

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

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**State and Local
Climate and Energy Program**



What are Green Jobs?

- There is no commonly shared definition of “**green jobs**”
 - One U.S. Department of Labor effort to catalog green jobs definitions produced more than a dozen different definitions from reputable sources.
- Vice President Biden’s Middle Class Task Force has used:

“Green jobs are jobs that provide products and services which use renewable energy resources, reduce pollution, conserve energy and natural resources and reconstitute waste.”

What are Clean Energy Jobs?

- **Clean energy (CE) jobs are a *subset* of green jobs related to:**
 - **energy efficiency (EE)**
 - **renewable energy (RE)**
 - **clean combined heat and power (CHP)**

- American Solar Energy Society defines clean energy jobs as:

“A job in the RE industry consists of an employee working in one of the major RE technologies—wind, photovoltaics, solar thermal, hydroelectric power, geothermal, biomass, and fuel cells and hydrogen.

A job in the EE industry consists of an employee working in a sector that is part of the EE industry, such as an energy service company 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 appliances, HVAC systems, construction, auto 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, foundations, consultancies, investment companies, and other related organizations.”

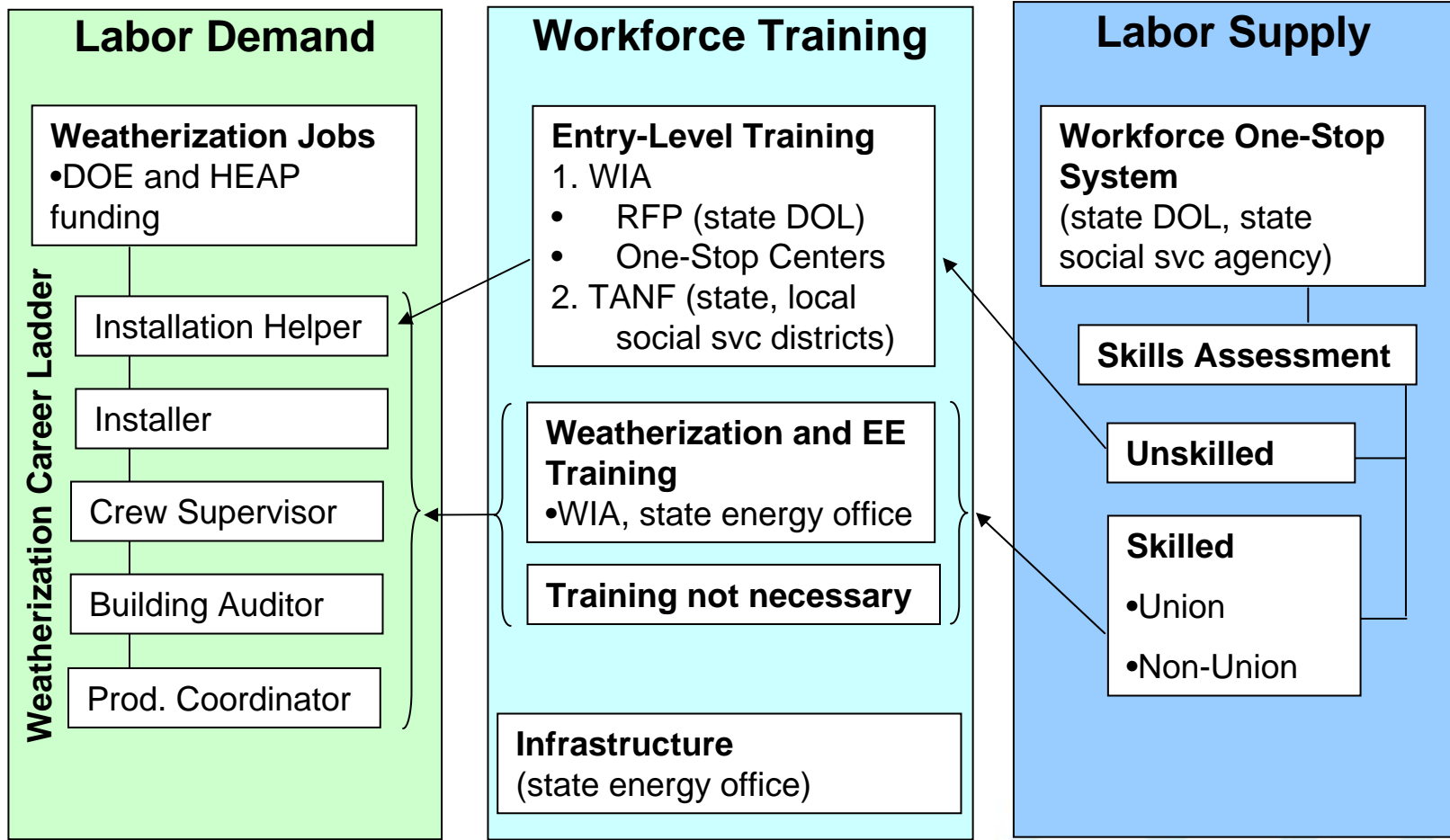
Why Does EPA Care About Clean Energy Jobs?



1. To reduce greenhouse gas (GHG) emissions, the U.S. needs to reach significant EE and RE goals.
2. An appropriately trained RE and EE workforce will be needed to implement CE programs.
3. As the CE market grows, the successful expansion of national, state, and local CE programs will ultimately hinge on:
 - The supply of professionals to perform the work
 - The quality of the services delivered
 - The ability to document energy and GHG reductions

What is Clean Energy Workforce Development?

Weatherization Example (New York State)



Courtesy of Anthony Joseph, New York State Department of Labor

Current Barriers to Clean Energy Workforce Development

- **Market development**
 - Demand not yet high enough for many EE/RE services and products to create jobs.
 - Training providers do not have enough confidence in market growth to start training programs.
- **Capacity development**
 - Some training providers do not have sufficient capacity to develop effective programs (i.e., not enough qualified trainers; limited facilities for hands-on).
 - Many states have enacted legislation for green jobs development but do not yet know how to establish effective programs that will meet future needs.
- **Curriculum development**
 - Not all certifications are widespread; standard curricula for certifications do not exist.
 - Not all clean energy job types have well-established, market-vetted certifications.
 - Specific skill sets have not yet been defined for all new job types.
- **Tracking results**
 - Department of Labor (DOL) does not have “green jobs” or “clean energy jobs” classifications within labor data that are routinely collected and reported.
 - Measuring and tracking the number of workers employed in clean energy within sectors is not straightforward.
 - Measuring jobs maintained or created is very difficult; potential for greenwashing.

Basic Steps Toward Clean Energy Workforce Development

- 1. Support RE / EE policies** that will achieve CE goals; expanded use of CE services and products will provide markets for new businesses and employees.
- 2. Estimate current and future projections** of business and labor market status in target market(s) to identify gaps.
 - Leverage labor market data; track statistics related to industry; use DOL competency models; convene skills panels
- 3. Develop partnerships** across workforce development entities to create successful and sustainable tactics and approaches for closing the gaps.
 - Leverage government, industry, union, and NGO resources; involve community colleges, technical high schools, community-based organizations; create sector-based collaboratives

Basic Steps: Training

- **Traditional providers** of workforce training:
 - Community Colleges
 - Vocational/Technical High Schools
 - Community-Based Organizations
 - Labor Unions
 - Trade Associations
 - Four-Year Colleges and Universities
- Training providers should be **accredited**. Some options:
 - ANSI/ISO/IEC 17024
 - Institute for Sustainable Power Quality (ISPQ)

Basic Steps: Certifications

- **Building Performance Institute (BPI)**
 - Certified Building Analyst: weatherization auditors, energy efficiency installation personnel, professionals in the residential and multifamily building performance contracting industry
www.bpi.org
- **Residential Energy Services Network (RESNET®)**
 - Certified Home Energy Rater: raters that evaluate buildings based on a relative energy use index called the HERS® Index
www.resnet.us
 - In California:
 - CalCERTS www.calcerts.com
 - CHEERS www.cheers.org
- **North American Board of Certified Energy Practitioners (NABCEP)**
 - Certified Energy Practitioner: solar electric (photovoltaic [PV]) installers, solar thermal installers
www.nabcep.org

What are States Doing?

States and municipalities have used various strategies for developing CE workforce development programs

Some common approaches have included:

- **Evaluating the current CE 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 providers:** universities, community colleges, and vocational/technical high schools to integrate CE workforce training curricula and programs.
- **Tailoring programs** for low-income workers.

What are States Doing?

Some unique approaches have included:

- **Awarding additional renewable energy certificates (RECs)** to utilities with an apprenticeship program (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 (Iowa New Jobs Training Program).
- **Developing regional workforce response teams** that can cater to unique conditions and energy opportunities within regions of a state (Oregon).

Examples of Some State Programs

State	Program Name	Web Site
California	Green Jobs Corp	http://www.californiavolunteers.org/index.php/GreenJobsCorps/
Iowa	Workforce Training and Economic Development Fund New Jobs Training Program	http://coolice.legis.state.ia.us/CoolICE/default.asp?Category=billinfo&Service=Billbook&frame=1&GA=82&hbill=HF927
Louisiana	Louisiana Clean Tech Network	http://www.lacleantech.net/
Maryland	Greener Jobs Initiative	http://www.governor.maryland.gov/speeches/090206.asp
New Mexico	Green Jobs Cabinet	http://www.governor.state.nm.us/press.php?id=1042
New Jersey	Green Job Training Partnership Program	http://lwd.dol.state.nj.us/labor/lwdhome/press/2009/022409_GreenJobTraining.html
New York	NYSERDA Workforce Training Initiative	http://www.powernaturally.org/
North Carolina	North Carolina Business Fund	http://www.ncleg.net/gascripts/BillLookUp/BillLookUp.pl?Session=2007&BillID=H1473
Oregon	Sustainable Oregon Workforce Initiative	http://www.worksourceoregon.org/index.php/component/docman/doc_details/734-analysis-of-clean-energy-workforce-needs-and-programs-in-oregon
Vermont	Vermont Sustainable Jobs Fund	http://www.vsjf.org/
Washington	Renewable Energy Apprenticeship	http://www.secstate.wa.gov/elections/initiatives/text/I937.pdf

Examples of Some Local Programs

City	Program Name	Web Site
Multiple Cities	Green-Collar Jobs in America's Cities: Building Pathways Out of Poverty and Careers in the Clean Energy Economy	http://www.apolloalliance.org/downloads/greencollarjobs.pdf
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
Oakland	Oakland Green Jobs Corps	http://www.ellabakercenter.org/index.php?p=gjgc_green_jobs_corps_gre%20enlight
Richmond	Richmond BUILD Pre-Apprenticeship Construction Skills and Solar Installation Training	http://www.ci.richmond.ca.us/index.asp?NID=1243
San Francisco	Center for Excellence's Solar Industry Workforce Environmental Scan	http://www.coecc.net/newsletters/COE_Silicon_Valley_SanFrancisco_March2008.htm

State Green Jobs Analyses / Action Plans

State	Report Name	Web Site
Colorado	Green Collar Jobs in the U.S. and Colorado	http://www.colorado.gov/energy/images/uploads/pdfs/GreenJobsReportFull.pdf
Connecticut	RE/EE Economy Baseline Study	www.ctcleanenergy.com/Portals/0/Phase%201%20Deliverable_Final%20Full.pdf
Minnesota	MN Green Jobs Task Force Draft Action Plan	www.mngreenjobs.com/
New York	Working Group VII – Workforce Training and Development Scope, Task, and Schedule	www.dps.state.ny.us/07M0548_Working_groups_phase2.htm
Oregon	An Analysis of Clean Energy Workforce Needs and Programs in Oregon	www.worksourceoregon.org/index.php/component/docman/doc_details/734-analysis-of-clean-energy-workforce-needs-and-programs-in-oregon
Tennessee	Growing Green: The Potential for Green Job Growth in Tennessee	www.state.tn.us/labor-wfd/Publications/EmploymentSecurity/GrowingGreenInTN2008.pdf
Washington	2008 Washington State Green Economy Jobs	energy.wsu.edu/documents/Green_Jobs_Report_2008.pdf

In progress:

Massachusetts: Report on clean energy sector of MA's economy

Vermont: Green business labor force analysis





Examples of State Legislation / Executive Orders

State	Legislation	Web Site
Colorado	Green Jobs Legislation (HB 1025), March 2008	http://www.leg.state.co.us/CLICS/CLICS2008A/csl.nsf/fsbillcont3/7DCA9D63A44957D08725737F00732CD3?Open&file=1025_enr.pdf
Connecticut	Green Jobs Executive Order (EO 23), Feb. 2009	http://www.ct.gov/Governorrell/cwp/view.asp?A=1719&Q=433292
Kentucky	Energy Technology Career Track Program (HB 2), April 2008	http://www.lrc.ky.gov/RECORD/08RS/HB2.htm
Maryland	Maryland Strategic Energy Investment Fund (HB 368), April 2008	http://mlis.state.md.us/2008rs/bills/hb/hb0368e.pdf
Massachusetts	Green Jobs Act (HB 5018), Sept. 2008	http://www.mass.gov/legis/bills/house/185/ht05pdf/ht05018.pdf
Michigan	Centers of Energy Excellence Program (SB 1380), July 2008	http://www.legislature.mi.gov/documents/2007-2008/publicact/pdf/2008-PA-0175.pdf
Minnesota	Green Jobs Task Force (SF 3096), May 2008	https://www.revisor.leg.state.mn.us/bin/bldbill.php?bill=S3096.3.html&session=ls85
New Mexico	Green Jobs Bonding Act (HB 622), April 2009	http://legis.state.nm.us/lcs/_session.aspx?Chamber=H&LegType=B&LegNo=622&year=09
Ohio	Edison Technology Center Program (SB 221), May 2008	http://www.legislature.state.oh.us/bills.cfm?ID=127_SB_221
Vermont	Green Jobs Legislation (HB 885), June 2008	http://www.leg.state.vt.us/docs/legdoc.cfm?URL=/docs/2008/acts/ACT182.HTM
Washington	Green Job Legislation (SB 6516), Jan. 2008	http://apps.leg.wa.gov/billinfo/summary.aspx?bill=6516&year=2007

Training Resources

EPA and Other

- **Residential Energy Efficiency Tradespeople**
 - **Residential Energy Efficiency Consumer Resources**
- **Commercial/Industrial Energy Efficiency Tradespeople**
- **Energy Efficiency Program Design Professionals**
- **Greenhouse Gas Inventory Specialists**

Non-EPA Residential Energy Efficiency Training Resources

- **Weatherization**

- Weatherization Assistance Program (WAP) Training Centers

www.waptac.org/sp.asp?mc=training_facilities

- BPI Training Affiliates

www.bpi.org/content/affiliates/affiliation-map.php

- **Home Energy Ratings**

- RESENT Training Providers

www.resnet.us/programs/training/default.htm

- **Regional and National Conferences**

- WAP, ACI, RESNET

ENERGY STAR Residential Energy Efficiency Training Opportunities

Home Performance with ENERGY STAR (existing homes)

- **Contractor Sales Training** – Free for Home Performance with ENERGY STAR partners
 - Contact vonSchrader.Chandler@epa.gov
- **National Symposium** – Annual meeting for program implementers and partners

ENERGY STAR HVAC Quality Installation Program

- **Technical Specifications Training** – Free for utility partners
 - Contact Leopkey.Ted@epa.gov

ENERGY STAR New Homes

- **Sales Training**
 - Contact Rashkin.Sam@epa.gov
- **Technical Specifications Training**
 - Contact Rashkin.Sam@epa.gov

ENERGY STAR Web-Based Consumer Energy Efficiency Tools

- ENERGY STAR @ Home
www.energystar.gov/home



- **Home Energy Yardstick** to compare home energy use



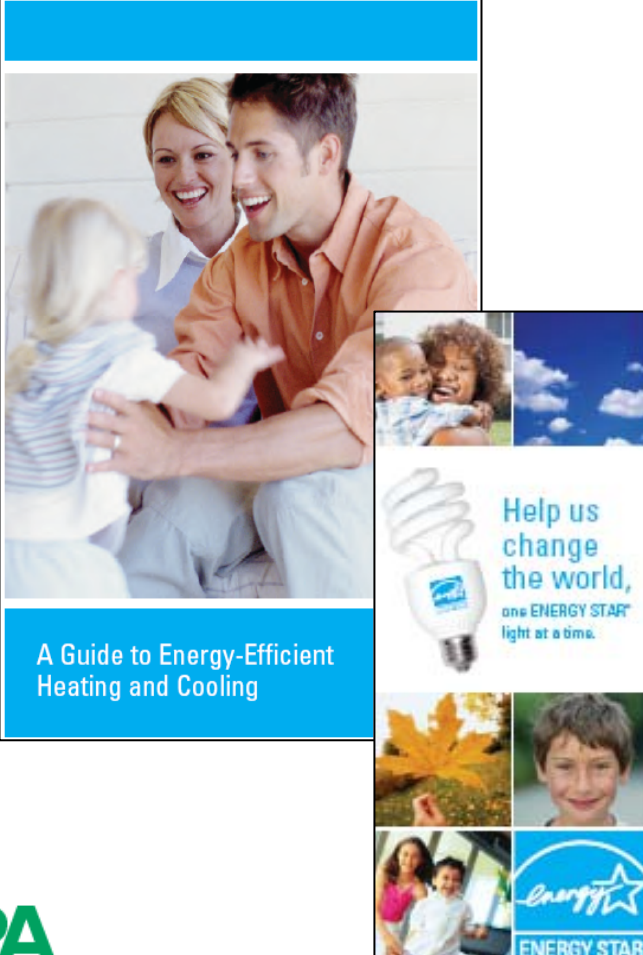
- **Home Energy Advisor** to get climate-specific home improvement recommendations



ENERGY STAR Consumer Energy Efficiency Publications

www.energystar.gov/publications


Residential Resources



A Guide to Energy-Efficient Heating and Cooling

Help us change the world, one ENERGY STAR light at a time.

ENERGY STAR

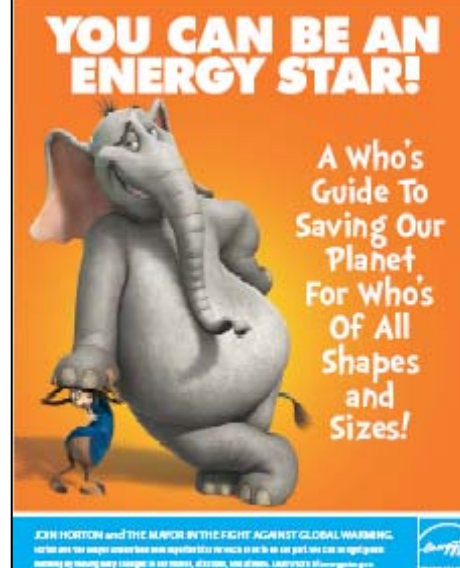


A DO-IT-YOURSELF GUIDE TO SEALING AND INSULATING WITH ENERGY STAR*

SEALING AIR LEAKS AND ADDING ATTIC INSULATION

ENERGY STAR

Educational Resources



YOU CAN BE AN ENERGY STAR!

A Who's Guide To Saving Our Planet For Who's Of All Shapes and Sizes!

JEN HORTON and THE MAJOR IN THE FIGHT AGAINST GLOBAL WARMING

ENERGY STAR

ENERGY STAR Commercial Buildings Energy Tools/Communication Resources

- **Portfolio Manager** – assess / track energy performance in commercial buildings
<http://www.energystar.gov/benchmark>
- **Benchmarking Starter Kit** – understand what you'll need
http://www.energystar.gov/index.cfm?c=comm_real_estate.bus_comm_realestate_bm_starter_kit
- **Target Finder** – set aggressive, realistic energy targets
<http://www.energystar.gov/targetfinder>
- **Communications Toolkit** – use ready materials for outreach
<http://www.energystar.gov/challenge> (see toolkit)
- **More Tools** – including Financial Evaluation Calculators
http://www.energystar.gov/index.cfm?c=tools_resources.bus_energy_management_tools_resources

ENERGY STAR Commercial / Industrial Energy Efficiency On-line Training Center

www.energystar.gov/training

- **Retail** Sale Associate and Manager training
- **Utility** Best Practices
- **Buildings** and Plants (Commercial, Government, Schools, Industrial)
 - Webinars have included:
 - Building Energy Benchmarking with Portfolio Manager
 - Energy Star for Industrial Sector
 - Setting New Construction Energy Goals with Target Finder
 - Purchasing and Procuring Efficient Equipment
 - Best Practices to Improve Energy Performance
- **Energy Management Program Development**
 - How to establish an energy management program
 - **Guidelines for Energy Management:**
www.energystar.gov/guidelines
 - How to measure building energy performance
 - **Benchmarking Starter Kit:**
http://www.energystar.gov/index.cfm?c=comm_real_estate.bus_com_m_realestate_bm_starter_kit

Non-EPA Training Resources for Energy Efficiency Design Professionals

- **National Association of Regulatory Utility Commissioners (NARUC)** – conferences, reports
www.naruc.org
- **Edison Electric Institute (EEI)** – initiatives, case studies, reports
www.eei.org/OURISSUES/ENERGYEFFICIENCY/Pages/default.aspx
- **Institute for Electricity Efficiency (IEE)** – issue briefs, databases, technical support
www.edisonfoundation.net/iee/
- **Association for Electricity Service Professionals (AESP)** – brownbags, conferences, regional trainings
www.aesp.org
- **National Governors' Association (NGA)** – Center for Best Practices Learning Networks
www.nga.org/center
- **New England Clean Energy Council** – Clean Energy Fellowship Program for Entrepreneurs
www.cleanenergycouncil.org/foundation/fellowship

EPA State Energy / Utility Commission Professional Training Resources

- **National Action Plan for Energy Efficiency**

www.epa.gov/eeactionplan

- Educates state utility regulators and staff on energy efficiency policy options
- Provides direct technical assistance, issue papers, tools, and outreach presentations to help parties achieve all cost-effective energy efficiency by 2025
- *Education priorities for 2009: energy efficiency program evaluation; cost-effectiveness tests; utility incentive policies*

- **Combined Heat and Power (CHP) Partnership**

www.epa.gov/chp

- Shares information on policy options to remove barriers to CHP
- Provides direct technical assistance to state utility commissions



Summary of National Action Plan Educational Resources

	Technical Assistance	Existing Papers	Work Underway
1: Establishing Cost-Effective Efficiency as a High-Priority Resource	X	X	
2: Developing Processes to Align Utilities Incentives Equally for Efficiency & Supply Resources	X	X	
3: Establishing Cost-Effectiveness Tests	X	X	
4: Establishing EM&V Mechanisms	X	X	
5: Establishing Effective EE Delivery Mechanisms	X		X
6: Developing Related State Policies	X	X	X
7: Aligning Customer Pricing and Incentives	X		X
8: Establishing State of the Art Billing Systems	X	X	
9: State of the Art Information Sharing & Delivery Systems			X
10: Implementing Advanced Technologies			X
Related state and regional policies (GHG)			X

EPA State and Local Energy Professional Training Resources

- **State and Local Climate and Energy Program**
www.epa.gov/cleanenergy/stateandlocal
 - **State Technical Forum Webcasts**
www.epa.gov/cleanenergy/energy-programs/state-and-local/state-forum.html
 - monthly facilitated discussion among state energy, environmental, and public utility commission officials
 - peer exchange, expert presentations, targeted background documents on > 30 topics
 - **Local Government Best Practices Webcasts**
www.epa.gov/cleanenergy/energy-programs/state-and-local/webcast.html
 - **State Guidance Documents**
www.epa.gov/cleanenergy/energy-programs/state-and-local/by-topic/policy.html
 - Clean Energy Funds Manual
 - Supplemental Environmental Projects Toolkit
 - Clean Energy-Environment Guide to Action: Policies, Best Practices, and Action Steps for States
 - Lead by Example Guidebook

EPA / DOE Rapid Deployment Energy Efficiency (RDEE) Toolkit

http://www.epa.gov/cleanenergy/energy-resources/ee_toolkit.html

- **Supports state/local energy efficiency efforts** during economic stimulus spending
- **Residential and commercial sector topics** across 10 program areas:
 - ENERGY STAR labeled products, Energy Audits, Home Performance with ENERGY STAR, Efficient HVAC, Prescriptive, Benchmarking and Performance, Custom, Retro-commissioning, On-Site Energy Manager, ENERGY STAR Commercial Food Service
- **Planning Guide available** – includes 4-5 pp. snapshot for each program:
 - **Program Summary**
 - **Target Market**
 - **Monitoring & Verification (M&V)**
 - **Staffing Requirements and Job Creation**
 - **Implementation Timeline**
 - **Savings and Other Key Metrics**
 - **Links to Resources and Assistance**
- **Complete Toolkit** (released May/June 2009) – will include more planning and implementation resources for each program (e.g., contract language, training plans, *training materials*, M&V plans)
- **Technical Assistance**
 - Training and technical assistance available to help parties implement programs of interest as program guides are released.
 - Training and ongoing technical assistance provided by experts in energy efficiency program design and implementation.

EPA GHG Inventory Training

Recorded Webcasts

http://www.epa.gov/climatechange/emissions/state_guidance.html#training

In Fall 2007, EPA offered a series of Webcasts to aid local, regional, and state governments in creating greenhouse gas inventories.

- **First Session: Creating an Inventory**

- Topics include: understanding the purpose and scope of a GHG inventory, inventories vs. registries, setting a boundary, setting a baseline, quantification approaches, certification and reporting protocols, comparability, and level of effort.

- **Second Session: Translating Inventory Results into Action**

- Topics include: describing the various uses of GHG inventories, including benchmarking, tracking emissions and progress over time, setting emission reduction goals, policy options for meeting goals, evaluating policy options, and processes for setting goals and policies.

- **Third Session: State Inventory Tool (SIT) Training Session**

- Topics include: background information on the development of the SIT modules and a live demonstration of the CO₂ from Fossil Fuel Combustion Module, Natural Gas and Oil Module, Synthesis Module, and Projection Tool.

Looking Ahead

- All ARRA 2009 grants will track number of jobs created and maintained
- Council of Economic Advisors is working to develop an assessment methodology
- EPA is developing a fact sheet on using federal funding to develop green workforce training programs

More Information

State Technical Forum Clean Energy Workforce Development Webcast:

background paper, resources, PPTs

www.epa.gov/cleanenergy/energy-programs/state-and-local/state-forum.html#twoa

All EPA Climate Protection Partnership Division Programs:

www.epa.gov/cpd

www.energystar.gov

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www.epa.gov/cleanenergy/stateandlocal

