



Energy Efficiency & Retrofit Jobs in the Buildings Industry - Workforce Overview

August 27, 2009

Energy Efficiency & Retrofit Jobs in the Buildings Industry - Workforce Overview Webinar will cover:

- Overview of energy efficiency and retrofit jobs;
- Job skills and scaling up training;
- Partnering between community colleges and workforce agencies;
- Overview of training and certification;
- State and local workforce practices; and
- Questions and answers.

- Department of Energy – Building Technologies Program
 - Responsible for researching technologies and strategies that improve the efficiency of buildings; and
- Department of Labor – Employment & Training Administration's Office of Workforce Investment
 - Serves America's workers and employers by creating partnerships between the state and local workforce investment system.

- Michael McCabe – Senior Engineer, DOE Building Technologies Program, Washington, D.C.
- Dr. Jennifer Troke – Team Leader, DOL Office of Workforce Investment
- Charles Segerstrom – Manager, Energy Centers, Pacific Gas and Electric Company, California
- Dr. Debra Rowe – Professor, Sustainable Energies & Behavioral Sciences, Oakland Community College, Michigan and President, U.S. Partnership for Education for Sustainable Development
- Dr. Jerry Weber – President, College of Lake County, Illinois, representing the Illinois Community College Sustainability Network

- **In 2006:**
 - The U.S. had approximately 113 million residential buildings;
 - Residential buildings account for:
 - 21% of primary energy consumption;
 - 37% of electricity consumption; and
 - 20% of carbon dioxide emissions
 - \$225.6 billion was spent on energy for residences; and
 - 59% of residential buildings were built in 1979 or before.
- **By 2020:**
 - Residential buildings built before 1995 will use approximately 70% of all energy consumed in residential buildings.

Sources: DOE Building Technologies Program's [2008 Buildings Energy Data Book](#); and Pacific Northwest National Laboratory Analyses

What are the advantages of home retrofits?

- **For every \$1 invested, retrofitting a home returns \$2.73 in benefits**
 - \$1.67 in energy-related benefits; and
 - \$1.06 in other benefits such as reducing pollution, unemployment, and adverse health concerns.
- Families can save approximately \$350 or more annually on energy bills after retrofitting.

Source: Weatherization and Intergovernmental Program Fact Sheet wip.energy.gov/pdfs/wip_factsheet.pdf

- Managed by the U.S. Department of Energy and the U.S. Environmental Protection Agency
- Sponsors such as utilities, states, and local governments implement Home Performance with ENERGY STAR (HPwES)
- With HPwES, homeowner gets a whole house approach:
 - Energy audit
 - Efficiency measures implemented with a target of 20-30% energy savings
 - Final testing and quality check
- Some sponsors offer financial incentives for homeowners

http://www.energystar.gov/ia/home_improvement/HPwES_Utility_Intro_FactSheet.pdf

- HPwES is active in the following states:

Arizona	Massachusetts	Ohio
California	Maryland	Oregon
Colorado	Maine	Pennsylvania
Delaware	Minnesota	Rhode Island
Florida	Missouri	Texas
Georgia	North Carolina	Vermont
Idaho	New Jersey	Wisconsin
Illinois	New York	Wyoming

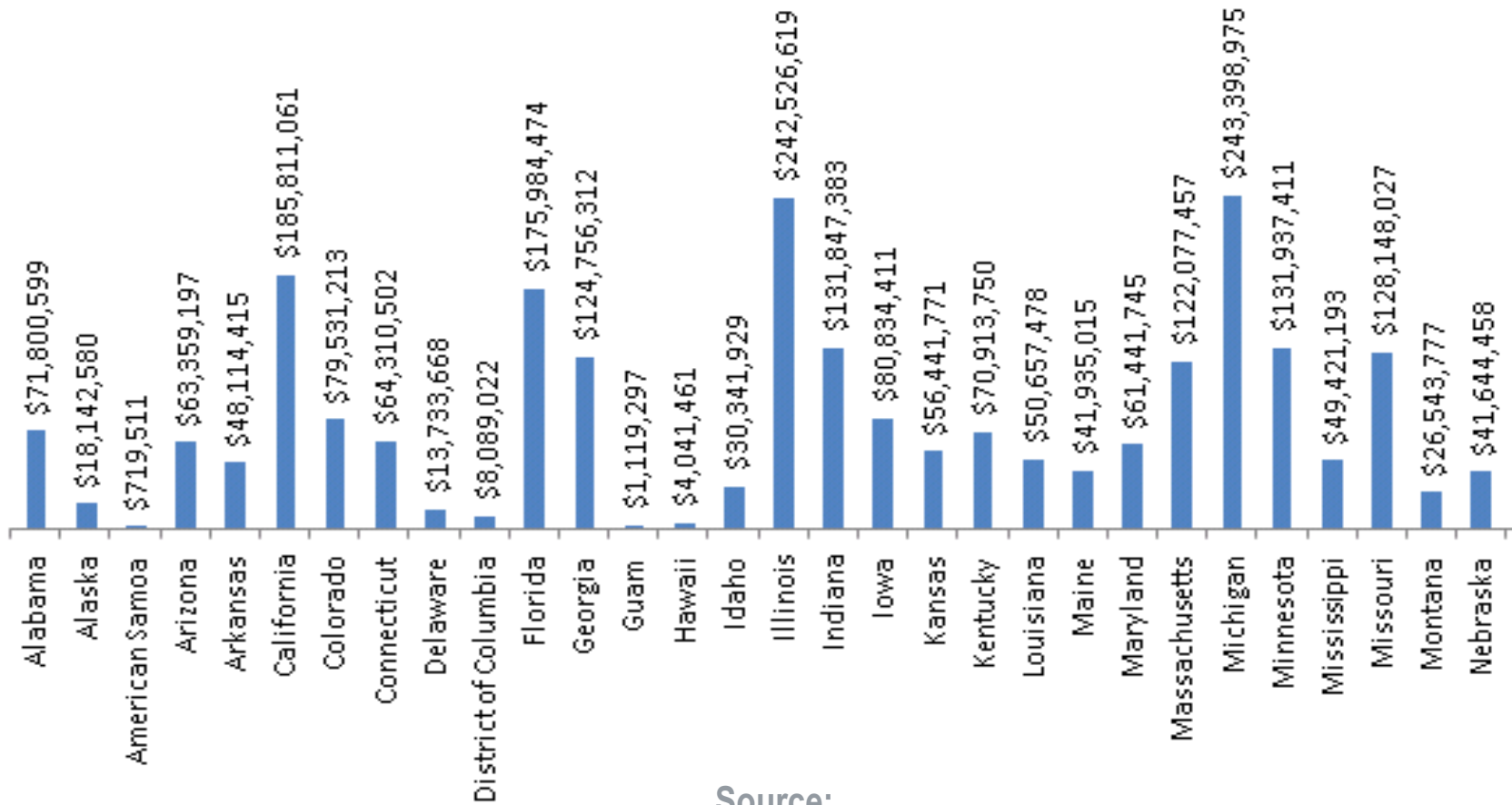
- Learn more:
http://www.energystar.gov/index.cfm?c=home_improvement.hm_improvement_hpwes_partners

- DOE's Building Technologies Program residential building research goal is to achieve affordable Net Zero Buildings (ZEB) by 2020 (www.buildings.energy.gov);
- ZEB research informs measures taken by DOE's Weatherization Assistance Program (WAP);
- WAP received an additional \$5 billion in funding under the American Recovery and Reinvestment Act (ARRA) of 2009 (www.weatherization.energy.gov/recovery_act.cfm)

- Zero Energy Commercial Buildings
 - Half of the budget for the National Accounts industry-partner effort is dedicated to retrofits, with members such as Walmart and McDonalds committing to at least a 30% savings in retrofitted buildings;
 - Launching a Higher Education Energy Alliance, which will offer DOE expertise in the context of peer to peer exchanges between higher education institutions, including community colleges; and
 - Conducting research on the energy uses of commercial buildings to develop the next generation of technologies, most of which can be used in existing buildings.

- Zero Energy Residential Buildings - Building America
 - Solicitation is out to identify research teams that will partner with industry to identify the most effective means to improve the efficiency of existing homes;
 - The research teams will determine cost-effective system-based deep energy retrofit packages for different climates and house vintages; and
 - Focusing on homes that are of an age where systems are naturally wearing out and are ready for replacement and in regions prone to natural disasters.

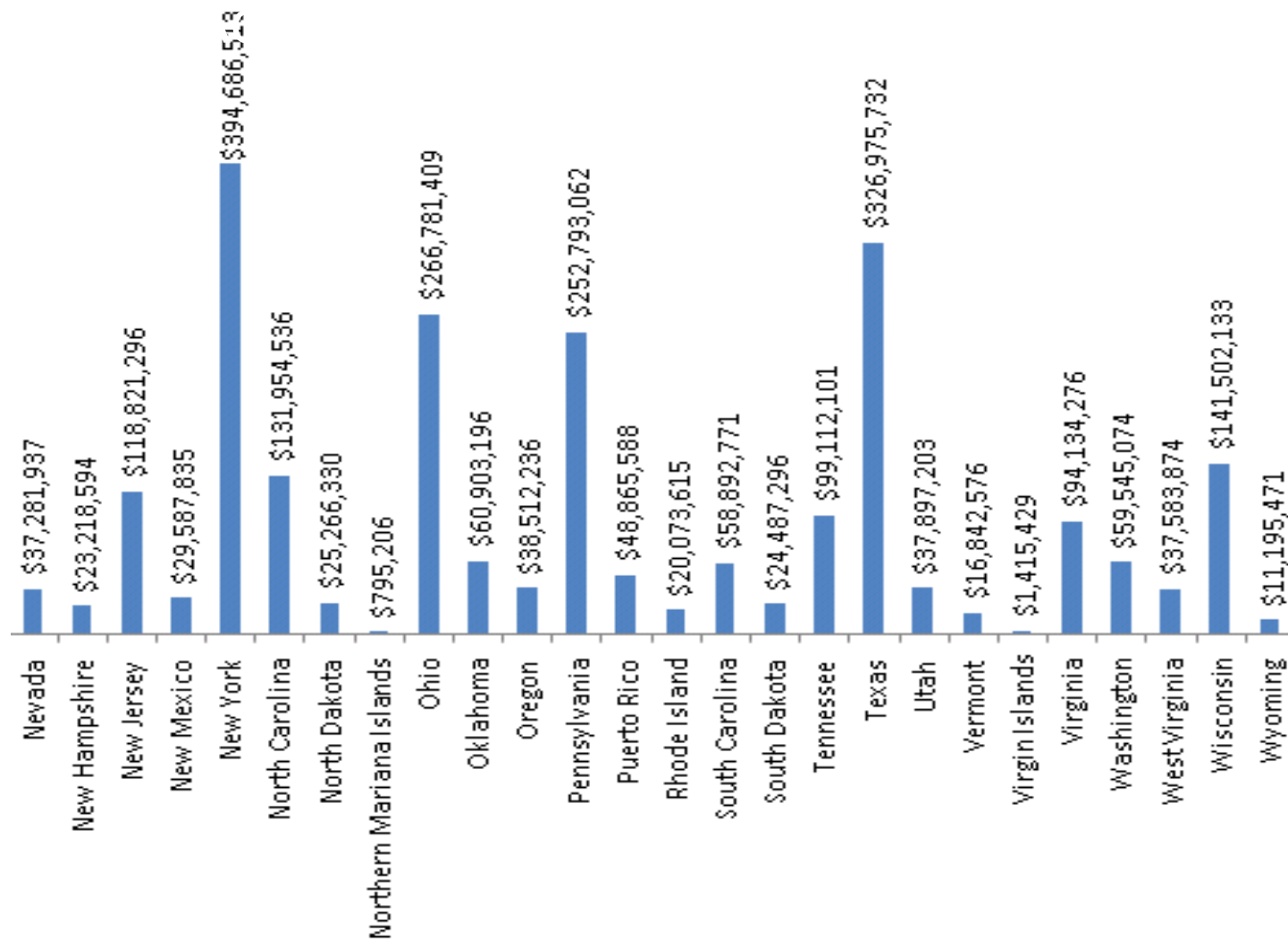
WAP ARRA Funding by State



Source:

www.weatherization.energy.gov/recovery_act.cfm

WAP ARRA Funding by State



Today is a chance to learn more about the programs and jobs available in making homes more energy efficient and how your organizations can support the workers you serve.

August, 2009

Energy Efficiency & Retrofit Jobs in the Buildings Industry- **Workforce Overview**

Charles Segerstrom
Pacific Gas and Electric Company
Manager, Energy Centers



Energy Efficiency Workforce Education and Training?

Who

Re-training: Out-of-Work Contractors

Pre-Apprenticeship: Entry Level Job Skills

Energy Efficiency Workforce Education and Training?

What

Categories of Energy Efficiency Green Jobs

- Building Performance Retrofit Specialists,
- Energy Auditors/Home Raters,
- Resource Conservation or Energy Efficiency Managers,
- Project Managers,
- Building Controls Technicians,
- HVAC Technicians and Installers,
- Compliance Analysts

Certification Categories:

- BPI
- NATE
- HERS (RESNET, CEC HERSII)

Energy Efficiency Workforce Education and Training?

When

Timing of Municipal ARRA Programs and Content

- Carrots? Energy Bill Incentives?
- Sticks? Codes and Standards?
- Financing?
- Audits on Resale? With Retrofits Required?

Energy Efficiency Workforce Education and Training?

Where

Existing Energy Centers with Transition to the Core Education System

- PG&E's Energy Training Center-Stockton
 - 31 Years of Training Partnership
 - State Weatherization Training
 - 392 Classes for 5025 People
- Classroom and Laboratories
 - 3000 square foot Training House
 - 1500 square foot HVAC Lab
 - 1500 square foot Weatherization Lab

Energy Efficiency Workforce Education and Training?

How

ARRA Funding Jump Start

- Articulation with Community Colleges and Workforce Investment Boards
- i.e., California WE&T Program for Energy Efficiency is aiming to be the largest in the U.S. at over \$70 million

Energy Efficiency Workforce Education and Training?

Why

Urgency of Climate Change Action Plans

Sustainable Jobs that Can't be Outsourced

**Economic Development and New Green
Economy**

Over 112 Million Homes to Upgrade

Green Jobs Career Pathways

A Bridge to Somewhere!

Outreach, Recruitment and Assessment

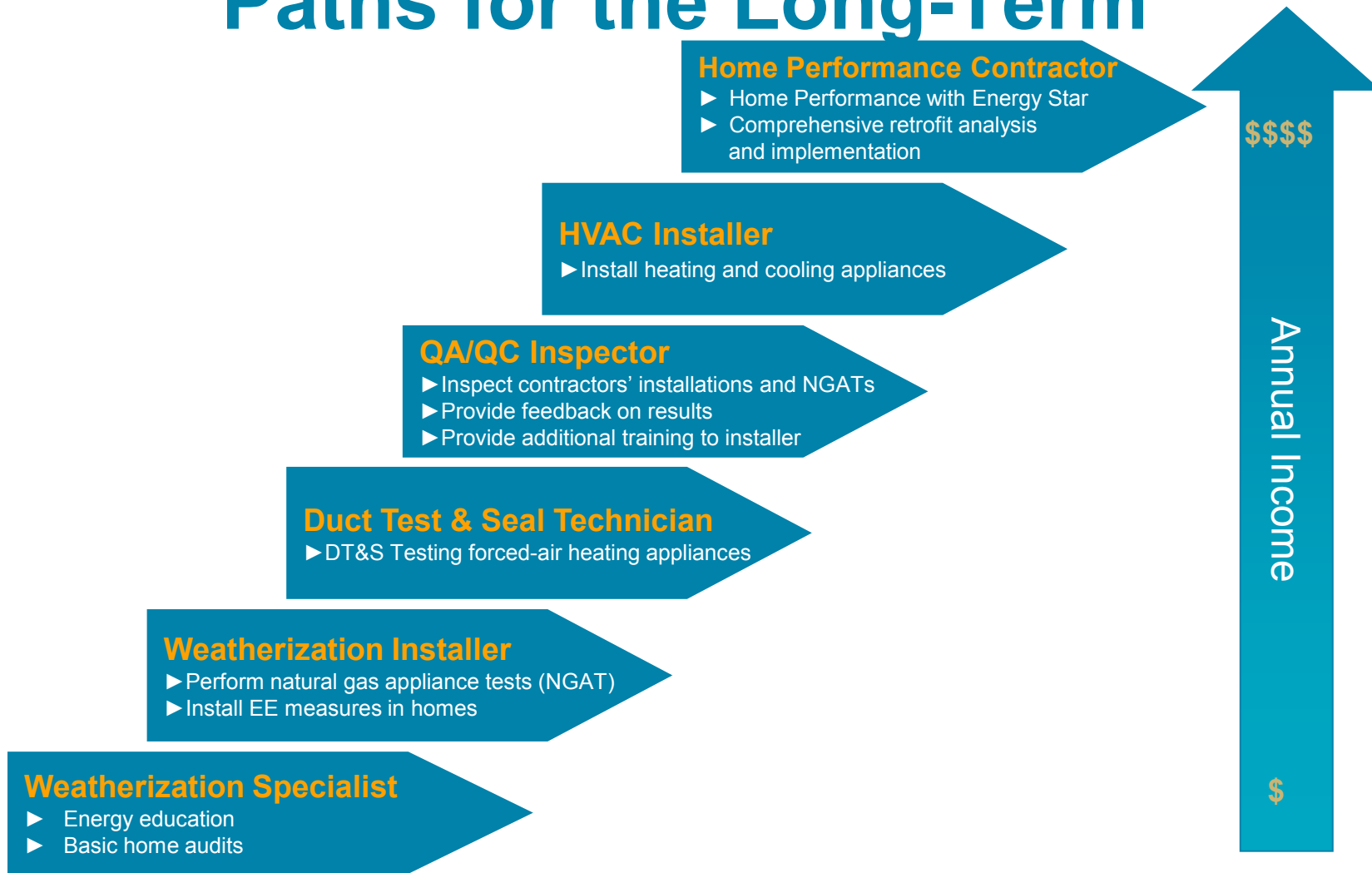
Pre-Bridge Literacy and Math Training

**Bridge to Green Construction, Solar,
Environmental Careers**

Bridge to Professional Career Preparation

Relevant to Next Generation

Creating Meaningful Career Paths for the Long-Term





PG&E Green Jobs Career Pathways

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Residential Retrofit Job Skills

Workforce Entry Basics

Energy Efficiency Fundamentals

Weatherization

Competencies

- Hands-On
- Safety

New Construction and/or Retrofit

Residential Retrofit Job Skills

Home Performance

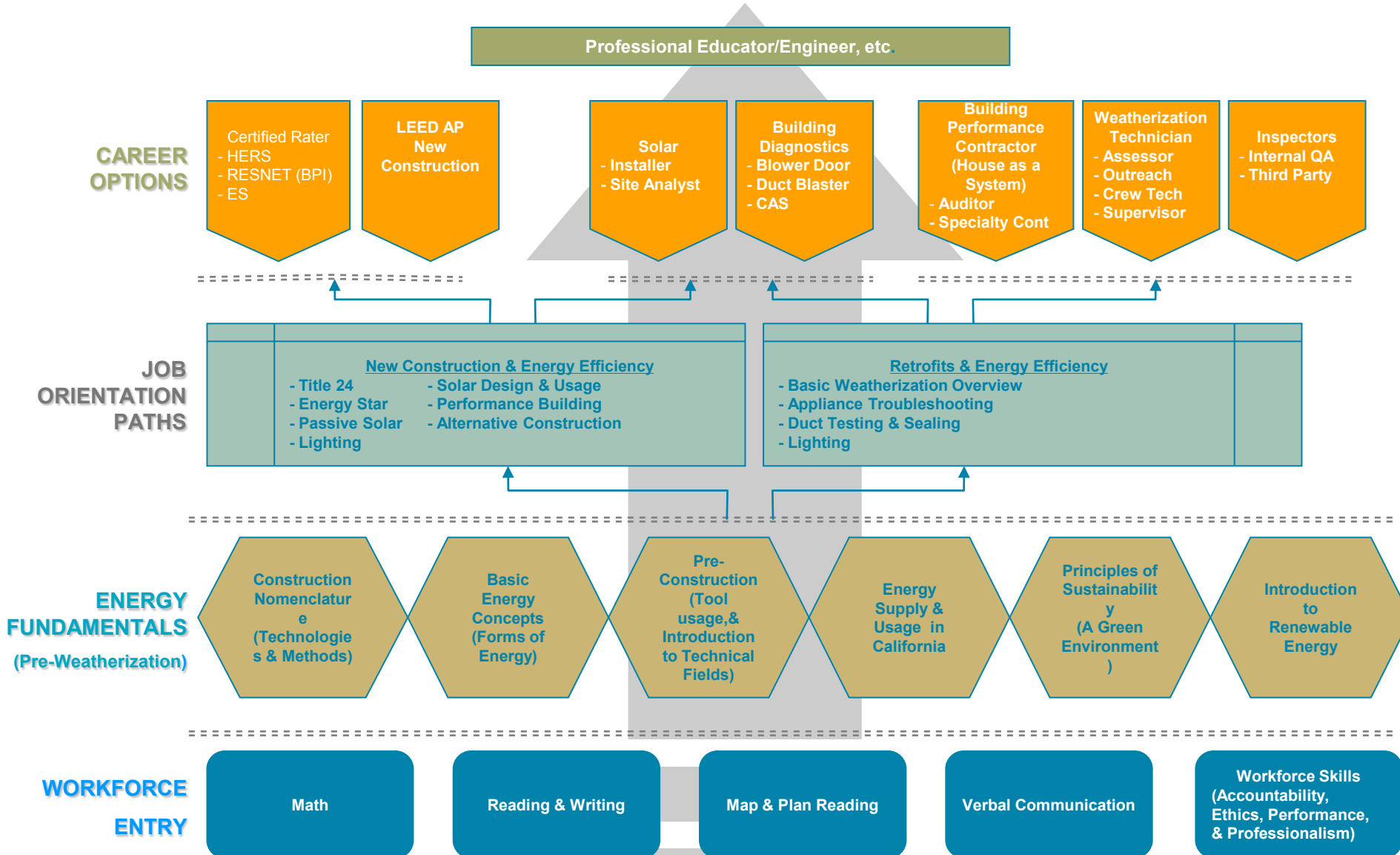
- Concepts in Comprehensive Home Performance
- Building Science, House As A System, Benefits

Career Options:

- Raters/ Auditors
- Building Performance Diagnostician
- Installation Contractor
- Inspectors

Residential Training Paths

Source: Richard Heath and Associates; Chico, CA



Workforce Entry Fundamentals

Source: Richard Heath and Associates; Chico, CA

Math

Dealing with Math Anxiety
Whole Numbers (Integers)
Fractions
Decimals
Introduction to Basic Algebra
• Addition
• Subtraction
• Multiplication
• Division
• Operations Sequencing
• Powers and Exponents
Workplace Math
• Measuring
• Calculating Distances, Areas, Volumes
• Calculations and Time
Using Calculators
Computers and Math
Introduction to Math in Trades
• Energy and Math
• Mechanical Trades
• Structural Trades
• Finish Trades
• Math and Computers

Reading & Writing

Reading and Writing Assessments
Remedial Reading Course
Remedial Writing Course
ESOL Pre-Literacy courses
ESOL Literacy courses
Basic Grammar
Reading/writing Instructions
Reading basic technical information
Completing Forms
Writing Basic Communications
Keyboarding Skills
Employment Applications

Map & Plan Reading

Introduction to Plans and Maps
Understanding Map Symbols and Scale
Map and Plan Reading
Fundamentals
Map Reading Lab
Introduction to Building Plans
Building Plan Structure and Layout
Architectural and Engineering symbols and Scales
Plan symbols and abbreviations
Reading Basic Floor Plans, Elevations and Details
Introduction to Specifications

Verbal Communication

Basic Communication Skills
Understanding Verbal Communication Skills
Developing Listening Skills
Appropriate Workplace Topics
Non Verbal Communication
Communicating Expectations
Being a Team Player
Speaking with Respect

Workforce Skills (Accountability, Ethics, Performance, & Professionalism)

Time Management and Punctuality
Dressing For Success
Understanding Your Role
Workplace Responsibility and Accountability
Workplace Behavior and Ethics
Cultural Tolerance and Respect
Understanding Sexual Harassment: Your rights and Responsibilities
Moving Up (How to succeed through performance)
Introduction to Professionalism and Customer Interaction

Energy Fundamentals/Preweatherization

Source: Richard Heath and Associates; Chico, CA

Construction Nomenclature (Technologies & Methods)	Basic Energy Concepts (Forms of Energy)	Pre-Construction (Tool usage, & Introduction to Technical Fields)	Energy Supply & Usage in California	Principles of Sustainability (A Green Environment)	Introduction to Renewable Energy
<p>Residential Construction</p> <p>Occupancy Types</p> <p>Residential Construction Methods</p> <p>History of Construction Practices</p> <p>Introduction to Methods and Materials in Structural Assemblies (Existing and New)</p> <p>Introduction to Methods and Materials in Systems (Existing and New)</p> <p>Introduction to Methods and Materials in Finishes (Existing and New)</p> <p>Overview of Primary and Secondary Trades in Construction (New Construction and Renovation)</p>	<p>Definitions of Energy</p> <p>Forms of Energy</p> <p>Laws of Energy</p> <p>Principles of Energy Conversion</p> <p>Introduction to Heat and Temperature</p> <p>Energy and Comfort</p> <p>Sources of Energy</p> <p>Introduction to Energy Transformation and Transport</p> <p>Energy End Uses in Residential Buildings</p> <p>Energy Conversions in Building Systems</p> <p>Heat Gain, Heat Loss Basics</p> <p>Energy Use and the Building Shell</p> <p>Energy Properties of Building Materials</p>	<p>Residential Construction Trades</p> <p>Principles of Safety in Tool Usage</p> <p>Ergonomics and Physical Skills</p> <p>Tool Categories</p> <p>Tool Types and Tasks</p> <p>By Construction Trade</p> <p>Hand Tools Lab</p> <p>Small Power Tools Lab</p> <p>Tool Care and Maintenance</p> <p>Large Power Tools and Heavy Equipment Overview</p> <p>Field Instruction and Practice for Basic Skills (Cutting, Drilling, Measuring etc.)</p> <p>Structural Framing Overview</p> <p>Building Shell Overview</p> <p>Mechanical Systems Overview</p> <p>Electrical Systems Overview</p> <p>Plumbing Systems Overview</p> <p>Interior and Exterior Finishes Overview</p>	<p>Review of Energy Principles</p> <p>Fuel Sources and Energy Transformation Overview</p> <p>Energy Production and Climate Change</p> <p>The Energy Grid (Electricity)</p> <p>The Energy Grid (Natural Gas, Propane, Fuel Oil)</p> <p>From Source to Appliance</p> <p>Introduction to Utility Companies</p> <p>Energy Outlook (Supply Versus Demand)</p> <p>Understanding Utility Bills</p> <p>Introduction to Energy Cost Analysis</p> <p>Introduction to Energy Efficiency and Conservation Principles</p> <p>Primary Energy Demand Reduction Opportunities</p>	<p>Introduction to Sustainability Principles (Pillars) of Sustainability</p> <p>Understanding Natural Cycles and Industrial Cycles</p> <p>Climate Change 101</p> <p>Sustainability in Daily Life</p> <p>Conventional Versus Sustainable Development</p> <p>Principles of Green Building</p> <ul style="list-style-type: none"> •Energy Efficiency •Water Conservation •Indoor Environment •Resource Efficiency •Livable Communities •Sustainability and Existing Buildings 	<p>Conventional Energy Sources</p> <p>Renewable Energy Sources</p> <p>Understanding Supply and Demand Issues</p> <p>Types of Renewable Energy Systems</p> <p>Fundamentals of Solar Energy Production</p> <p>Photovoltaic and System Types</p> <p>Solar Thermal and Thermal Storage</p> <p>Wind Energy Systems</p> <p>Fuel Cell, Biomass and other Innovative Energy Sources</p> <p>Renewable Energy Jobs and Trade Skills</p>

Articulation With Existing Programs

Centralized vs. De-Centralized Training

- When can a “tipping point” be determined?
- Cost of classrooms vs. dedicated laboratories.

Knowledge Based Training vs. Hands-On

- Making the marriage
- Need for “tactile learning” for this audience

Energy Training Center- Stockton Full Scale Hands-On Training



HVAC Lab



PG&E Education and Training:

HVAC Quality Installation



Energy Efficiency Education & Training Programs



Energy efficiency classes

- Offered free throughout PG&E service area and by SCE (AgTAC) & Sempra

Tool Lending Library

- Loans building measurement equipment for energy analysis

Private Consultations

- Advise building professionals on energy-efficient design

Have trained more than 500,000 people since 1978

*Analysis of an architectural model using the **heliodon**, which simulates sunlight penetration and shading at different times of day and during different seasons*

Scaling-up Building Retrofit Training

Tipping Point Considerations

- Travel and Lodging

The Role of On-Line Learning

Program Needs for Standardization

- Policies and Procedures
- Forms and Database Reporting
- Safety Elements

Needs Assessment

Chicken and Egg Issues: Supply of Workers vs. Demand

Matching Training to Expected “non-subsidized” placements

California Grant Performance Expectations

- **100% Placed in Education and Training**
- **80% Completed Training**
- **70% Attained Recognized Certificate**
- **73% Placement in Unsubsidized Job**
- **81% Retained Employment (6 months)**

Great Work Being Done!

- **CCC Centers of Excellence Studies**
- **LBNL**

Key Findings, 2009

Energy Efficiency Occupations in the Bay Region

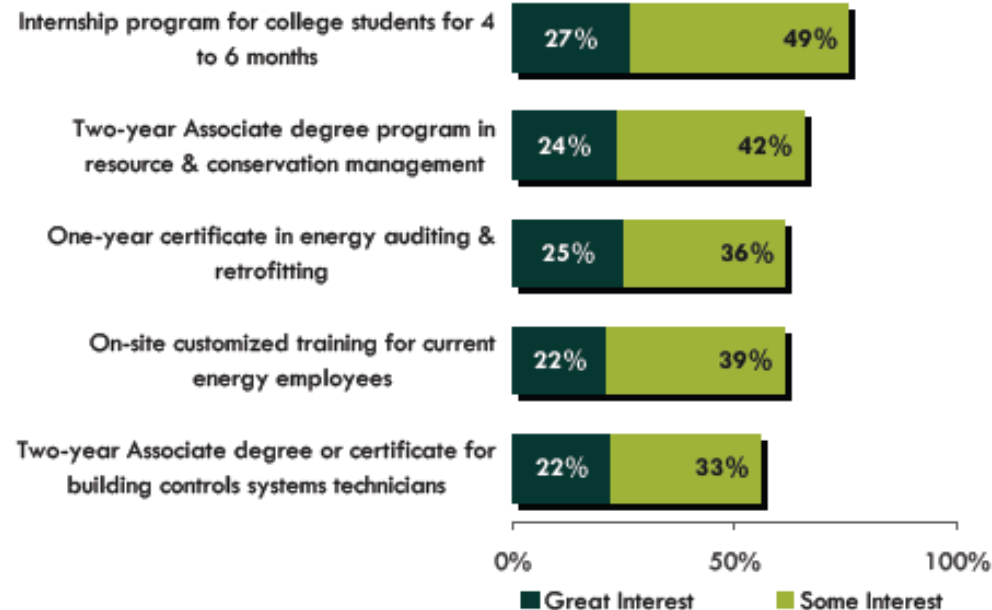


Centers of Excellence
Economic and Workforce Development
California Community Colleges

Employers' Top 3 Most Important Knowledge and Skill Areas

1. Ability to communicate with customers, in writing and in person.
2. Understanding of local and state energy efficiency requirements and incentives for new and existing buildings.
3. General understanding of the mechanics and engineering of energy systems, including HVAC, lighting, and renewable energy systems.

Employer Interest in Community College Programs



Shown with permission from

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Centers of Excellence, Economic and Workforce Development Program

Occupational Employment

Energy Efficiency Occupations	Estimated 2008 Employment	3-year Projected	Growth Rate
Project managers for construction or design work are responsible for communicating with project partners and ensuring that the project is completed in a timely manner and within budget.	10,630	2,850	27%
Building performance or retrofitting specialists are contractors who improve the energy efficiency of homes or buildings by installing insulation, windows, lighting and other energy efficient products.	4,630	2,690	58%
HVAC mechanics, technicians or installers install, repair and maintain heating, ventilation, air-conditioning and refrigeration systems.	5,250	1,630	31%
Energy auditors or home energy raters are responsible for collecting, analyzing and validating energy usage in the field and preparing reports on a building or home's total energy profile.	2,980	1,470	49%
Resource conservation or energy efficiency managers assess current energy and resource consumption and develop strategies to reduce usage.	3,080	1,400	45%
Building controls systems technician combine some of the traditional skill sets of building technicians with advanced skills in controls programming, networking, and systems integration.	2,790	1,160	42%
Compliance analyst or energy regulation specialists evaluate if projects are meeting regulatory requirements and/or incentives and provide recommendations as needed to meet compliance.	2,000	1,190	59%
Building operators or building engineers troubleshoot, install, replace, and repair building energy systems and controls to optimize energy efficiency.	3,280	710	22%
Total, All Occupations (totals may not add due to rounding)	34,640	13,090	

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Green Economy Transition from Fringe to Core

Some Said it Would Take 10-15 Years

What an Opportunity a Crisis Brings...

Programs Have “Quietly” Existed for 30 years

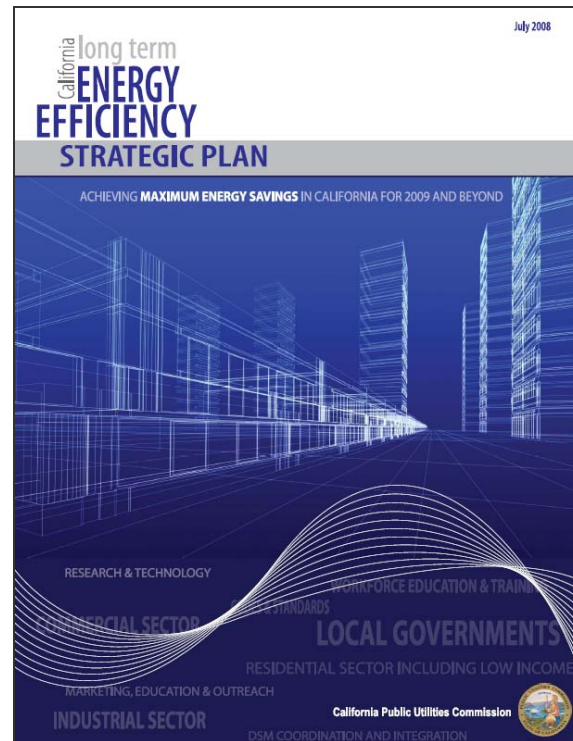
Career Ladder from Subsidized



California Long-Term Energy Efficiency Strategic Plan

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(Final - July 2008)



Support Community Colleges to Develop Their Education Based on Visible Career Paths in Energy Efficiency and Related Fields

- Technical Training:
 - HVAC
 - Building Operator Certification

Career Laddering Considers Energy-Related Jobs

Green Economy Transition from Fringe to Core

Weatherization to Market-Based Retrofits

- **Requires Carrots and Sticks**

**Training for Trainers, Mentoring, Facility
Development**

MATCH JOB TRAINING TO JOB OPENINGS



The Time to Act is NOW!²⁸

Thanks!

Charles Segerstrom
cfs1@pge.com





Debra Rowe

1. A few additional comments on types of green jobs
2. Examples of success stories
3. Informational Resources
4. Certifications: what they are and how to consider them



Other successful partnerships – Creating the green economy and real career pathways

Outreach to potential employers to educate them about green opportunities and THEN educate their existing and new employees – partner with Workforce Agencies to anticipate and **catalyze green business development. Combine this with new business models. Examples:**

- Seminars on how to green and expand your business – for building trades associations, Chambers of Commerce...
- Los Angeles Community College District – 100% conservation and solar **with community purchasing**
- Solar Richmond – city solar with investors/ hiring commitments
- Old Tennessee Valley Authority Model – convenience, credibility, positive cash flow for customers = robust market



Trends and Educator Resources for green technician education - continued

- Green for All - Pathways out of poverty programs
- Sample of Career Pathways – (Ohio) -
- American Association of Community Colleges – www.aacc.nche.org/sustainable



Trends and Educator Resources for green technician education

- National Council for Workforce Education – examples at colleges <http://www.ncwe.org/documents/GoingGreen.pdf>
- Interstate Renewable Energy Council (IREC) – training and best practices www.irecusa.org
- Advanced Technology Environmental and Energy Center – NSF funded www.ateec.org
- Consortium for Education in Renewable Energy Technology (CERET) – www.ceret.us - also NSF funded, online for faculty development, remote students and pass-through degrees



Another word about green jobs: the obvious choices

Traditional community college, vocational education, and
National Science Foundation Focus on Technicians

- Energy Auditor
- Wind energy technician
- Insulation and Weatherization Technician
- Photovoltaics (solar electricity) installer
- Thermal Solar Installer (hot water and space heating and pool heating)



Upstream green jobs: the other jobs needed so technicians get employed

- Energy Efficiency/Green Materials and Renewable Energy Products Financiers and Manufacturers and Distributors and Salespeople
- Energy Policy Analyst and Legislators
- Employee in state and local energy related offices
- HVAC and other types of contractors with energy efficiency and renewables expertise/product line
- Energy Service Company (ESCO)
- Corporate Social Responsibility Officer
- Sustainability Oriented Purchasing Agent and Business VP
- Energy Manager
- Facilities Director



The Pervasiveness of Green – don't forget the bigger picture

- I could list many more pages of job titles
- SOC listings are incomplete
- Every job will have a green tinge to it, since energy and natural resource waste will be costly and unacceptable
- Many of those jobs will be available to community college graduates
- To create market demand, educate all students as consumers and investors and some as workers



Make changes in all academic areas - Disciplinary Associations Network for Sustainability – www.aashe.org/dans

- American Psychological Association
- Sociology
- Religion
- Philosophy
- Math
- Broadcasting
- Architecture
- Engineering (civil, mechanical, eng. ed.)
- Business
- Ecological Economics
- Chemistry
- Biology
- American Association for the Advancement of Science
- Computer Research
- Humanities
- Women's Studies
- Political Science
- Anthropology
- More...



Association for the Advancement of Sustainability in Higher Education

AASHE

(AY-shee)

www.aashe.org

Sign up for the free bulletin

Search the resources and the free digest

Group discussions at

<http://www.aashe.org/lists/lists.php>




Resources for sustainability education

1. American College and University Presidents' Climate Commitment (ACUPCC) – www.presidentsclimatecommitment.org including “Education for Climate Neutrality and Sustainability” (and Green): www.presidentsclimatecommitment.org/html/solutions_academics.php - excellent document!! and new financing document
2. International - World Federation of Colleges and Polytechnics – Sustainability and Green Resources page - <http://wfcpc.accc.ca/>
3. K-12 Sustainability Standards and Resources – U.S. Partnership for Education for Sustainable Development http://www.uspartnership.org/main/show_passage/48



Certifications – A Taste



ENTRY LEVEL (including for workers without degrees or prior certification in building trades) – thanks to Green for All

- 1. U.S. Department of Labor-funded workforce training programs –**
Many DOL-funded workforce development programs now include a green building component.
- 2. Occupational Safety and Health Administration** issues OSHA 40 Hazardous Waste Operations certificates and OSHA 10 Site Safety certificates. Each allows an individual to be a hazardous waste handler and an asbestos abatement mechanic.
- 3. EPA HVAC Certification** – Allows someone to be an energy efficiency services technician in heating, ventilation, and air conditioning industry



ENTRY LEVEL (including for workers without degrees or prior certification in building trades)

- 4. Home Builders Institute** –HBI offers a **Residential Construction Academy Series**, a training program based on national standards set by the residential construction industry for essential workplace skills in the areas of carpentry, electrical, HVAC, plumbing, facilities maintenance, and masonry, and includes green, sustainable construction techniques. Used in pre-apprenticeship programs such as YouthBuild, Job Corps, vocational programs offered by high schools, workforce development programs, community colleges, correctional facilities, and trade unions. HBI recognizes certain training programs as “credentialed” if they meet certain criteria associated with the RCA Series. Credentialing allows students access to the online National Registry and HBI can match the provider with local Home Builder Associations for industry connections.

Home Builders Institute: www.hbi.org

Residential Construction Academy:
www.residentialacademy.delmar.cengage.com.



Certifications for SKILLED LABOR

(for those who already have some experience)

- **1. Air Conditioning Contractors of America (ACCA) offers EPA Refrigerant Certification.** Clean Air Act section 608 requires that individuals working on air conditioning and ventilation systems receive EPA Refrigerant Certification. ACCA offers a certification training program and tests.
- **2. North American Board of Certified Energy Practitioners® (NABCEP) –systems.** NABCEP Entry Level Certificate Program www.nabcep.org/certificates/entry-level-certificate-program
- **3. National Electrical Contractors Association (NECA)**
- **4. National Association of Home Builders offers Home Builders Institute (HBI) curriculum for Workforce Training & Employment,** which is an apprenticeship program in residential construction offered to targeted populations.
- **5. Other trade and apprenticeship programs:** Some local unions have created green apprenticeship programs.



Certifications for HOUSING PROFESSIONALS

- 1. Green Advantage® Certification for commercial and residential practitioners** – Green Advantage® is an environmental certification for building-related practitioners, primarily contractors, subcontractors, and trades people. The exam covers green building industry issues such as green building materials, siting and design.

Green Advantage®: www.greenadvantage.org

- 2. National Association of Home Builders (NAHB): Certified Green Professional™ (CGP)** – The National Association of Home Builders CGP designation recognizes builders, remodelers, and other industry professionals who incorporate green building principles into homes without driving up the cost of construction. NAHB recently released the “National Green Building Standard” for all residential construction work, approved by the American National Standards Institute (ANSI); it is intended to be an alternative, not a replacement, for LEED for Homes (LEED-H).

NAHB Certified Green Professional:

www.nahb.org/category.aspx?sectionID=1174



Certifications for HOUSING PROFESSIONALS

3. The North American Board for Certified Energy Practitioners (NABCEP) offers:

- **Solar Photovoltaic and Solar Thermal Installer Certifications**
- **Small Wind Certification** (under consideration)

NABCEP: <http://www.nabcep.org/certification>

4. The National Association of the Remodeling Industry's (NARI) Green Certified Professional (GCP): designed to recognize and identify remodelers who apply green or sustainable principles to their remodeling projects. NARI: www.nari.org



Certifications for HOUSING PROFESSIONALS

5. Residential Energy Services Network (RESNET): Home Energy Rating System (HERS): RESNET is a membership 501(c)(3) organization and its standards are officially recognized by the U.S. mortgage industry for capitalizing a building's energy performance in a mortgage loan, certification of "White Tags" for private financial investors, and by the federal government for verification of building energy performance for such programs as federal tax incentives, the Environmental Protection Agency's Energy Star program, and the U.S. Department of Energy's Building America Program.

(Thanks YouthBuild Green Pages)

RESNET: www.natresnet.org

HERS Rating: <http://hersrater.net>



Certifications for HOUSING PROFESSIONALS

6. Building Performance Institute (BPI) –BPI certification areas are Building Analyst, Air Conditioning and Heating, Building Envelope, and Multifamily. BPI certification for contractors and auditors includes written and field practical examinations.

Building Performance Institute: www.bpi.org.

7. National Association of Realtors® (NAR) Green Designation – The Green Resource Council administers NAR's Green Designation, which is designed to address the concerns of consumers who want real estate professionals with real green expertise. Green Resource Council: www.greenresourcecouncil.org

8. EcoBroker® – EcoBroker Certified professionals help clients market properties with green features, save money, and live comfortably, through energy efficiency and environmentally-sensitive choices. Training and certification are overseen the Association of Energy and Environmental Real Estate Professionals (www.aeerep.org). EcoBroker.com: www.ecobroker.com



Certification for Housing Professionals and Professional Designers

9. Appraisal Institute: www.appraisalinstitute.org

10. American Lung Association of Washington: Master Home Environmentalist Program:
[www.alaw.org/air_quality/master home environmentalist](http://www.alaw.org/air_quality/master_home_environmentalist)

PROFESSIONAL DESIGNER (Architect/Engineer) DESIGNATION

1. Build-It-Green – The Certified Green Building Professional (CGBP)

Build-It-Green CGBP: www.builditgreen.org/cgbp

2. Green Building Certification Institute's (GBCI) Leadership in Energy and Environmental Design (LEED) Professional Accreditation –

Green Building Certification Institute: www.gbci.org

U.S. Green Building Council: <http://www.usgbc.org>



Certification for Energy Management

1. **The Association of Energy Engineers** offers a number of certifications, including a Certified Energy Manager exam. You do not have to be an engineer to take this certification.

Association of Energy Engineers – <http://www.aeecenter.org>

There are more certifications.

Check for and build in quality!

Consider these for professional development for faculty in addition to the earlier links in this presentation.



Making the Green Economy Real –

Required Actions for Effective Partnerships

Ecosystem

Ecosystem

Sustainable Communities

**Public Choices and
Behaviors-Laws**

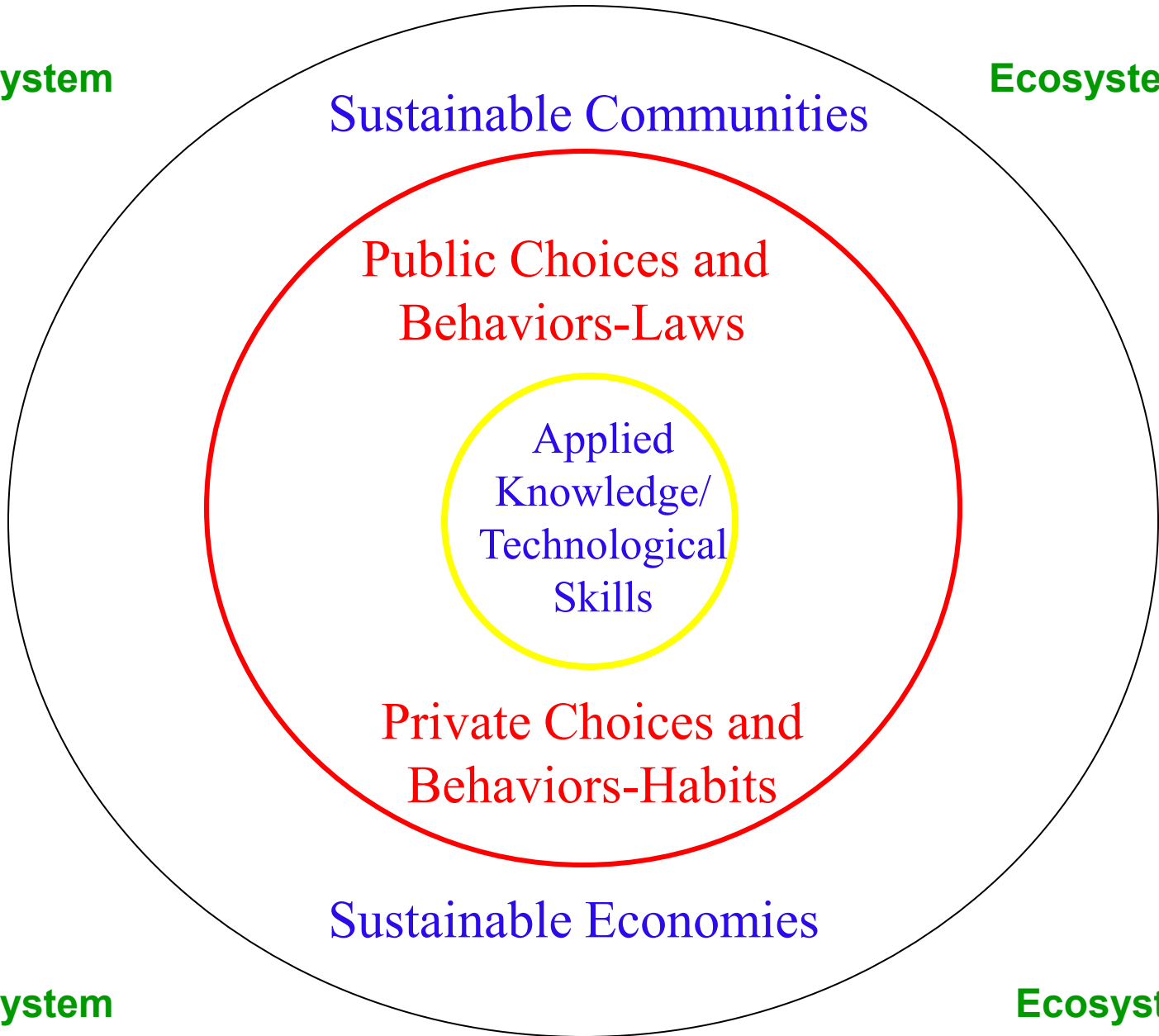
**Applied
Knowledge/
Technological
Skills**

**Private Choices and
Behaviors-Habits**

Sustainable Economies

Ecosystem

Ecosystem





Important to include:

1. Partnerships and collaboration between high schools, community colleges, four year colleges, non-profits, workforce development and continuing education (most flexible), governmental workforce agencies, economic development agencies, labor organizations, and employers
2. Ongoing professional development for educators
3. Internships that can lead to better Job Placement
4. Traditional needs assessments to identify jobs PLUS
5. Outreach to the potential employers to educate them about how to use green products and processes to help create the jobs
6. Real Career Pathways
7. Continuous Assessment/ Improvement



Policies are critical to have a real green economy

1. There is no green economy without a revision of organizational and governmental policy efforts from all of us. Fix markets that are now skewed to fossil fuels.
2. Let students know they have a civic voice and can make a difference. Share the success stories.
3. Climate change cap and trade, Utility regulation, Feed-in tariffs, Carbon tax, Renewable portfolio standards.
4. Financial regulatory policy that favor the greener economy over dirtier fuels, more health problems and a weaker economic future. We all have a role to play



Much more information than time allows.

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Green Jobs, Community Colleges, and Workforce Development :

Definitions, Strategies, Resources

1. Studies Defining and Estimating Green Jobs
2. Role of Community Colleges
3. Collaborations for Training and Workforce Development
4. National Resources and Websites

1. Studies defining and estimating Green Jobs

Greener Pathways -- Center on Wisconsin Strategy (COWS), The Workforce Alliance, and Apollo Alliance (2008)


The Green Vision: Green Jobs as Good Jobs

- *The green vision beckons: clean, vibrant cities, robust rural communities, a revitalized industrial heartland.*
- “A green job is a good job.”



1. Studies defining and estimating Green Jobs

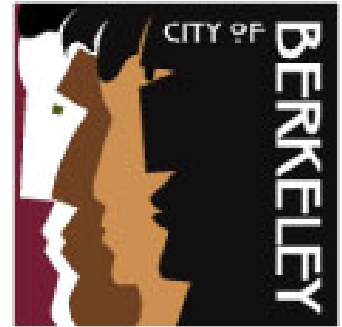
Greener Pathways -- Center on Wisconsin Strategy (COWS), The Workforce Alliance, and Apollo Alliance (2008)

- Most green-collar jobs are and will be middle-skill jobs requiring more than high school, but less than a four-year degree.
 - PhDs, financial analysts, and engineers hold green jobs and directly contribute to building a green economy.
 - “But publicly-funded workforce development projects should promote green-collar jobs accessible to those with less than a BA.”
- 

1. Studies defining and estimating Green Jobs

Green Collar Jobs: A Case Study of Berkeley, California Pinderhughes 2007

- Green collar jobs are blue collar jobs in green businesses – manual labor jobs in businesses whose products and services directly improve environmental quality.
- Green collar jobs represent an important new category of work force opportunities because
 - relatively high quality jobs,
 - relatively low barriers to entry,
 - sectors poised for dramatic growth.

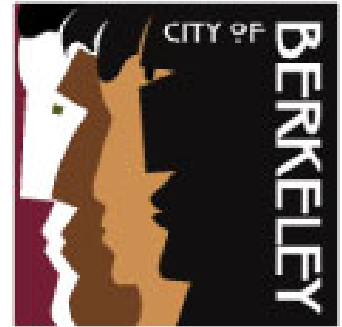


Office of Energy and
Sustainable Development
Study by Dr. Raquel
Pinderhughes, 2007

1. Studies defining and estimating Green Jobs

Green Collar Jobs: A Case Study of Berkeley, California Pinderhughes 2007

- 22 U.S. economic sectors currently provide Green Collar Jobs including:
 - Energy retrofits to increase efficiency
 - Green building and landscaping
 - Hauling and reuse of construction materials and demolition materials and debris



Office of Energy and
Sustainable Development
Study by Dr. Raquel
Pinderhughes, 2007

1. Studies defining and estimating Green Jobs



How many Green Jobs are there in the U.S.?

2008 study by the the U.S. Conference of Mayors generated a count of U.S. employees currently in green activities, based on 2006 data.

Identified green activities	Number of employees
Renewable Power Generation	127,246
Agriculture and Forestry	57,546
Construction & Systems Installation	8,741
Manufacturing	60,699
Equipment Dealers & Wholesalers	6,205
Engineering, Legal, Research & Consulting	418,715
Government Administration	71,900
Total	751,051

1. Studies defining and estimating Green Jobs

Greening of the World of Work: Implications for O*NET®–SOC and New and Emerging Occupations

Dierdorff, Norton, Drewes, & Kroustalis,
North Carolina State University and
Rivkin & Lewis, National Center for
O*NET Development, February, 2009.



www.onetcenter.org

A comprehensive analysis of current and emerging green jobs with an analytical framework adaptable to other states and workforce regions.

2. Role of community colleges



GOING GREEN 



What is the role of Community Colleges in Green Job training?

- Community Colleges provide the pathways to train employees for emerging Green Jobs through:
 1. Connection to local and regional labor markets
 2. Flexibility to respond to changing industries and skill requirements
 3. Ability to offer necessary level of education for Green Collar Jobs

2. Role of community colleges

Green Jobs as Pathways from Poverty Van Jones Concepts



- Past Revolutions have left the poor behind still in poverty:
The green revolution can bring
both environmental and social change.
- If green jobs are family-supporting, career-track jobs
open to people without high levels of education.
- Historically, community colleges have moved the working poor
to middle-skills jobs with sustaining wages.

3. Collaborations for Training and Workforce Development

Who are the key collaborators?

Business and Industry

Community-Based Organizations

Workforce Boards

Labor Unions

Utilities

Federal and State Agencies

State and Local Governments

AND

Community Colleges with Other Community Colleges



3. Collaborations for Training and Workforce Development



Another approach to Green Jobs Training:

Colleges and universities, in the same region or state, often concurrently develop the same programs separately and in isolation.

A networked, sharing approach can accelerate change.

Website: www.ilccsn.org

3. Collaborations for Training and Workforce Development



The Illinois Community College Sustainability Network has just joined all 39 community college districts together to share resources and green jobs program development.

- Seeking ARRA funding for initiatives together
- Partnering with universities, workforce boards, and community based organizations and others.

3. Collaborations for Training and Workforce Development



Sample curriculum developed through the ICCSN:

- Building Operator Certification
- Sustainable Home Design
- Renewable Energy Site Assessor
- Home Energy Rating Systems
- Basic Photovoltaics
- Energy Auditing

3. Collaborations for Training and Workforce Development

Chicago Climate Action Plan

Reducing emissions by 80% by 2050

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

Climate Action Plan produced the
Green Jobs for All Report

Another local effort is the

Chicagoland Green Collar Jobs Initiative:

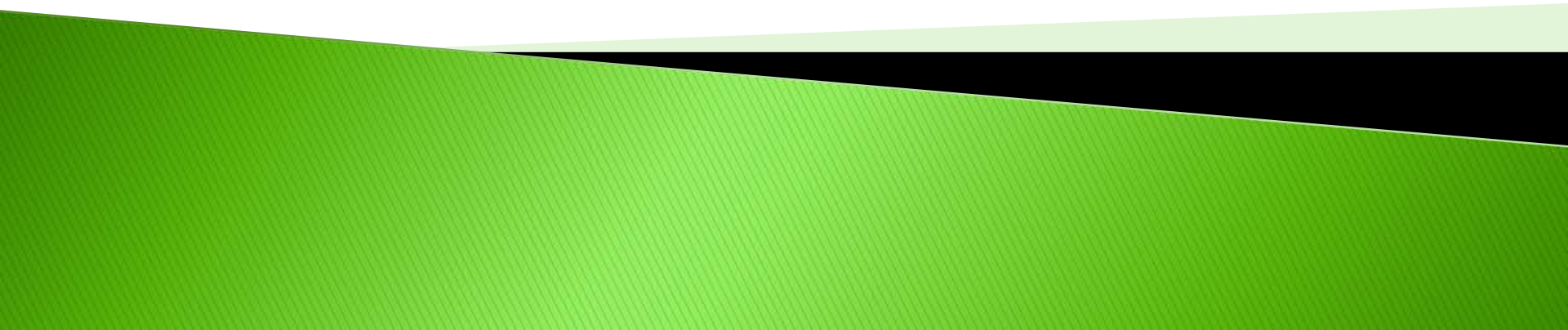
<http://www.greencollarchicago.org/>



3. Collaborations for Training and Workforce Development

Chicagoland Green Collar Jobs Initiative

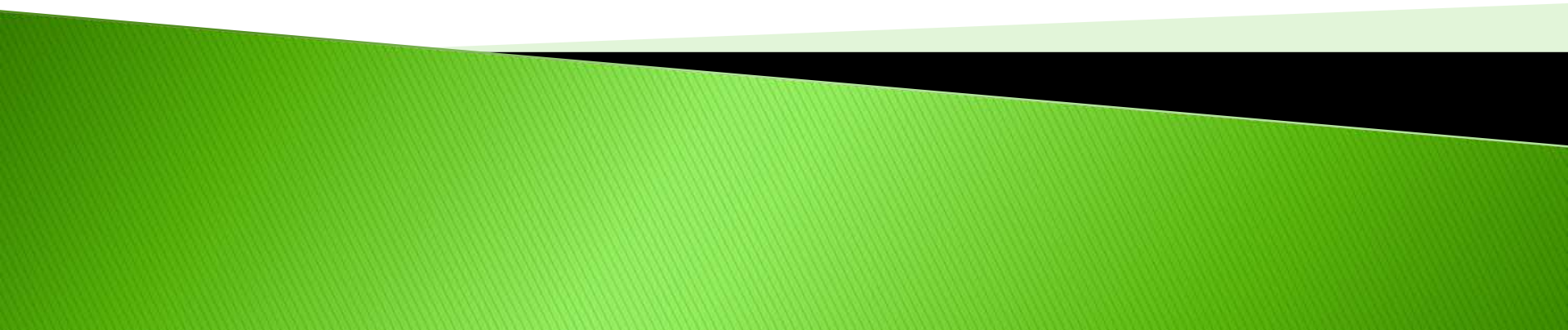
The CGCJI (the Initiative) is a multi-organizational collaborative,
working to facilitate
the development of a skilled workforce
for the emerging green economy.



3. Collaborations for Training and Workforce Development

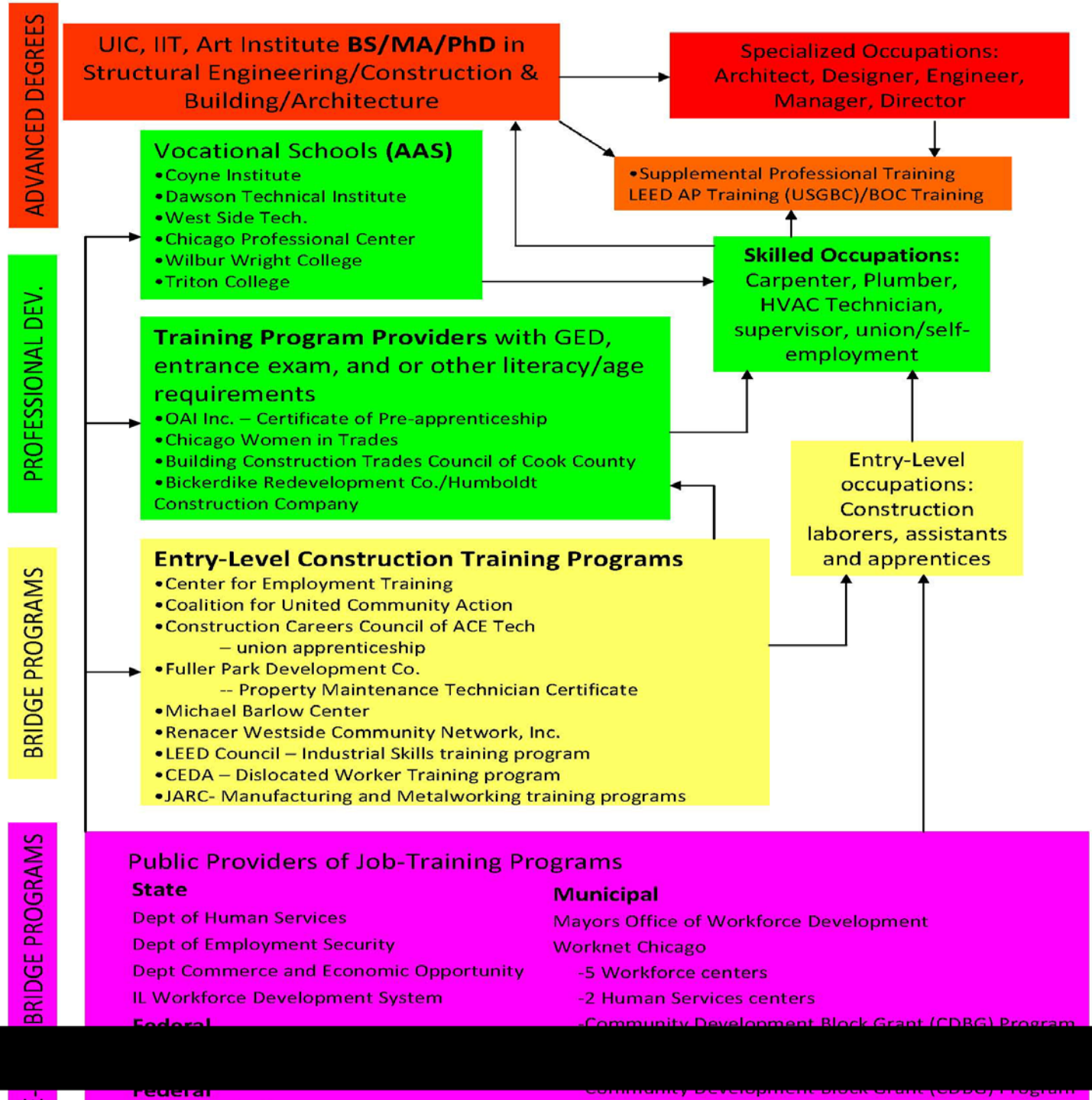
Chicagoland Green Collar Jobs Initiative

Overall goal: to promote and develop a green collar workforce system that integrates green business growth, innovative workforce development, and emerging environmental practices and policies into a vibrant regional economy.



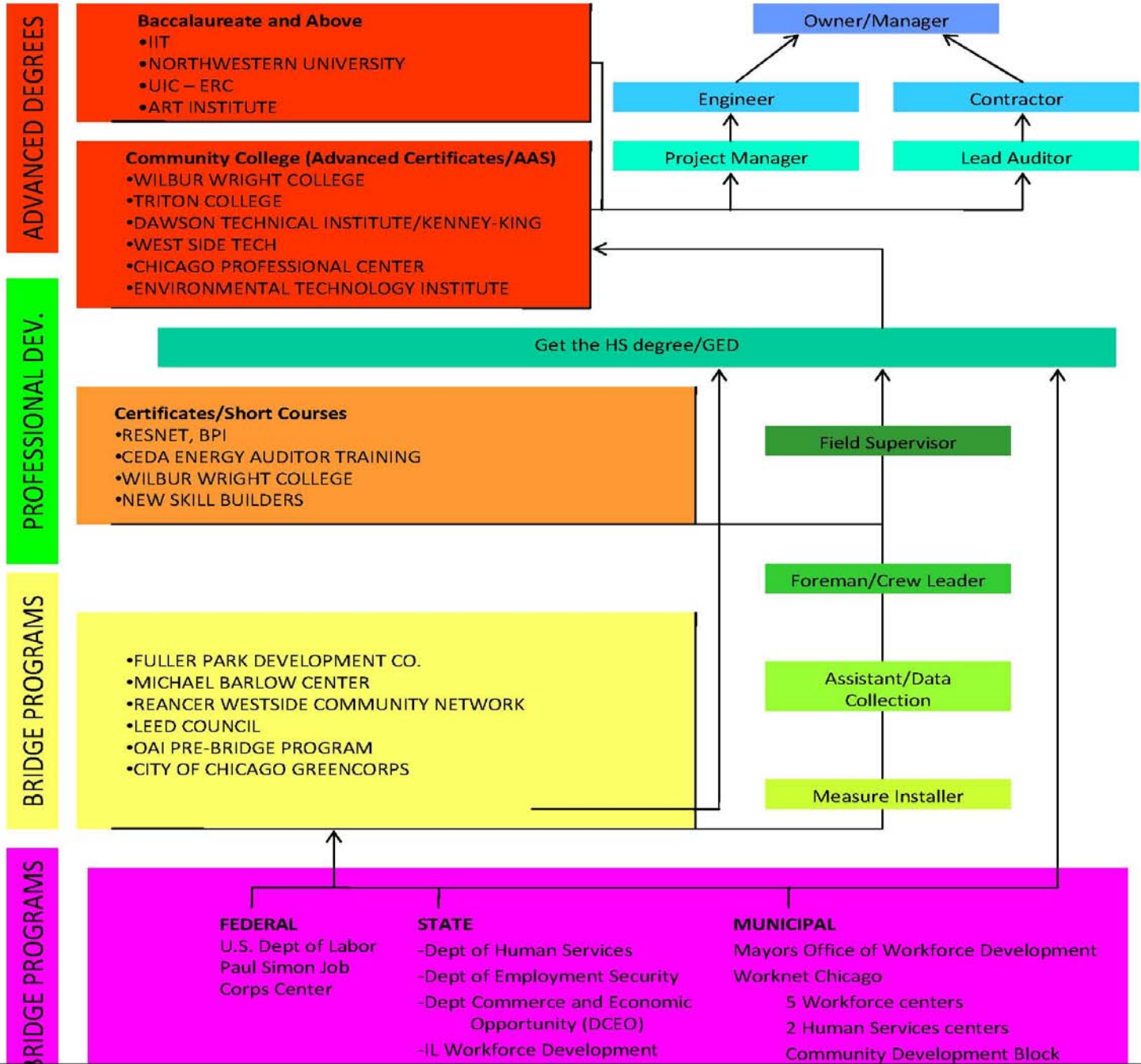
CGCJI Career Maps:

Building Construction, Operations, & Maintenance



CGCJI Career Maps:

Weatherization Laborer/ Energy Auditor



4. National Resources

► Websites for information:

- Federal Agencies: Energy, Labor, Education
- Association for the Advancement of Sustainability in Higher Education
<http://www.aashe.org/>
- American College and University Presidents Climate Commitment
<http://www.presidentsclimatecommitment.org/>

4. National Resources

- ▶ Websites for Federal Agencies:
 - Energy, Labor, Education

- ▶ Comprehensive Resources:

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



- ▶ Green for All website has policies, definitions, guides, and numerous resources.

4. National Resources

American Association of Community Colleges (AACC)

- ▶ AACC realizes the importance of the national role for community colleges in the new energy economy and has formed a task force which will ...
 - **gather resources on community college green jobs programs**
 - **promote the role of community colleges in training for green jobs.**
- ▶ www.aacc.nche.edu/sustainable

Green Jobs, Community Colleges, and Workforce Development : Definitions, Strategies, Resources

Jerry Weber
President, College of Lake County
Illinois

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Workforce Investment System Resources to Promote a Green Economy

Jennifer Troke
US Department of Labor
Employment and Training Administration



EMPLOYMENT AND TRAINING ADMINISTRATION
UNITED STATES DEPARTMENT OF LABOR

The Importance of Green Jobs



"Green jobs play an important role in our economic recovery. The promise of green jobs is not only to help re-start the economy and put Americans back to work, but also to help make America more energy independent. Investment in our nation's clean energy future will not only secure America's energy supply but will do so in ways that promote economic stability and the advancement of all our communities."

- Secretary of Labor, Hilda Solis



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State Level Role



- States Can Promote Green Job Creation by:
 - Encouraging partnerships
 - Regional, State and Local collaboration
 - Government agencies, business, education
 - Supporting education and training programs
 - Secondary (High School and CTE)
 - Post Secondary (Higher Ed and Career Training)
 - Adopt nationally recognized standards
 - Energy Efficiency, Technical Training (Wind & Solar)
 - Competency Model Clearinghouse:
careeronestop.org/competencymodel
 - Provide leadership through public campaigns and promotions



Greening of Occupations – What are the Skills Workers Need?



O*Net Report available online at onetcenter.org/reports/greent.html

- **Green Growth Occupations:**

- Increase in the employment demand for an existing occupation
- Changes in work context
- Few if any significant changes in work (tasks) and worker requirements of the occupation

- **Green Enhanced Occupations:**

- Significant changes in work and worker requirements
- Essential purposes of the occupation remain the same, but tasks, skills, knowledge, and external elements, such as credentials, have changed
- May or may not result in an increase in employment demand for the occupation

- **Green New & Emerging Occupations:**

- Unique work and worker requirements tied to a new “Green” occupation relative to the O*NET taxonomy.
- Examples: Wind Turbine Service Technician & Solar Panel Installer



American Recovery and Reinvestment Act (ARRA)



- DOL Received ~\$4.5B to Support the Public Workforce System



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What are DOL's Green Investments?



- \$500 Million to Prepare American Workers for a Green Economy
- Full Solicitations Available Online at:
www.doleta.gov/grants
- Prospective Applicant Recordings at:
<http://greenjobtraininggrants.workforce3one.org/>
- Panelist Opportunities:
www.workforce3one.org
- Five Separate Solicitations:
 - State LMI Improvement Grants (Closed!)
 - Energy Training Partnership Grants
 - Pathways Out of Poverty Grants
 - State Sector Training Grants
 - Green Capacity Building Grants (Closed!)





Who Can Apply for DOL Funding?

SGA Category	State LMI Improvement \$50M	Energy Training Partnership* \$100M	Pathways Out of Poverty \$150M	State Energy Sector and Partnership* \$190M	Green Capacity Building \$5M
Eligible Applicants	State Workforce Agencies Consortia of State Workforce Agencies	National Labor-management orgs w local networks; Statewide or non-profits w partnerships of employers, WIBs and others <div>Auto workers training funds</div>	Nat'l orgs w local networks, coalition members or others; local organizations	State workforce Boards in partnerships with their State Workforce Agency, local WIB and One-Stop Centers <div>Auto workers training funds</div>	<u>DOL programs:</u> Indian and Native American program, NFJP, Prisoner Re-entry, SCSEP, Heroes at Home/Military Spouses, WANTO, Registered Apprenticeship, YouthBuild, Young Offender



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 **Podcasts to Go**
Posted on May 19, 2009 at 11:16AM

Knowing that everyone is busy these days, Workforce³ One is now featuring excerpts of some of the most popular webinars as "just-in-time" podcasts. These short snippets provide you with the key points from the webinar presenters and if you want to learn more about the topic, you can then view the recorded webinar. Below are a few of the newly posted podcasts. To view all of podcasts, just click "podcasts" on the bar above

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ETA Resources and Information: (continued)



- Resource Websites and Customer Support
 - www.doleta.gov
 - www.workforce3one.org
 - www.careervoyages.gov
 - www.servicelocator.org
 - 1-877-US2-JOBS (TTY: 1-877-889-5627)

