Economic and Community Development Department Regional Development Officer, and other representatives as determined by the region to be necessary. Additional team members from business, labor, higher education, industry associations, or other local economic development organizations can be added as appropriate to the core WRT to perform the function of awarding grants to eligible businesses.

WRTs utilize data and statewide policies to determine the strategic focus of their regional training funds; develop strategies to work with multiple employers in a sector and/or cluster to maximize regional and statewide impacts; and solve challenges that businesses face when retaining their workforce or expanding their businesses. Clean energy workforce development programs are one focus of the WRTs. WRTs receive financial support for incumbent worker training and consortia building from the state’s Employer Workforce Training Fund, which was created by executive order of the governor in 2003, and which draws on Workforce Investment Act statewide activities funds and rapid response funds.

More information about the Sustainable Oregon Workforce Initiative and Workforce Response Teams can be found on the WorkSource Oregon Web site at: <http://www.worksourceoregon.org/>.

Vermont

Vermont Sustainable Jobs Fund

The Vermont Legislature created the Vermont Sustainable Jobs Fund (VSJF) in 1995 to build markets for sustainable development and increase the demand for and supply of sustainable products. Since 1997, the Fund has made grants of over \$2.7 million to 150 recipients and provided technical assistance and business coaching to many others. Grants have ranged in size from \$500 to \$98,000. Technical assistance has included (1) raising and leveraging additional project funds, (2) building strategic alliances with key stakeholders, (3) providing business assistance to early-stage entrepreneurs, (4) acting as a fiscal agent for other nonprofits, (5) developing education materials and resources for other organizations, and (6) providing strategic direction advice to growth stage companies. From 1997 to 2007, VSJF grants benefited over 8,800 businesses and created or retained at least 800 jobs. Because of limited funding and staff capacity, VSJF typically focuses on two or three of the market sectors identified by the legislature at any one time. Current efforts are focused on biofuels, renewable energy, forestry, and agriculture.

More information on the Vermont Sustainable Jobs Fund can be found at:
<http://www.vsjf.org/>

Washington

Renewable Energy Apprenticeship

Washington included a provision in its 2006 Renewable Portfolio Standard that provides additional renewable energy credits for utilities offering apprenticeship programs to train new workers in the renewable energy field.

Washington's RPS legislation is available at:
<http://www.secstate.wa.gov/elections/initiatives/text/I937.pdf>

Example State Legislation

Colorado

Green Jobs Legislation (HB 1025)

HB 1025, signed by Governor Ritter on March 18, 2008, tasks the Governor's Energy Office with developing renewable energy curricula in collaboration with the Department of Higher Education to serve the workforce needs of the renewable energy industry. It specifies that such collaboration may include research institutions, state colleges, community colleges, and trade organizations, and provides that, in developing new curricula, these institutions may partner with organizations that currently have curricula and training programs on renewable energy.

HB 1025 can be viewed at:

http://www.leg.state.co.us/CLICS/CLICS2008A/csl.nsf/fsbillcont3/7DCA9D63A44957D08725737F00732CD3?Open&file=1025_enr.pdf.

Kentucky

Energy Technology Career Track Program

H.B. 2, signed by the governor on April 24, 2008, requires that state-owned or -leased buildings meet high-performance building standards. The bill also mandates that the Department for Workforce Investment establish an energy technology career track program. The purpose of the program is to provide grants to school districts to develop and implement an energy technology engineering career track across middle and high schools within the district. Program components may include career exploration and counseling, strategies to increase the rigor of instruction in pertinent core content areas, strategies to link core content to an energy technology career focus, professional development for teachers, and cooperative learning opportunities with industry and postsecondary institutions. Development of the program is contingent on the availability of funds.

H.B. 2 can be accessed at: <http://www.lrc.ky.gov/RECORD/08RS/HB2.htm>.

Maryland

Maryland Strategic Energy Investment Fund

H.B. 368, approved by the governor on April 24, 2008, established the Maryland Strategic Energy Investment Fund in the Maryland Energy Administration. At least 46 percent of the funds must be spent on energy efficiency and conservation programs, including grants to training funds and other organizations supporting job training for deployment of energy efficiency and energy conservation technology and equipment.

H.B. 368 can be viewed at:

<http://mlis.state.md.us/2008rs/bills/hb/hb0368e.pdf>.

Massachusetts

Green Jobs Act

The Green Jobs Act (H.B. 5018), signed into law on September 12, 2008, created the Massachusetts Clean Energy Technology Center and provided for \$43 million in funding to support the emerging green economy in Massachusetts (recently reduced to \$33 million¹³). Operating under the Executive Office of

¹³ In November 2008 Massachusetts lawmakers, faced with an estimated \$1.4 billion budget deficit, opted to cut \$10 million in funding for the Massachusetts Clean Technology Center. It is not yet clear how the cuts will affect the center's budget. More information on the budget cuts is available at:

Energy and Environmental Affairs (EOEEA), the center will work to create clean energy jobs; promote research and workforce training in clean energy technology in the state's public colleges and universities; support the expansion of existing clean energy companies; and foster collaboration between industry, state government, research universities, and the financial sector to advance clean energy technology in Massachusetts.

The center will oversee the newly created Massachusetts Alternative and Clean Energy Investment Trust Fund, which will provide grants to state educational institutions to develop clean energy curricula. The Green Jobs Act authorizes the Secretary of EOEEA to spend \$1 million in FY09 for a workforce training and development program, targeting public colleges and universities, vocational-technical schools, and community-based organizations. By February 1, 2009, the EOEEA must complete an investigation of the clean energy sector of Massachusetts' economy. The study must include an examination of the future workforce needs of the clean energy sector and the growth rate of related in-state jobs and businesses.

H.B. 5018 can be viewed at:

<http://www.mass.gov/legis/bills/house/185/ht05pdf/ht05018.pdf>.

Michigan

Centers of Energy Excellence Program

S.B. 1380, approved on July 8, 2008, allows the Michigan Strategic Fund—which was created by public act in 1984 and granted broad authority to promote economic development and create jobs—to create and operate an energy excellence program to promote energy sectors in the state. The legislation authorizes the Strategic Fund to spend up to \$45 million on the Centers of Energy Excellence program, which will support alternative energy through accelerating research, workforce development, and commercialization.

S.B. 1380 can be accessed at:

<http://www.legislature.mi.gov/documents/2007-2008/publicact/pdf/2008-PA-0175.pdf>

Minnesota

Green Jobs Task Force

S.F. 3096, signed on May 23, 2008, created the Minnesota Green Jobs Task Force to advise and assist the governor and legislature regarding activities to transform the state's economy and to develop a statewide action plan. The legislation specifies that the task force is to be made-up of legislators, state agency representatives, and representatives of the utility industry, financial institutions, environmental organizations, and a local economic development authority. Its duties are to analyze labor force needs relative to the green economy, including educational, training, and retraining needs. The task force will submit a report to the governor by January 15, 2009 that presents a statewide action plan to optimize the growth of the green economy in the state. The plan will include draft legislation and a budget request and may include administrative actions of government entities, collaborative actions, and actions of individuals and individual organizations. Related to green jobs, the analysis must include an analysis of the labor force needs including educational, training, and retraining needs and an inventory of the current labor and business assets available to respond to green labor force needs.

S.F. 3096 can be accessed at:

<https://www.revisor.leg.state.mn.us/bin/bldbill.php?bill=S3096.3.html&session=ls85>.

<http://sanfrancisco.bizjournals.com/sanfrancisco/othercities/boston/stories/2008/11/24/focus13.html?b=1227502800%5E1736440&brthrs=1>.

Ohio

Edison Technology Centers

Ohio S.B. 221, approved by the governor on May 1, 2008, provides funding for the Edison Technology Center program—a public-private partnership—to create an advanced energy manufacturing center. The new center will foster the exchange of information and expertise related to advanced energy, assist with the design of advanced energy projects, develop workforce training programs for advanced energy projects, and encourage investment in advanced energy manufacturing technologies and sustainable manufacturing operations.

S.B. 221 is available at: http://www.legislature.state.oh.us/bills.cfm?ID=127_SB_221.

Vermont

Green Job Legislation – H.B. 885

H.B. 885, signed by the governor on June 2, 2008, formulates a strategy for environmental technology sector workforce development and training with the goal of developing programs that promote the sector and create a competitive workforce equipped with the needed skills and competencies. Under the legislation, the Commissioner of Labor and the Secretary of Commerce must conduct a green business labor force analysis by February 1, 2009. The bill further directs the Commissioner of Labor to develop a workforce development plan related to the green building, energy efficiency, and renewable energy industries. The plan will address implementation of training programs for the environmental technology sector—defined as businesses and organizations in or related to waste management, natural resource protection and management, energy efficiency or conservation, clean energy (including solar, wind, wave, hydro, geothermal, hydrogen, fuel cells, waste-to-energy, biomass), and any other environmental technology certified by the Secretary of Commerce.

H.B. 885 can be accessed at:

<http://www.leg.state.vt.us/docs/legdoc.cfm?URL=/docs/2008/acts/ACT182.HTM>.

Washington

Green Job Legislation – S.B. 6516

In 2007, the governor issued an executive order, later affirmed by the state legislature in S.B. 6001, creating goals to reduce Washington’s global warming pollution and increase the number of green jobs in the state to 25,000 by 2020. In January 2008, the state legislature passed S.B. 6516, codifying green job strategies for meeting the goal. The legislation:

- Directs the Employment Security Department (ESD), in consultation with other states agencies, to analyze the labor market and projected job growth in green energy sectors, the current and projected recruitment and skill requirement of green industry employers, the wage and benefits ranges of jobs within green energy sectors, and the education and training requirements of entry-level and incumbent workers within those sectors. Based on this research, ESD will propose which industries should be considered high-demand green industries—based on current and projected job creation and their strategic importance to the development of the state’s clean energy economy, and which jobs within those industries should be considered high-wage occupations and occupations that are part of career pathways to the same—based on family-sustaining wage and benefit ranges.
- Directs the Washington State Workforce Training and Education Coordinating Board (SWTECB) to create and pilot Green Industry Skill Panels (GISPs), funds for which will be distributed on a

competitive basis. Like regular Industry Skill Panels (ISPs)¹⁴, the GISPs will be organized around broad partnerships: business representatives from industry sectors related to renewable energy or energy efficiency; labor unions representing workers in those industries, labor affiliates administering joint apprenticeship programs, or labor-management partnership programs that train workers for these industries; employer associations; educational institutions; local workforce investment boards within the regions that the GISPs operate; and other key stakeholders.

- Authorizes the creation of a Green-Collar Job Training Fund for the purpose of training workers for high-wage occupations, or occupations that are part of career pathways to the same in high-demand industries related to clean energy. Funds will be appropriated beginning in 2009, administered by the State Board for Community and Technical Colleges (SBCTC) in consultation with the SWTECB, and informed by the labor market research of the ESD and the GISPs. The SBCTC will distribute grants from the fund on a competitive basis. Applicants eligible to receive these grants may be any organization or a partnership of organizations that has demonstrated expertise in implementing effective education and training programs that meet industry demand, and recruiting and supporting successful completion to targeted populations of workers. Target populations for use of the fund are: low-income adults and youth in families under 200 percent of the federal poverty guidelines or a locally defined self-sufficiency standard; entry-level or incumbent workers in high-demand green industries who are in, or are preparing for, high-wage occupations; or dislocated workers in declining industries who can be re-trained for high-wage occupations in high-demand green industries.

S.B. 6516 can be accessed at: <http://apps.leg.wa.gov/billinfo/summary.aspx?bill=6516&year=2007>.

¹⁴ Industry Skill Panels (ISPs), a program administered by the Washington State Workforce Training and Education Coordinating Board, have become a model for state-supported sectoral workforce development strategy. ISPs are regional partnerships of education, business, labor, and local workforce investment boards tasked with identifying skills gaps within particular industry clusters and developing proactive solutions to benefit multiple employers within industries—not just a single employer, as with the more traditional economic development and business recruitment practice. Targeted employers offer career ladder jobs that drive the state’s regional economies, such as healthcare, manufacturing, aerospace, and energy.

Attachment II
Clean Energy Workforce Development Resources for States

Example State Programs / Activities

Iowa	
Workforce Training and Economic Development Fund (H.F. 927)	http://coolice.legis.state.ia.us/Cool-ICE/default.asp?Category=billinfo&Service=Billbook&frame=1&GA=82&hbill=HF927
New Jobs Training Program	http://iwcc.cc.ia.us/ewd/260e.asp
New Mexico	
Green Jobs Cabinet	http://www.governor.state.nm.us/press.php?id=1042
New York	
NYSERDA Workforce Training Initiative	http://www.powernaturally.org/
North Carolina	
Green Business Fund (H.B. 1473)	http://www.ncleg.net/gascripts/BillLookUp/BillLookUp.pl?Session=2007&BillID=H1473
	http://www.ncscienceandtechnology.com/gbf/index.htm
Oregon	
Sustainable Workforce Initiative	http://www.3estrategies.org/BASE/SustainableOregonWorkforce.asp
Vermont	
Sustainable Jobs Fund	http://www.vsjf.org/
Washington	
Renewable Energy Apprenticeship	http://www.secstate.wa.gov/elections/initiatives/text/I937.pdf
Multiple States	
State-reported activities, collected by NARUC (January 2009)	http://www.naruc.org/Publications/Energy%20Efficiency%20Training%20-%20NARUC%20Survey%20Results.pdf
Article providing examples of programs around the country (January 2009)	http://www.dallasnews.com/sharedcontent/dws/bus/stories/010409dnnatgreenjobs.2124064.html
Article providing a snapshot of what is happening to develop and train solar installers in the Northeast (Spring 2008)	http://www.nesea.org/uploads/textWidget/876.00010/documents/nesea-sun_sp08_Building_Workforce.pdf
<i>Greener Pathways: Jobs and Workforce Development in the Clean Energy Economy</i> (2008)	http://www.cows.org/pdf/rp-greenerpathways.pdf

Example Local Government Programs/Activities

Boston	
“Green Collar” Jobs Program	http://www.cityofboston.gov/news/default.aspx?dept=55
Chicago	
Chicagoland Green-Collar Jobs Initiative	http://www.greencollarchicago.org/
Los Angeles	
The LA Infrastructure and Sustainable Jobs Collaborative	http://www.lattc.edu/dept/lattc/REDI/Utility.html
Green Jobs: Los Angeles Apollo Alliance	http://www.scopela.org/
Oakland	
Oakland Green Jobs Corps	http://www.ellabakercenter.org/index.php?p=gcjc_green_jobs_corps_gre_enlight
Richmond	
Richmond BUILD Pre-apprenticeship Construction Skills & Solar Installation Training	http://www.ci.richmond.ca.us/index.asp?NID=1243
Multiple Cities	
<i>Green-Collar Jobs in America's Cities: Building Pathways Out of Poverty and Careers in the Clean Energy Economy</i> (2008)	http://www.apolloalliance.org/downloads/greencollarjobs.pdf

Examples of Recent State Legislation

Colorado	
Green Jobs Legislation (HB 1025)	http://www.leg.state.co.us/CLICS/CLICS2008A/csl.nsf/fsbillcont3/7DC A9D63A44957D08725737F00732CD3?Open&file=1025_enr.pdf
Florida	
Energy and Climate Change Action Plan	http://www.dep.state.fl.us/ClimateChange/files/action_plan/chap7_gov_policy.pdf
Kentucky	
Energy Technology Career Track Program (H.B. 2)	http://www.lrc.ky.gov/RECORD/08RS/HB2.htm
Maryland	
Maryland Strategic Energy Investment Fund (H.B. 368)	http://mlis.state.md.us/2008rs/bills/hb/hb0368e.pdf
Massachusetts	
Green Jobs Act (H.B. 5018)	http://www.mass.gov/legis/bills/house/185/ht05pdf/ht05018.pdf
Michigan	
Centers of Energy Excellence Program (S.B. 1380)	http://www.legislature.mi.gov/documents/2007-2008/publicact/pdf/2008-PA-0175.pdf

Minnesota	
Green Jobs Task Force (S.F. 3096)	https://www.revisor.leg.state.mn.us/bin/bldbill.php?bill=S3096.3.html&session=ls85
Ohio	
Edison Technology Centers (S.B. 221)	http://www.legislature.state.oh.us/bills.cfm?ID=127_SB_221
Vermont	
Green Job Legislation (H.B. 885)	http://www.leg.state.vt.us/docs/legdoc.cfm?URL=/docs/2008/acts/ACT182.HTM
Washington	
Green Job Legislation (S.B. 6516)	http://apps.leg.wa.gov/billinfo/summary.aspx?bill=6516&year=2007

State Assessments of Green Jobs Potential

Oregon	
<i>An Analysis of Clean Energy Workforce Needs and Programs in Oregon</i> (May 2008)	http://www.worksourceoregon.org/index.php/component/docman/doc_details/734-analysis-of-clean-energy-workforce-needs-and-programs-in-oregon
Tennessee	
<i>Growing Green: The Potential for Green Job Growth in Tennessee</i> (November 2008)	http://www.state.tn.us/labor-wfd/Publications/EmploymentSecurity/GrowingGreenInTN2008.pdf
Minnesota	
<i>MN Green Jobs Task Force Draft Action Plan</i> (January 2009)	http://www.mngreenjobs.com/
Washington State	
<i>2008 Washington State Green Economy Jobs</i> (February 2009)	http://energy.wsu.edu/documents/Green_Jobs_Report_2008.pdf

National Assessments of Green Jobs Potential

EESI Summary of Green Jobs Potential Studies	
<i>Jobs from Renewable Energy and Energy Efficiency</i> (October 2008)	Factsheet that catalogs numerous studies of the number of jobs that could be created through energy efficiency and renewable energy policies, by location/scope and technology: http://www.eesi.org/files/green_jobs_factsheet_102208.pdf
American Solar Energy Society (ASES)	
<i>Green Collar Jobs Report</i> (January 2009)	www.ases.org/greenjobs
Center for American Progress	

<i>Green Recovery</i> (September 2008)	Report demonstrates how a green recovery program that spends \$100 billion over two years would create 2 million new jobs. <i>Includes state-by-state fact sheets and tables</i> listing types of jobs that would be needed in each sector: http://www.americanprogress.org/issues/2008/09/green_recovery.html
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Federal Resources for States

Basic Workforce Development Information and Resources	
U.S. DOL Workforce Professionals Home Page	First stop for numerous resources, tools, updates, and links intended to assist the nation's workforce professionals in serving the needs of workers and business: http://www.doleta.gov/USWORKFORCE/
U.S. DOL Industry/Employers Workforce Home Page	First stop for understanding the public workforce system; how it can help meet business/economic development objectives; how to get involved in one's own region: http://www.doleta.gov/business/
National Registered Apprenticeship Program	http://www.doleta.gov/OA/
Select Department of Labor Grant Programs	
Community-Based Job Training Grants	The primary purpose of Community-Based Job Training Grants is to build the capacity of community colleges to train workers in the skills required to succeed in high growth, high demand industries. This competitive grant program builds on the High Growth Job Training Initiative, a national model for demand-driven workforce development implemented by strategic partnerships among the workforce investment system, employers, and community colleges: http://www.doleta.gov/Business/Community-BasedJobTrainingGrants.cfm
WIRED Grants	WIRED goes beyond traditional strategies for worker preparation by bringing together state, local and federal entities; academic institutions (including K-12, community colleges and universities); investment groups; foundations; and business and industry to address the challenges associated with building a globally competitive and prepared workforce: http://www.doleta.gov/wired/
Technical Resources	
Industry and Labor Market Statistics	www.doleta.gov/programs/sources.cfm
Occupational competency models	Competency models (industry-verified knowledge, skills, and experience) for various sectors/skills by occupation: http://www.careeronestop.org/competencymodel/
Standard Occupational Classification (SOC) system codes	SOC is used by federal and state agencies to classify workers into occupational categories for the purpose of collecting, calculating, or disseminating data: http://www.bls.gov/SOC/
Home Performance with ENERGY STAR	Home Performance with ENERGY STAR, a national program from the U.S. EPA and U.S. DOE, offers a comprehensive, whole-house approach to improving energy efficiency and comfort at home, while helping to protect the environment: http://www.energystar.gov/index.cfm?c=home_improvement.hm_improvement_hpwes

The Green Jobs Act of 2007	
See Title X	http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=110_cong_bills&docid=f:h6enr.txt.pdf

Non-Governmental Resources for States

Technical Resources	
<i>Inspector Guidelines for PV Systems</i> (March 2006)	Renewable Energy Technology Analysis Project of the Pace University Law School Energy Project: http://www.irecusa.org/fileadmin/user_upload/NationalOutreachPubs/InspectorGuidelines-Version2.1.pdf
Building Performance Institute (BPI)	Certifies building contractors: http://www.bpi.org
Residential Energy Services Network (RESNET®)	Certifies building raters: http://www.natresnet.org
North American Board of Certified Energy Practitioners (NABCEP)	Certifies renewable energy professionals: http://www.nabcep.org
Education / Training Resources	
<i>Going Green: The Vital Role of Community Colleges in Building a Sustainable Future and Green Workforce</i> (February 2009)	http://www.aed.org/News/Releases/going_green.cfm
Interstate Renewable Energy Council's (IREC's) <i>Renewable Energy Training Best Practices & Recommended Guidelines</i> (September 2008)	http://www.irecusa.org/fileadmin/user_upload/WorkforceDevelopmentDocs/Training-BestPractices_Sept_2008_FINAL.pdf
Conference: <i>New Ideas in Educating a Workforce in Renewable Energy and Energy Efficiency</i> (March 2008)	Sessions dealt with market trends, economic drivers, instructional strategies, curricula development, and best practices for training in the renewable energy and energy efficiency fields. Conference presentations: http://www.irecusa.org/index.php?id=117
American National Standards Institute (ANSI) / International Organization of Standardization (ISO)	Accredits training providers: http://www.ansi.org/conformity_assessment/personnel_certification/overview.aspx
Institute for Sustainable Power Quality (ISPQ)	Accredits training providers: http://www.ispqua.org