

**Strategies for Building Connecticut's
Energy Career Pipeline:
*Creating Pathways for the Entry-level Worker***



**By Connecticut Business & Industry Association
Education Foundation
For Workforce Solutions Collaborative of MetroHartford
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PREFACE

In 2008, United Illuminating and Northeast Utilities, the state's two largest utility companies, formed the Connecticut Energy Workforce Development Consortium (CTEWDC). The goal of the Consortium, whose members include leaders from traditional and alternative energy companies, technical schools, higher education and workforce investment boards, is to address the state's need for an energy workforce that meets the demand of state employers. The work of the Consortium is managed by the Connecticut Business & Industry Association (CBIA) Education Foundation, the state's largest, broadest-based business membership organization.

In 2009, the Workforce Solutions Collaborative of Metro Hartford (WSCMH) awarded the Consortium a planning grant to study career pathways and entry-level employment opportunities for the region's low-skilled and unemployed individuals in the energy-related sector. At the same time this is intended to assist Connecticut's employers in filling the energy career pipeline.

The project included three major activities, which were as follows:

- Establishing an Energy Utility Workforce Partnership (the EUWP is an arm of the Consortium) to support and advise the grantees and their recommendations
- Conducting an environmental scan of Connecticut's entry-level jobs in the energy sector with a particular focus on the MetroHartford region, and
- Creating a report that provides recommendations for a comprehensive energy workforce development initiative for the Hartford labor market.

While the report offers guidance to state employers, training providers and agencies that support entry-level workers, the strength and endurance of this project lies in new collaborations that will outlive the data. The EUWP and others who have contributed to this project will continue to provide the ongoing expertise needed to build a sound energy and utility career pipeline, career ladders and brighter futures for Connecticut's unemployed and underemployed.

Acknowledgments

We would like to thank the funding collaborative and steering committee of the Workforce Solutions Collaborative of MetroHartford including the Hartford Foundation for Public Giving, the Nutmeg Foundation, the Connecticut Council for Philanthropy, Capital Workforce Partners, and the United Way of Central and Northeastern Connecticut. We would also like to acknowledge members of the Energy Utility Workforce Partnership (EUWP), CBIA consultant Cyndi Billian Stern, Billian Stern Consulting, LLC, and staff Jason Giulietti and Sonya Richmond, and the many energy sector professionals who were interviewed for this report including employers, training and service providers. They include:

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INTRODUCTION

The purpose of this report is to establish a plan for the Hartford labor market to boost energy-sector opportunities for low-skill, entry-level workers in both the traditional energy sector, as well as the newer, evolving “green” sector. The information will be used as a foundation for an energy workforce plan, including the development of a regional energy-career pipeline program. This information is key to MetroHartford’s low-skilled workers and energy sector employers if they are to participate fully in the economic recovery.

Several questions need to be answered to ensure the sector’s growth in the MetroHartford live and work region:

- How can we better define the evolving energy sector and its entry-level occupations?
- What are the current and near future projections for entry-level jobs in the sector?
- How can we better prepare and engage young workers for energy careers?
- Are training providers and educators offering programs that meet the needs of employers, youth, entry-level and unemployed skilled workers?
- Are career pathways clearly defined and marketed?
- What are the barriers that cause entry-level workers to fail, or not move up the ladder?
- What leadership and policies are necessary to boost entry-level opportunities for this sector?

The following report addresses these questions and provides recommendations based on the findings of an environmental scan, conducted from July through October of 2010. The scan includes surveys of employers and training providers in the energy and energy-related sector, focus groups and individual interviews of workforce development and energy industry experts, and references to research and model programs.

A. Research Limitations

The first limitation of the project was the lack of agreement on a definition of the “energy sector”. The sector is in transition due to rapid advances in technology, “green” policies addressing the negative impacts of climate change, and efforts to decrease dependence on foreign oil.

Secondly, the energy industry has been and continues to be strongly influenced by the volatile economic and political climate, making long-term workforce development planning and implementation difficult to project.

Lastly, while overall sample sizes of the two surveys¹ were adequate for this environmental scan, some questions only applied to a segment of those surveyed, leading to a low response rate on some questions, and thus reducing the validity and reliability of the data. It is important to note that only private sector employers were included in this sample, thus views from municipalities and other public sector organizations that have benefitted from stimulus funds are not reflected in the results. To

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¹ CBIA conducted two surveys for the project, an employer survey and a training provider survey.

address these limitations, we interviewed over 30 employers and energy experts representing various subsectors, and looked to existing research to substantiate our findings.

B. Definitions

It is important to clarify the definition of the energy and energy-related sector, especially traditional energy vs. greener industries, when performing an environmental scan. The United States Department of Energy and PEW Charitable Trust define **green industries in the energy sector** as those involved in renewable energy and energy efficiency. Renewable energy includes: solar (PV and solar thermal), wind, geothermal, fuel cell, biomass and biofuels, hydrogen fuel cells, and ocean technologies (tidal and wave energy). Energy efficiency includes: commercial and residential buildings, consumer products, and other technologies that reduce energy consumption, such as smart grids.²

The general consensus for defining **jobs in the energy sector** according to the Center for Workforce Information and Analysis is as follows:

- *Emerging*- Including energy auditors of buildings and other systems, wind technicians working with wind turbines, geothermal installers, solar panel installers;
- *Evolving*- Including employees mastering new skills, allowing them to become experts in green jobs, such as conservation retrofitters; and
- *Traditional*- Including construction laborers working on green building jobs, machinists making parts for wind turbines, refuse and recyclable materials collectors.³

For purposes of this environmental scan, **energy and energy-related companies** were defined as *electric, traditional and renewable, gas, alternative energy companies (e.g., fuel cell), as well as those engaged in energy efficiency activities.*

For the definition of entry-level workers we gathered input from employers. They indicated that **entry-level workers** are those with no more than a high school or vocational technical degree, GED or certifications.

C. Methodology

Employer Survey

This survey was e-mailed in July and August 2010 to approximately 560 Connecticut businesses in the energy sector. There were 110 surveys completed, for a 19% response rate. All figures are rounded to the nearest whole number and may not total 100%. Additionally, the percentages quoted in this report relate to the number of respondents answering each question; thus, the sample size for each question varies.

² Surveying Green Definitions: “What is a Green Economy? What are “Green jobs? Center on Education and the Workforce, Georgetown University

³ “The Pennsylvania Green Jobs Report”, prepared by the Center for Workforce Information and Analysis for the Pennsylvania Department of Labor & Industry, January, 2010.

Training Provider Survey

This survey was e-mailed in August 2010 to Connecticut organizations who currently provide training in the energy sector. There were 29 surveys completed, for a 38% response rate. The sample obtained provides an adequate representation of the available population to make reasonable judgments of those surveyed. The percentages quoted in this report relate to the number of respondents answering each question; thus, sample size varies for each question. All figures are rounded to the nearest whole number and may not total 100%.

Interviews and Focus Groups

Employers and training providers who were interviewed for this project are listed in the acknowledgment section of this report. The first employer focus group was held in July 2010 at CBIA. A second was held in September 2010 at Northeast Utilities in New Britain, and consisted of seven employers from energy auditing and energy efficiency companies. A third focus group was held in October 2010 at Community Renewal Team and was attended by the staff that coordinates and manages a comprehensive energy workforce development program for low-income, low-skilled applicants in greater Hartford. Members of the Energy Utility Workforce Partnership (EUWP), a subcommittee of the Connecticut Energy Workforce Development Consortium (CTEWDC) that was formed to guide this project, provided valuable feedback on survey findings, implications and recommendations.

D. CONNECTICUT'S ENERGY SECTOR WORKFORCE LANDSCAPE

There are several factors that make investing in energy workforce development programs a smart move in Connecticut. From a policy perspective, Connecticut ranks eighth in the country⁴ in state energy efficiency programs and Governor J. Jodi Rell has considered clean air initiatives a priority. Her vision calls for 20% of all energy used or sold in the state to come from clean or renewable resources by 2020. This "green" commitment should have a positive impact on job opportunities, however, according to a 2009 study by Navigant for the Connecticut Clean Energy Fund (CCEF)⁵ the opportunities, especially in fuel cells and solar are highly dependent on government subsidies. Despite this, Navigant concluded, "...there is significant growth potential in the energy efficiency and renewable energy economy..." which account for over 4,500 jobs (.27%) in the state's labor force. This report highlighted two job areas associated with high job creation appropriate for low-skilled entry-level workers: fuel cell manufacturing and residential energy efficiency positions.

Federal stimulus funds have been pumped into clean energy and other "green" training programs across the state. In some instances market demand for these "green" jobs does not yet exist, or is growing at a slower-than-predicted pace due to the recession. But the "graying" workforce may open doors to the energy career pipeline, to make up for the uncertain economic conditions. According to a 2010 report⁶ from the Center for

⁴ American Council for Energy Efficiency, retrieved on October 27, 2010 at <http://www.aceee.org/energy-efficiency-sector/state-policy/aceee-state-scorecard-ranking>.

⁵ Connecticut Renewable Energy/ Energy Efficiency Economy Baseline Study, CCEF, retrieved on October 12 from http://www.ctcleanenergy.com/Portals/0/Phase%201%20Deliverable%20revision%2017_Final%20Exec%20Summary.pdf

⁶ Gaps in the Energy Workforce Pipeline, CEWD 2009 Survey Results, Center for Workforce Development

Energy Workforce Development (CEWD), approximately 46% of the energy sectors national skilled technician workforce will leave the field by 2015 due to retirements or attrition. According to Peter E. Gunther of the Connecticut Center of Economic Analysis, the situation in Connecticut is even more severe -- about 53% of the utilities industry workforce is age 45 or older and many will approach retirement within the next 10 years.

An estimate of current and future jobs in the energy sector in Connecticut is described in Appendix B of this report. Since the Bureau of Labor Statistics (BLS) does not have an "energy sector," CBIA developed with input from the EUWP, an energy occupation chart for this project. It combines occupations listed in the BLS Utility Sector; green occupations found on the Department of Labor's (DOL) Occupational Information Network (O*NET) site; occupations identified by the Center for Energy Workforce Development (CEWD); and green careers developed by the Institute for Sustainable Energy for the Workplace's Green Up project in Bridgeport.

The energy occupations in Appendix B align traditional with green careers on the O*NET site. It is a temporary measure to help training providers and employers tap into energy occupational outlook information. The intent is to show how traditional and green careers relate to each other and how skills in one occupation might segue into new career pathways. The O*NET green careers site has the advantage of linking energy-related occupations to state training providers. However, currently there are some training programs that are not listed. Using this structure to list traditional and green energy occupations may help training providers use the site to market their services.

Key Energy Funding for Connecticut

American Recovery and Reinvestment Act Funds for Connecticut

Since 2009, Connecticut has received over \$277,500,000 in American Recovery and Reinvestment Act (ARRA) funding from federal agencies to implement a wide range of energy-related programs, including energy-related research, and training and implementation of energy saving measures, e.g. weatherization. Each type of funding has the potential to impact the energy workforce, either directly through job development, or indirectly through jobs created as result of energy saving measures. Weatherization programs and incentives to install renewable energy or energy efficient equipment, for example, has increased the demand for energy efficient goods and services and, the resulting need for employers to hire workers with the requisite skills to carry out the work.

Additionally, the Connecticut Office for Workforce Competitiveness (OWC) has been awarded a \$3.3 million dollar State Energy Sector Partnership grant from the U.S. Department of Labor to build the state's capacity to train and upgrade the skills of unemployed and incumbent workers for jobs in green industries and in the energy sector. The goal is that 895 individuals will be served throughout the course of this grant. OWC expects that 75% of participants will be incumbent workers.

It is important to note that these are one-time grants and there is no expectation that they will continue especially in light of current economic and political conditions. A chart with a listing of federal funds is found in Appendix C.

Connecticut Specific Energy Workforce Related Funding

Perhaps the most consistent, reliable source of funding is the Connecticut Energy Efficiency Fund (CEEF). The history of the CEEF dates back from legislation enacted in April 1998 in concert with Connecticut's original electric-industry restructuring legislation (Public Act 98-28. The law created separate funds to support energy efficiency and renewable energy. The efficiency fund is known as the Connecticut Energy Efficiency Fund (CEEF), and the renewable fund is known as the Connecticut Clean Energy Fund (CCEF).⁷

Connecticut Energy Efficiency Fund: The mission of the CEEF is to advance the efficient use of energy, to reduce air pollution and negative environmental impacts, and to promote economic development and energy security. The electric companies, Connecticut Light and Power Company (CL&P) and United Illuminating Company (UI), and the gas companies, Yankee Gas Services Company, Connecticut Natural Gas Corporation and The Southern Connecticut Gas Company, administer the energy-efficiency programs the Fund supports, providing energy-efficiency expertise and financial incentives to help their customers reduce the amount of energy used in their homes and businesses.⁸

Expenditure of these funds results in increased business for many residential and commercial and industrial energy-efficiency and conservation vendors. However, as noted in employer focus groups, policy and marketing of the products and services is imperative in order for them to have a viable business. Growth in these businesses represents a significant opportunity for entry-level employment.

Connecticut Clean Energy Fund: CCEF offers financial incentives and educational programs to encourage homeowners, companies, municipalities, and other institutions to support renewable energy. Funding includes the availability of incentives such as the **\$3 million available to support installation of solar photovoltaic equipment at commercial, industrial and institutional sites in Connecticut.** *Programs like these will help sustain employers/vendors in the energy sector.*

Other Funding:

Opportunities offered by the Connecticut Office of Policy and Management (OPM) are listed below.

New Energy Technologies: The purpose of the New Energy Technology (NET) program is to identify new technologies and provide assistance in getting them to market. The program saves energy, improves air quality, and helps invigorate Connecticut's economy by creating employment opportunities. Grants are awarded to applicants who submit promising Connecticut technologies. Guidance is provided to recipients to find technical and financial assistance. The NET Grants have been awarded for the past 14 years to help small firms commercialize new energy related technologies. These grants provide \$10,000 each for up to five small firms per year.

⁷ Retrieved on October 27, 2010 at [http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=CT12R&re=1&ee=1\)why](http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=CT12R&re=1&ee=1)why)

⁸ Retrieved on October 27, 2010 at <http://www.clp.com/Business/SaveEnergy/AboutCEEF.aspx>

K-12 Schools-Heating System Efficiency Grants

Limited grants are available for K-12 schools to upgrade heating systems. They may provide opportunities for entry-level energy efficiency jobs. The program will provide up to 50% match to a maximum of \$30,000 for efficiency improvements to heating plants and distribution systems. (Funds cannot be used for conversions.)

Building Operator Certification Training

Several Level 1 and Level 2 Building Operator Certification courses will be offered to municipal and state agency building management personnel between fall of 2009 and spring of 2012. For information on course content visit <http://www.theboc.info/training.html>.

In summary, Connecticut's energy sector over time could be robust with opportunities for the MetroHartford Region's low-skilled entry-level worker. It will however, need a collaborative effort that includes leadership to steward policies, funding and high quality programs over the long-term.

II. SUMMARY: KEY FINDINGS, SUPPORTING RESEARCH, AND RECOMMENDATIONS

Key Findings	Supporting Research	Recommendations
<p>I. The energy sector and its occupations are not clearly defined due to advances in its “green” subsector</p>	<ul style="list-style-type: none"> • Bureau of Labor Statistics will not categorize the green sector (which includes energy occupations) until 2012 • Employers, training providers, job seekers and other stakeholders use different terms and systems • 1/3 of employers surveyed were unable to identify their subsector from 16 North American Industry Classification System Codes (NAICS) 	<ol style="list-style-type: none"> 1. Work with state organizations, e.g., CT Department of Labor (DOL) and Office of Workforce Competitiveness (OWC) to define, categorize and improve existing web sites (e.g., Skillproof) that identify training needs and job openings ⁹✓ 2. Conduct further research in collaboration with regional groups, i.e., the New England Clean Energy Consortium and the Energy Utility Workforce Partnership (EUWP) to define training needs, subsectors and aggregate demand regionally✓ 3. Work regionally to identify and create training programs that meet demand of growing sectors and the needs of employers, trainees and workers
<p>II. Connecticut's energy workforce needs vary widely by subsector and company size</p>	<ul style="list-style-type: none"> • Some subsectors are expanding (energy efficiency) while others are contracting (nuclear energy) • Entry-level workers comprise about 20% of the energy workforce surveyed. The largest percentage are found in companies with less than 50 employees • Although 65% of companies say they are hiring in the next 12 months most are hiring only one or two workers 	<ol style="list-style-type: none"> 1. See 1.1 2. See 1.2 3. Identify and survey employers by sector, at regularly established intervals to determine the impact of stimulus funds and new policies 4. Use the information to provide time-sensitive feedback to employers and training providers to help them establish effective workforce programs
<p>III. Employers and training providers are not effectively collaborating on a plan to solve regional workforce needs</p>	<ul style="list-style-type: none"> • One in five employers reported difficulty finding <i>qualified</i> entry-level workers • 9 out of 10 employers cited failure to pass basic education requirements as their biggest barrier • 42% of training providers surveyed do not track trainee completion and placement • 55% of employers said they “poached” qualified entry-level workers from other companies rather than sought them via training institutions • Employer interviewees revealed that certificates do not guarantee competency because trainers lack critical field experience 	<ol style="list-style-type: none"> 1. Convene employers (including ones who report poaching as their top method of recruitment) and training providers to design programs to answer employer needs and boost trainee placement (see II.4) 2. Require tracking of completion and placement ✓ 3. Develop coursework consistent with nationally valued certifications and credentials✓ 4. Support existing state and national pipeline programs (Get Into Energy) to increase youth awareness and educational preparation; Offer stackable skills: Employability skills, basic skills (e.g. spoken English) and STEM skills ✓ 5. Institute teacher training and train-the-trainer programs that require/include field experiences.✓

⁹ ✓ Indicates policy work is required to achieve the recommendation.

<p>IV. Training are neither employer nor market-driven. The economic downturn and the unusual influx of stimulus funding determine what courses are taught and who takes the training.</p>	<ul style="list-style-type: none"> • Most popular course offerings in "green" training (e.g., solar thermal) are mismatched with employer's desire for traditional entry-level worker skills • Training providers indicated stimulus funds are currently driving training decisions 	<ol style="list-style-type: none"> 1. Work with the CTEWDC/ EUWP to ensure that funding policies transcend election cycles by working with state and federal policymakers ✓ 2. See III.1
<p>V. Employers are relying on temporary workers to fill job openings.</p>	<ul style="list-style-type: none"> • More than half (55%) of respondents reported hiring entry-level temporary workers with hourly wages 50% more than permanent hires • Temporary workers complicate accurate workforce enumeration(categorized as "temporary" not by functional occupation) 	<ol style="list-style-type: none"> 1. Work with DOL to establish system for employers to communicate roles that temporary workers are assuming to help identify workforce gaps ✓ 2. Include temporary agencies as employers on EUWP to better plan and develop energy career pathways 3. Recognize temporary agencies as employers of record and as important venues where entry-level workers can enter the energy career pathway
<p>VI. Transportation and childcare are top barriers for job seekers.</p>	<ul style="list-style-type: none"> • Training providers cited transportation as the top barrier for training and childcare was cited as a distant second • Employers also cited transportation as the top barrier staying on the job 	<ol style="list-style-type: none"> 1. Work with 211, employers, policymakers, and Department of Transportation (DOT) to develop policies, new services and marketing for these services ✓
<p>VII. Recruitment and training of older workers, younger workers and women should be tailored to their strengths to meet the needs of the energy workforce.</p>	<ul style="list-style-type: none"> • Employers report that almost 9 in 10 entry-level workers are under 30; Younger workers are adept in technology, but lack customer service skills and integrity • Older workers are more physically limited, may shy away from new technology, but are more dependable • Women comprised only 15% (approximately) of energy workers. • Women in technical service positions provide strong customer service skills 	<ol style="list-style-type: none"> 1. See III.5 ✓ 2. Actively recruit women for technical energy careers beginning in middle school, as a pathway out of poverty. Offer mentoring to sharpen communication skills and to support career advancement. Reach out to MetroHartford area career academies in environment, technology and health¹⁰ 3. Offer training tailored to older workers to help them gain a comfort level more quickly with new technologies
<p>VIII. Leadership and support are needed for energy sector workforce policies on the federal, state and local level to address the fluctuations in the political and economic landscape.</p>	<ul style="list-style-type: none"> • Employers report they have difficulty planning for future workforce expansion due to energy funding policies tied to political terms not long-range planning • Providers tailor programs to meet the needs of government funding, not employers • Remedial education in state and community colleges is rampant, wasting student time and money, and results in positions going unfilled 	<ol style="list-style-type: none"> 1. See IV.1 ✓ 2. See III.1 ✓ 3. See III.5 ✓

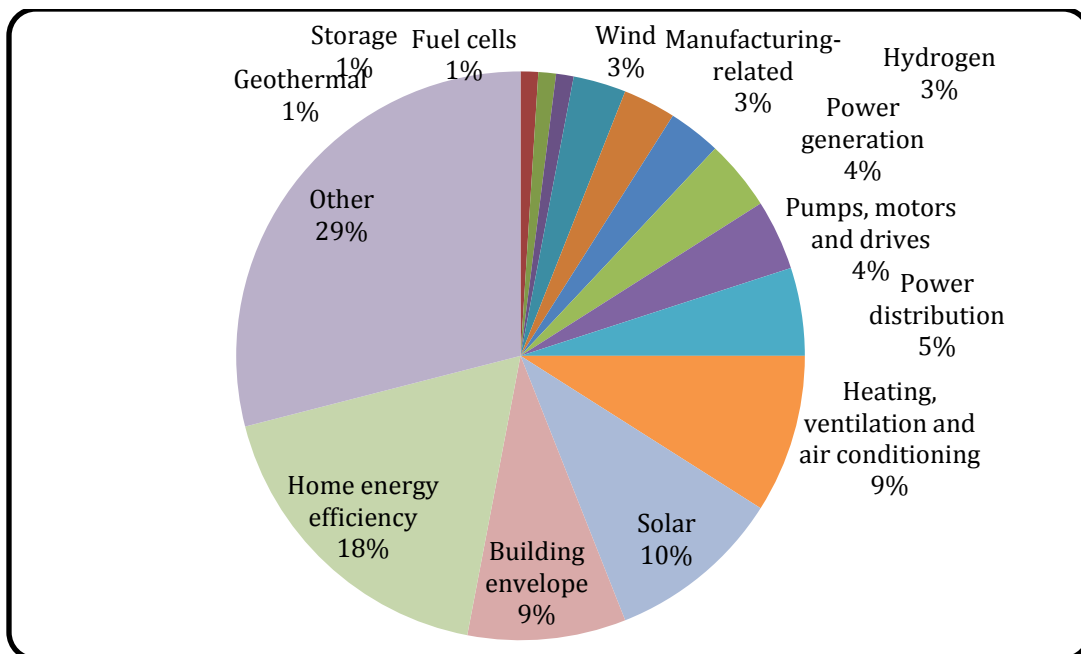
¹⁰ Health career academies can infuse information on green energy careers and concepts into the curriculum, connecting them to better health outcomes while exposing students interested in math science and technology to a new career pathway.

III. Results of Environmental Scan

Finding I: The energy sector and the occupations within it are not clearly defined due to advances in its “green” subsector.

There is currently no central clearinghouse for energy sector information because it has not yet been defined. While the Bureau of Labor Statistics (BLS) provides information and guidance about current and future employment and training opportunities in other sectors, it offers no energy sector category. There are references to the emerging green and traditional utility subsectors; however, the green sector classification will not be completed until 2012. This lack of a uniform classification system makes it difficult for job seekers, training providers, and employers to communicate job needs and opportunities.

The Employer Survey revealed that Connecticut employers had particular difficulty classifying their company within the sector classifications offered. For example, When asked, “In which sector does your firm belong?” almost one-third (29%) selected “Other,” despite being offered 16 choices based on the North American Industry Classification System (NAICS) codes. **The chart below illustrates the broad range of energy sector industries as indicated by employer responses on the survey.**



Another challenge employers face when defining their workforce needs is that a growing portion of the energy sector is “green” with a blurred line between green and traditional occupations and activities. Tom Burns, Director of Technical Training for Northeast Utilities, explained the situation like this: “A green tint is hard to describe. I would say all our jobs have a green tint. We may dabble in the technical aspects of distributed generation and advanced metering and breakers, but I would not describe that as [green] energy efficiency or renewable energy training.”

There are two projects underway that will help define Connecticut's green sector and job opportunities, a portion of which will include the energy sector. According to Patrick Flaherty, economist, Office of Research, Connecticut Department of Labor (DOL),

the Northeast Green Research Consortium is collecting labor market information for the New England states and will analyze and disseminate the data on energy efficiency and renewable energy occupations in 2011. The State Energy Sector Partnership Grant and the Green Jobs Partnership, housed in Office of Workforce Competitiveness (OWC) under the direction of Beth Auerbach, will also focus on identifying the state's green/energy sector job opportunities.

Since the results of these projects are not yet available, CBIA has developed a listing of traditional and green energy careers aligned to the careeronestop.org/green careers organizational chart. The purpose of this chart is to offer employers, job seekers and educators a tool to visualize how skills in the traditional energy sector relate to "green" energy occupations. For example, it shows how, with solar thermal training, HVAC technicians can become solar thermal (ST) technicians, enhancing their marketability in a greener economy. (See Appendix B)

Finding II: Connecticut's energy workforce needs vary widely by subsector and company size.

The following quotes illustrate the variation in workforce need by subsector.

"I spend little time recruiting because of the lull in the [construction] industry. The problem in our field is that roads are getting paved, but there are no major improvements. Funds are being raided and the industry is being crushed," said Todd Renz, a general contractor with 25 employees and a member of the Connecticut Green Building Council.

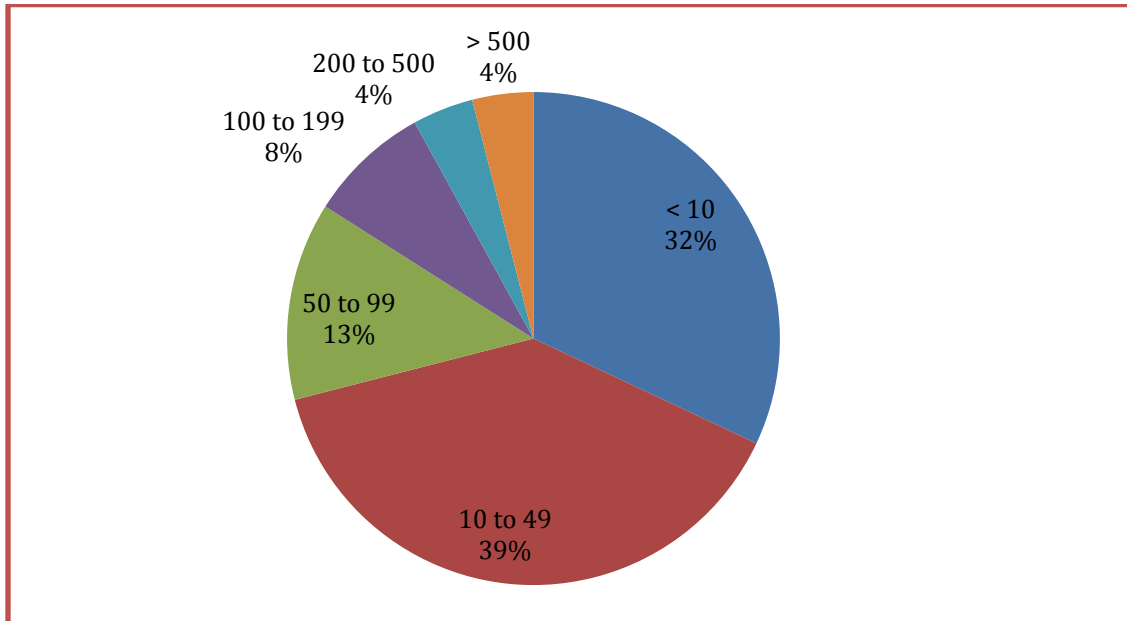
According to Peter Callan, partner in Lantern Energy, an efficiency and alternative energy company, "We have a staff of 40, and have hired 10 people in the past year. The stimulus has been great for business and I make sure that when my employees go into people's homes they present themselves professionally. That's one reason that we are growing."

Through focus groups and interviews, employers revealed the uneven growth of Connecticut's energy sector. For example, companies engaged in energy efficiency services supported by government funding, were more likely to report hiring than those performing energy work tied to the traditional construction industry. *Kevin Doyle, co-chair of the New England Clean Energy Consortium described the challenges of analyzing workforce needs in this sector:* "The only meaningful way to talk about the industry is to talk about its component sectors. You really need to conduct individual interviews to find the answers."

Interviews and focus groups revealed that in the long-term, hiring may not be in the cards for these small businesses, because future stimulus funding is questionable due to the political landscape and the economy. In terms of expansion, Raquel Kennedy of Victory Energy Solutions summed up the situation saying, "We can't plan. We make investments in our businesses, but then we don't know if we are going to have the work. We need sustainability and consistency. We need to advocate for these programs."

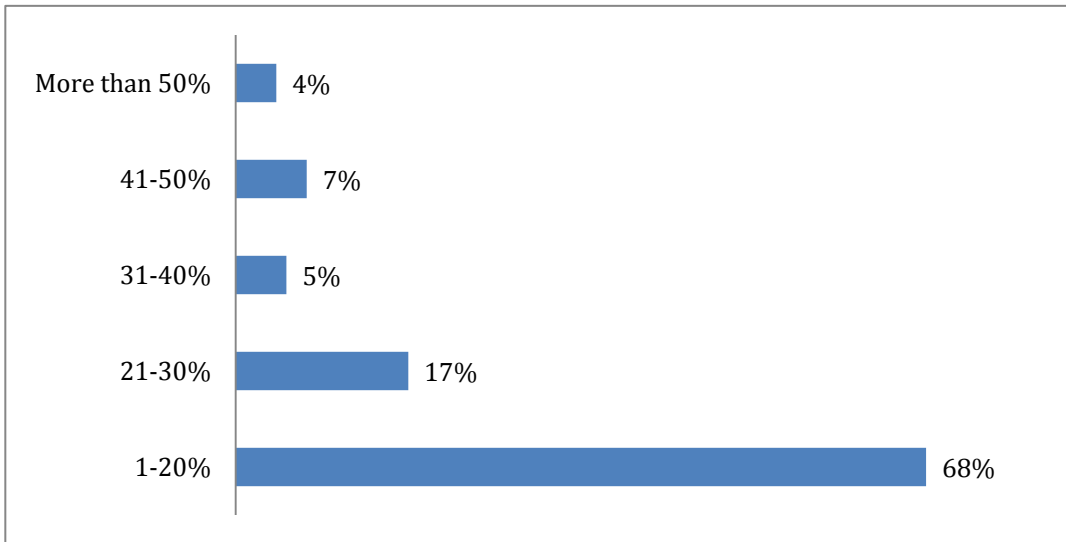
Size of Company and Entry-level Workforce Composition

Trends in expansion for entry-level positions were influenced by the size of the company and the percentage of entry-level workers it employs. While all of the largest companies (more than 200 employees) participating in the Employer Survey planned to hire entry-level workers during the next 12 months, only 57% of small companies (less than 50 employees) planned to hire. However, it was the small and medium companies that were more likely to report a planned greater rate of expansion of their entry-level workforce over the next five years.



Employer Survey: **How many people does your company employ?**

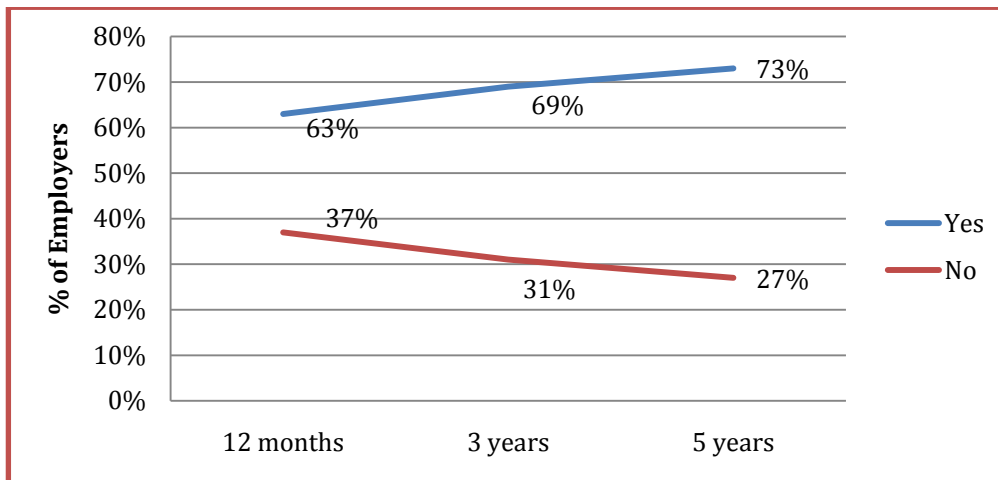
According to this study, two-thirds of those surveyed said that 20% of their employees are entry-level. This varied by the subsector and company size. For example, Northeast Utilities, the state's largest energy company, reported that only 4% of their workers were entry-level, requiring a high school degree or GED, while many of the energy auditing companies reported that more than half of their workers were entry-level. *It is important to note that while 4% may sound small, in a large company like NU, 4% translates to over 200 workers. (See chart on the next page.)*



Employer Survey: **Percentage of employers reporting on the composition of their entry-level workforce**

Plans for Hiring

Overall 65% of companies reported plans to hire entry-level workers within the next 12 months, but hiring was typically limited to one or two workers. During the next 3 to five years, three-quarters of companies surveyed reported plans to hire entry-level workers. However, *during personal interviews, employers expressed caution in hiring due to the volatile economy, unresolved policies affecting healthcare coverage, and incentives for traditional versus clean energy. The trend was to use temporary workers until they were sure that their business would support the position long-term.*



Employer Survey: **Do you plan on hiring entry-level workers over the next five years?**

Employers were asked to identify their top hiring needs. Because there were so many choices, responses were small. Information below was confirmed through employer interviews and focus groups.

Top Entry-Level Hiring Needs and Certifications Sought By Employers

- General Construction, Carpentry
- Installation, Maintenance and Repair Workers
- Production and Line Workers
- Weatherization-related workers

Certifications desired:

- BPI: Building Performance Institute (certification in energy consumption areas)
- OSHA safety training
- HVAC
- Weatherization

Finding III: Employers and training providers are not effectively collaborating on a plan to solve regional energy workforce needs.

One in 5 employers reported difficulty finding qualified entry-level workers, even in this period of high unemployment. Of these, 9 out of 10 cited failures to pass basic education requirements as the top reason why individuals were not ready for the energy workforce. Both the Employer Survey and interviews revealed a need for strong basic skills including math, spoken English, and reading.

Dona Cassella, Director of Human Resources for Northeast Utilities explained, “Some applicants just lack requisite skills, they can’t read, can’t get through a test, and can’t wire a doorbell because they can’t read the directions. But they can do it if you show them... NU started a course for 30 high school students and technical school students at Naugatuck Valley Community College. Of the 63 students that applied for the course, 50% had to take remedial courses. But we had excellent results: 12 out of 14 completed the course.”

Another sign that employers are not working effectively with training providers is their high rate of “poaching” reported by employers: When companies have trusted working relationships with training providers, they turn to providers when they need new hires. The survey revealed that employers were far more likely to turn to other companies to find new hires than they were to turn to training institutions (55% of employers reported poaching, while only 32% reported relying on training institutions). The survey also indicated that 90% of employers were comfortable substituting job experience in lieu of educational training when selecting new hires. Steve Weirzbiecki, Co-owner of Nutmeg Mechanical said, “The best training is on-the-job because that’s where you get the most up-to-date techniques. I use an employee referral program—they [employees] refer friends from other companies that have been trained OJT.... the most state of the art training that there is.”

Employers expressed mistrust of Connecticut training institutions when it came to certification and credentialing programs. While over one-third of employers surveyed identified certification and licensing needs (e.g., HVAC, energy auditing, weatherization I and weatherization II), many reported inconsistencies in the quality of candidates that have earned certificates. They complained that trainers were “hit or miss” with only some having field experience necessary to train and certify new workers in the field. As a result, many reported sending employees out-of-state for training to BPI (Building Performance Institute), a well-known and respected training organization, and/or hiring out-of-state trainers to conduct training at their place of business.

A bright spot in this research was finding those employers and training providers who had trusting, long-standing relationships. Craig Clark, Director of Northeast Utilities Conservation and Load Management Program said, “Many of our energy auditing subcontractors use the Institute of Environmental Management and Technology (IEMT) to train their workers. They have been around for a long time and know what they are doing.”

There are excellent national and local pipeline and career pathways initiatives, which could be expanded upon to improve the workforce preparation of younger workers. Two of these initiatives are described below.

CEWD has developed the Get into Energy (GIE) Career Pathways Model¹¹. It includes:

- Outreach and career coaching
- Career pathways and stackable credentials, and most important for the WSMHC,
- Employer collaboration and support.

Until just recently CEWD focused only focused on traditional utility careers such as line workers and technicians. But CEWD through its collaborations with employers, government, and educational institutions, recognized the need for including greener occupations and skill sets within the sector. In late October, GIE was expanded to include green energy career pathways and was introduced at the CEWD 2010 Annual meeting. This makes the GIE workforce development system a perfect model to be considered for inclusion in the MetroHartford region energy pipeline plan for younger workers. The GIE Energy Competency Model and Stackable Credentials are included in Appendices D and E of this report. They clearly show the order for teaching skills and how to move up the career ladder, from basic training and education through earning certificates and credentials.

Opportunities to employ the GIE model at the high school level exist at Hartford Public School’s Academy of Engineering and Green Technology. The CBIA Education Foundation is already involved in this initiative, making future integration of some GIE tools relatively easy to apply.

The Sustainable Operations and Renewable Energy Initiative (SOAR) program is operated by the Connecticut Community College System. This program, funded by a U.S. DOL grant, offers credit certificates to prepare students for jobs in the energy and green technology fields. In the greater Hartford area, Manchester Community College awards a certificate in sustainable energy. Other community college certificates include Alternative Energy Transportation Technology, Sustainable Facilities Management, Solar Technology, and

¹¹ Get into Energy website retrieved on October 2, 2010 at <http://www.getintoenergy.com/about.asp>

Alternative Energy Systems Technology, Building Efficiency and Sustainable Technology.¹²

Another effective model in the MetroHartford region can be found at the Community Renewal Team (CRT). This program brings in external trainers for a variety of weatherization training, e.g. energy auditing, weatherization I, weatherization II. CRT provides wrap-around services including childcare and transportation, expanding the range of potential workers that can access the training they need for energy workforce participation. (See page 19 for a further discussion of this program).

Finally, career advancement through training and education are available through IEMT, where career counseling and placement are available for some trainees/ training programs.

Finding IV: Training decisions are neither employer nor market-driven. The economic downturn and unusual influx of stimulus funding have determined what courses are taught and who takes the training.

The Training Provider Survey and the Employer Survey taken together indicate a mismatch between what skills employers sought in trainees, and what training institutions are offering. Employers said they want general skills, while training providers reported offering most of their courses in alternative energy areas.

There are two ways to look at this disconnect. First, employers may report wanting employees with traditional skills because they want to provide their own company specific green training to their workers --, training that requires the individuals have a foundation in energy. As Kim Stevenson, Manager of New Technologies at the Connecticut Clean Energy Fund observed, "Occupations in the energy sector, for the most part, are not brand new. You need to have a basic knowledge of carpentry or electrical wiring, as a foundation. There are just additions, modifications and new knowledge and skills that are added to the existing skill sets. *They are insulating or wiring solar thermal systems instead of traditional electrical systems ... They really need to get the basic training to avoid the disasters.*"

A second way to look at the disconnect between what training providers offer and employers want, is to examine funding incentives for training. The chart on the next page highlights this disconnect -- **only 1/3 of companies hiring are in the energy efficiency or renewable energy field, but about 60% of institutions are preparing trainees in green technologies.** Since the recession, stimulus funds have been driving training decisions, not employer and customer need. Training providers are paid to provide green skills, not traditional energy skills. A caveat of this finding is that a small number of employers and training providers answered these survey questions, however individual interviews consistently supported this disconnect between employer needs and training selections.

¹² SOAR program resources can be found at <http://www.commnet.edu/soar/soarcontacts.asp>

Energy Training Programs Offered by Most Training Providers	Types of Companies Most Likely to Hire Trainees
64% Solar Photovoltaic 57% Green Construction Technology 57% Weatherization Envelop Technology 50% Electrical Technology 36% Lean Manufacturing (Energy Related) 29% Wastewater treatment 29% Residential Auditing 29% Geothermal Technical	72% Traditional 33% Environmental Technology 33% Renewable and Energy Efficiency 28% Wastewater Management and Conservation 17% Green Building

From the Training Provider Survey

Kevin Doyle, co-chair of the New England Clean Energy Consortium explained how the stimulus funds were directed to meet specified employment and environmental goals—not employer needs. According to Mr. Doyle, “The residential energy efficiency (EE) stimulus funds went to low-income weatherization assistance programs (WAP) with those agencies providing weatherization services benefiting greatly. The funding went to specific sectors -- \$5 billion to the Weatherization Assistance Program (WAP) and Heating Assistance Program and was funneled through state energy offices to CAP (Community Action Program) agencies, which provided weatherization training opportunities for low-skilled, low-income workers.”

According to Yolanda Rivera of the Hartford Jobs Funnel, a job training and placement service for construction job seekers in the region, the employer-training disconnect was more of a problem last year, when the economy left few contractors with enough work for even their existing workers. Few companies were in the position to hire her trained weatherization workers.

The Training Provider Survey provided further insight as to why they are not meeting the needs of employers -- **42% of training providers responding to this survey do not track trainee completion and placement rates.** Susan Giordano, CEO of IEMT offered a simple explanation as to why programs do not track results: “Some grants require this information while others do not.” Consequently, when energy-training programs are grant-driven, training institutions measure success by their ability to comply with the grant requirements rather than employer’s workforce needs.

In the age of education reform, failure to track success is almost as great as failure itself. If providers reported high completion and retention rates of their graduates, they could boost their placement rates. Trainees would reap the benefits of expanded employment opportunities, and documentation of a successful track record could help attract new students, funding, and placement opportunities for the training programs. Working with employers could also help training providers target future course offerings by simply asking employers about their top sought-after skills and certifications. The result would be an upward spiral of market-driven courses and certification training, trainees being placed, and employers getting the workforce they need.

There are some model programs that overcome this employer-training provider

disconnect. Jason Smith, Director of Weatherization at the Community Renewal Team (CRT) in Hartford, has been offering weatherization and energy auditing training to low-skilled workers. Placement rates for his trainees are very high and he accounts for this success due to the regularly scheduled Jobs Club program. The club puts employers and trainees together in a casual environment easing the formalities of a later job interview. CRT has adopted other tactics to enhance communication with employers, including regular surveys of employer partners to formally determine what kind of skills they need.

Finding V: Employers are relying on temporary workers to fill job openings.

The

Employer Survey revealed that **more than half (55%) of employers used temporary workers**, and two-thirds of those who did employed one or two temporary workers at any given time. Over three-quarters retained them for more than one month.

The survey and interviews revealed several reasons for the high use of temporary workers. First, and foremost, employers indicated that they were reluctant to hire in an uncertain economy that may require them to layoff new hires when business doesn't pick up.

Secondly, employers can determine if the person is a good fit and capable during the three-month period of time that the typical temporary employee works at the company before being hired. As Lois Krause, Human Resources Director of Capewell explained, "No one can hold his breath for three months. They start to come in late...better to find out before we hire them. They cost 40% more but it's worth it, we don't have to bear the benefits or unemployment costs."

Other cost-saving aspects to using temporary workers include screening of basic skills and background checks. For a variety of contracting jobs, temporary workers provide employers a clear short-term employment option. Some employers cited temporary agencies as a good way for entry-level workers to get their foot in the door in the energy industry.

Finding VI: Transportation and childcare are top barriers to program completion and job placement among trainees.

The survey asked training providers if they offered services to overcome transportation as well as other barriers. Only three institutions reported assistance with this service. Julie Ackerman, Director of Planning at Community Renewal Team provided insight. She said, that for trainees "...having a case manager increases success... they help trainees obtain drivers licenses and even get cars through the Good News Garage."¹³

Todd Renz of ORL (Owens, Renz and Lee, Inc) reported addressing transportation issues with his employees by covering costs if they have to travel more than 60 miles to a job site. John Greeno of New England Conservation Services, solved transportation problems by using his own trucks loaded with equipment necessary for energy auditing and energy efficiency improvements. Employees use the trucks to get to work sites.

Childcare was the next most frequently cited barrier to program completion and placement. However, in the energy sector training providers and employers agreed that

¹³ The Good News Garage is a car charity. Its mission is to create economic opportunity by providing affordable and reliable transportation options to people in need.

the workforce is heavily male-dominated and that childcare was not as big an issue for them as for employers in the [female-dominated] health sector. On a write-in item on the Employer Survey, respondents noted a ratio of male to female entry-level workers in the 80:15 or greater range.

Other barriers to training and placement are summarized in the chart below.

Training	Placement
82% Transportation-related	53% Transportation-related
76% Childcare related	26% Childcare related
64% Language barrier	21% Past criminal record
50% Time of class	26% Other
60% Past criminal record (5 responses)	11% Cost of training

From the Training Provider Survey: **Barriers to Completion of Training and Job Placement**

Finding VII: Recruitment and training of older workers, younger workers and women should be tailored to their strengths and the needs of the energy workforce.

The Employer Survey indicated that the vast majority of energy sector entry-level workers were less than 30 years of age. Employers and training providers reported relatively few women in entry-level positions. Flavia Barbosa of Santa Energy noted that the physical labor could be hard on a female however, she agreed with several other energy efficiency employers that having women in the field was good for business because they brought in better customer service skills. Some employers liked to send women and men teams together, one to literally do the heavy lifting, the other to crawl into small spaces, and handle the customers with finesse.

Characteristics of Entry-Level Energy Sector Workers
<ul style="list-style-type: none"> • Young: 87% under 30 yrs, of which over half between 22-24 yrs. • GED or High School Diploma • Full-time: 84% • 60% earn \$10-15 • Male: female ratio is estimated at 85:15*

From the Employer Survey *From the Training Provider Survey

Employers face training challenges from both ends of the age spectrum of their workforce. This research showed that **entry-level workers, especially younger ones, need pre-employment training and early work-based education skills to succeed in the energy workforce.** In Interviews with CEOs and human resource officers from companies across the industry, leaders voiced concerns about younger workers not having a work ethic,

ambition for furthering their education and training, nor the customer service skills required for career advancement. Interviews supported survey results regarding lack of basic and pre-employment skills. In general, employer views on younger workers were reflected by Lois Krause of Capewell, "They need to be trained in a work environment. They try to see what they can get away with...showing up late, texting at work. They are also very social. They want to work in a place where there are other young people. "Another employer joked, "We are very strict with younger workers...they can't text while they drive our trucks."

On the flip side some employers saw the positive qualities that young people bring into the energy workforce. According to NU's Dona Cassella, "Young workers work smarter, work less, want flexibility and socialization. They are not afraid of new technology.... If they are climbing poles they need to be fit." A focus group of energy auditor and energy efficiency employers noted that younger workers were easier to train in energy auditing because they learned the new energy efficiency technologies and performed better in physically challenging environments than older workers.

Employers also cited the positive qualities of older workers, some saying that they looked for carpenters or plumbers to retrain for their new green jobs. Dependability, strong employability skills necessary to succeed on the job were skills that employers were eager to have in a new worker. One employer explained that an experienced, mature carpenter would make an ideal building analyst with some training. In general, employers felt that the older workers understand the importance of integrity, ability to get to work on time and willingness to work overtime, a common need among employers in this industry.

There was strong agreement among training providers and employers that soft skills as well as pre-employment skills were, in general, lacking among younger workers. They agreed that the best strategy for building a future workforce would be to start young, while students are in middle and high school. According to Ann Randazzo, Executive Director of the Center for Energy Workforce Development, foundation skills for new technologies are essentially the same: math, reading and workforce readiness. ¹⁴ Preparing youth with these skills offers them and Connecticut's energy employers a brighter future.

¹⁴ State of the Industry, Ann Randazzo, Presentation 2010 Center for Energy Workforce Development Summit, Washington, DC, October 2010

Finding VIII: Leadership and support for energy sector workforce policies are needed on the federal, state and local level to address the fluctuations in the political and economic landscape.

The employer and training surveys indicated three core areas for policy intervention: First, in order to plan, employers need clarity from the government in terms of what energy initiatives are going to be supported through tax credits or grants. They need to have a commitment for funding tied to sound policy, not a two- or four-year election cycle.

Secondly, new policies are needed to incentivize training providers and employers to work together. Local educational programs and employers should be convened to develop programs to meet needs of potential workers and employers.

Thirdly, to avoid remedial training in post-secondary programs, middle and high schools, (including technical high schools) need to be a part of energy workforce development plans. These younger students must be offered career awareness, employability skills and science, technology, engineering and math (STEM) skills as part of their curriculum to prepare them for careers in energy and other new technologies.

Finally, none of this can happen without an intermediary organization that is financially supported and charged with leadership and responsibility for implementing a comprehensive energy workforce development plan for the MetroHartford Region. To accomplish the action steps outlined in this report, the intermediary must have the experience with and connections to energy employers, training providers, middle schools, high schools and other educational institutions, and policymakers.

IV. ACTION STEPS

Based on the recommendations in the Summary Section, there are six main action steps that need to be taken to improve entry-level workforce opportunities in the MetroHartford live and work region. The partnership needed to move this project forward must be comprehensive and inclusive, composed of employers, training providers, community service organizations, leaders of education and training institutions, policymakers, and government and private funding organizations. Action steps recommended include:

1. Establish a clearly identified funded intermediary to ensure that action steps are accomplished and monitored every step of the way.
2. Define the energy sector and clarify the job distribution and needs of the sector. To determine this information, the intermediary should work with the Office of Workforce Competitiveness and Connecticut Department of Labor. The intermediary should work with the New England Clean Energy Consortium, since regional partners can provide better and faster cues as to when the economy may turn around and what its service needs will be. Address inaccuracies in workforce data caused by hiring temporary workers.
3. Provide an ongoing venue for training providers and employers to collaborate on developing employer/market-driven programs that can integrate with and survive beyond stimulus funding. Include temporary agencies as partners in workforce planning activities to help entry-level workers prepare for career advancement within the energy sector.
4. Recognize temporary agencies as employers of record. Introduce temporary agencies to the Get into Energy Revised Energy Competency Model, as a way to better prepare their clients for full-time employment in this sector. may provide options for workers who face barriers to obtaining full-time employment.
5. Establish pipeline programs by convening educational leaders, temporary agencies and other area training providers around programs that prepare students and trainees for energy sector jobs. These include science, technology, engineering and math (STEM), Sustainable Operations Alternative and Renewable Energy Initiative (SOAR), and Center for Energy Workforce development's (CEWD's) Get into Energy programs that emphasizes building competencies and "stackable credentials" (see Appendix D.) Stackable skills should include personal effectiveness, academic competencies and workplace technical competencies. Continue bimonthly meetings of the CTEWDC Career Awareness Subcommittee to ensure continued promotion of these careers.
6. Provide leadership and support for policies that will create opportunities for MetroHartford's low-skilled entry-level workers. Expand the EUWP with experts from Office of Policy and Management and Department of Transportation to address transportation and educational barriers, and a comprehensive, long-term energy workforce strategy that maximizes stimulus dollars targeted for energy workforce development.

We believe that the collaborative model is essential to move unemployed workers and unprepared students into training programs and jobs. Lena Rodriguez, Executive Director of the Community Renewal Team, summed up the need for partnering like this: "*The key to success is our relationships with employers...but we need someone to open the door.*"

We believe that this plan will open new doors to brighter and greener futures through opportunities in this new energy sector.

**APPENDIX A: MEMBERS OF THE ENERGY UTILITY WORKFORCE PARTNERSHIP,
A Committee of the CT Energy Workforce Development Consortium**

Pat Agudow, VP of Administration and Policy Mgmt., OPEL Inc.

Cyndi Billian Stern, Billian Stern Consulting, LLC

Thomas Burns, Director of Training, Northeast Utilities

Iris Calovine, Manager Human Resources, Connecticut Natural Gas

Alice Carrier, Office of Workforce Competitiveness

Craig Clark, C&LM, CL&P

John Dobos, Director, Marketing & Sales, Connecticut Natural Gas

Eric Emet (Jeff Lee), Goodwin College

Dan Garewski, STEM Coach, Capital Workforce Partners

Jason Giulietti, Research Economist, CBIA

Shelly Jewell, Project Director, Connecticut Community Colleges

Sandi Kelly, Human Resources, Proton Energy Systems

Bill Leahy, Chief Operating Officer, Institute for Sustainable Energy

Kate Lennon, ITEC Business Development, Independent Connecticut Petroleum Association

Maria Loitz, Marketing Manager, BVH Integrated Services, Inc.

Raymond Mencio, Education Consultant, Connecticut State Department of Education

Pamela Nabors, Director of One-Stop Services, Capital Workforce Partners

Kim Oliver, Manager, Workforce Solutions, United Way

Beth Piggush, Associate Education & Outreach, CT Clean Energy Fund

Kathy, Queen, State-funded Directors Forum, Wallingford Community Day Care

Judy Resnick, Executive Director, CBIA Education Foundation, Director of Workforce Development & Training, CBIA Education Foundation

Sonya Richmond, Grant Developer, CBIA Education Foundation

Larry Smotroff, Dean of Workforce Develop, Middlesex Community College

Dan Wheatley, AEE/ESC

APPENDIX B: ENERGY AND UTILITY CAREERS- ENTRY-LEVEL OCCUPATIONS IN CT

Correlation of Traditional, Utility, and Green Occupations

*This chart aligns traditional energy occupations with green energy occupations as described and classified on Department of Labor's O*NET Site, <http://www.careeronestop.org/GreenCareers/ExploreGreenCareers.aspx>*

Sources: U.S. Bureau of Labor Statistics Office. Retrieved from www.bls.gov/oco/cg

CT Department of Labor, Office of Research Occupational Projections 2008-22018

* From Institute for Sustainable Energy from Institute of Sustainable Energy list of Bridgeport area green careers (*In italics*)

O*NET OnLine. Careers by Clusters. Retrieved from <http://online.onetcenter.org/find/career?c=1&g=Go>

Green Sector	Occupations	Traditional Utility & Energy Careers Comparison	Employment in 2018 & Job Trends in the Nation from 2008-2018	Employment in 2016 & Job Trends in CT from 2008-2018
		Connecticut Data		Connecticut Data
1. AGRICULTURE, FOOD AND NATURAL RESOURCES	Biofuels Processing Technicians	N/A	N/A	N/A
2. ENERGY AND CARBON CAPTURE AND STORAGE	Power Plant Operator	<ul style="list-style-type: none"> • Power plant operators (216 – 238; 10%) 	25,500-24,800; -2.64	
3. ENERGY EFFICIENCY	1. Boilermakers 2. Maintenance & Repair Workers, General (<i>Building Maintenance Worker</i> •)	<ul style="list-style-type: none"> • Boilermaker • Carpenter (11,166 - 11,309; 1%) • Control/Valve Installers (507 – 566; -1%) • Electrician (7,736 – 7,561; -3%) • Electrical and Electronics Repairers (623 – 640; 3%) • Insulation Worker (308 -310; 1%) 	1. 20,200-24,000; 19% (general) 2. 1,361,300-1,509,200 +11% (general) +8%	1. 386-420 (9%) low growth (general) 2. 58,948 – 60,151 (2%) (general) 3. 4,731 – 5,007 (6%)

	<p>3. Refrigeration Mechanics and Installers</p> <p>4. Custodian/Janitor*</p> <p>5. Green cleaning and building maintenance</p> <p>6. Weatherization and building efficiency technician</p>	<ul style="list-style-type: none"> • Iron Mechanics (can find) • Line-worker (line helper?) • Machinists (9,185 – 8,957; -2%) • Millwright (234 – 224; -4%) • Pipefitter/Plumbers/Steamfitters (5,516 – 5,615; 0%) • Pipeline Installer • Pipe-layer (257 – 269) • Welder Maintenance (Not available) • Substation Mechanic (127 – 155; 22%) • Utility Metering & Regulation Technician (Readers) (150 - 111; -23) • Relay Technician (127 – 155; 22%) • Welder (2,497 – 2,339; -6%) • Weatherization Technician (Not available) 	<p>3. 308,200-394,800 (general)+28%</p> <p>4. 2,375,000 (general) +3-6%</p> <p>5. Not available</p> <p>6. Not available</p>	<p>(general) +9%</p> <p>4. 32,872 – 32,812 (0%) (general)</p> <p>5. Not available</p> <p>6. Not available</p>
4. ENERGY TRADING	N/A needs certification; beyond entry-level	<ul style="list-style-type: none"> • Not applicable 	Not applicable	Not applicable
5. ENVIRONMENTAL PROTECTION	<p>1. Environmental Engineering Technicians</p> <p>2. Environmental Science and Protection Technicians</p> <p>3. Maintenance and Repair Workers, General</p> <p>4. Hazardous Materials Removal Workers/ <i>Lead Paint Abatement</i></p> <p>5. <i>Environmental Construction Project Worker*</i></p>	<ul style="list-style-type: none"> • Water & liquid waste <ul style="list-style-type: none"> ○ treatment plant and system operators (601 – 640; 6%) • Clarifying-Plant Operator, Pump-Station Operator (184-207; 13%) • Waterworks, Waste-Treatment Operator (601 – 640; 6%) • Wastewater-Treatment-Plant Operator (601 – 640; 6%) 	<p>1. 21,200-27,000; +30</p> <p>2. 35,000-45,200; +29%</p> <p>3. 1,361,300-1,509,200 +11% (general) +8%</p> <p>4. 42,500-48,800; +15%</p> <p>5. Not available</p>	<p>1. 291 – 335; 15%</p> <p>2. 298 – 317, 6%</p> <p>3. 4,731-5007, 6%</p> <p>4. 398 – 373; -4%</p> <p>5. Not available</p>

	6. Rain garden Construction and Maintenance worker		6. Not available	6. Not available
	7. Recycling Collections Operator		7. Not available	7. Not available
	8. Recycling Collections Driver		8. Not available	8. Not available
	9. Rain Barrel installation		9. Not available	9. Not available
6. GOVERNMENT & REGULATORY ADMINISTRATION	1. Inspectors, Testers, Sorters, Samplers, and Weighers 2. Energy Auditor	Not applicable	1. 464,700-447,800; -4 2. Not available	1. 7,783 – 7,361; -5% 2. Not available
7. GREEN CONSTRUCTION	1. Architectural Drafters 2. Boilermakers 3. Construction Carpenters 4. Construction Laborers 5. Hazardous Materials Removal Workers 6. Carpenters Helpers 7. Laborers and Freight, Stock, Material Movers, Hand 8. Maintenance, Repair Workers 9. Pipe Fitters &	<ul style="list-style-type: none"> • Boilermaker • Carpenter (11,166 - 11,309; 1%) • Control & Valve Installers (570 – 566; -1%) • Electrician (507 – 566; -1%) • Electrical and Electronics Repairers • Insulation Worker (308 -310; 1%) • Iron Mechanics • Line-worker (line helper?) • Machinists (9,185 – 8,957; -2%) • Millwright (234 – 224; -4%) • Pipefitter/Plumbers/Steamfitters (5,516 – 5,615; 0%) • Pipeline Installer (Not available) 	1. 251,900-262,500; +4L% 2. 20,200-24,900; +19% (general) 3. 1,284,900-1,450,300; +13% (general) 4. 1,248,700-1,504,600; +20% 5. 42,500-48,800; +15% 6. 21,390 7. 2,35,790 8. 1,361,300-1,509,200 +11% (general) +8%	1. 902 -877; -3% 2. Not available 3. 11,166 – 11,309; 1% 4. Construction helpers: 515 – 551; 7% 5. 398 – 373; -4% 6. Construction helpers: 514 – 551; 7% 7. 23,471 – 22,100; -6% 8. 58,948 – 60,151 (2%)

<p>Steamfitters 10. Plumbers 11. Power Plant Operator 12. Refrigeration Mechanics and Installer 13. Rough Carpenters 14. Sheet Metal Workers 15. Solar photovoltaic journeyman/electricianⁱ 16. Structural Metal Fabricators and Fitters 17. Welders, Cutters, and Welder Fitters 18. <i>Weatherization Technician/* Caulking and Weatherization Technician</i> 19. <i>Efficient Water Use Installer</i> 22. <i>Efficient Windows Installer</i> 23. <i>Efficient Insulation Installer</i> 24. <i>Green Plumber Installer and maintenance</i> 25. <i>Welder Helper</i> 26. <i>Construction material recycler</i> 27. <i>Roofing and skylight installer</i> 28. <i>Deconstruction Workers</i></p>	<ul style="list-style-type: none"> • Pipe-layer (257 – 269) • Welder Maintenance • Substation Mechanic (127 – 155; 22%) • Weatherization Technician (Not available) 	<p>9. 494,700-570,000 +15% (general) 10. See above 11. 36,860 12. 308,200-394,800; +28% 13. 1,284,900-1,450,300 (general) 14. 39,700-38,000; -4.08 15. Not available 16. 111,620 17. 494,700-570,000; -2% 18. 29 Not available</p>	<p>9. 5,516 – 5,615; 0% (Plumbers, pipefitters and steamfitters) 10. See above 11. 216 – 238; 10% 12. 4,731 – 5007; 6% general 13. Not available 14. 2,127 – 2,000; -6% 15. Not available 16. 2,112 – 2,218; 5% 17. 2,497 – 2,339; -6% 18 - 29 Not available</p>
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	<i>29. Solar thermal hot water insulation and maintenance</i>			
8. MANUFACTURING	<ol style="list-style-type: none"> 1. Millwright 2. Sheet Metal Workers 3. Structural Metal Fabricators and Fitters 4. Welders, Cutters, and Welder Fitters 	<ul style="list-style-type: none"> • Boilermaker • Carpenter (11,166 - 11,309; 1%) • Control & Valve Installers (570 - 566; -1%) • Electrician (507 - 566; -1%) • Electrical and Electronics Repairers • Insulation Worker(308 -310; 1%) • Iron Mechanics (480 - 459; -4%) • Line-worker (884 -879; -1%) general • Machinists (9,185 - 8,957; -2%) • Millwright (234 -244; -4%) • Pipefitter/Plumbers/Steamfitters (5,516 - 5,615; 0%) • Pipeline Installer • Pipe-layer (257 - 269) • Welder Maintenance (• Substation Mechanic (127 - 155; 22%) • Utility Metering & Regulation Technician (150 - 116; -23%) • Relay Technician (127 - 155; 22% general) • Welder (2,497 - 2,339; -6%) • Weatherization Technician (Not available) 	<ol style="list-style-type: none"> 1. 19,200-16,600; -13.85 2. 39,700-38,000; -4.08 3. 95,000 -92,600; -2.62 4. 256,300-240,400; -6.19 	<ol style="list-style-type: none"> 1. 234 - 224; -4% 2. 2,127 - 2,000; -6% 3. 2,112 - 2,218; 5% 4. 2,497 - 2,339; -6%
9. RECYCLING AND WASTE REDUCTION	<ol style="list-style-type: none"> 1. Recycling Coordinators 2. Refuse and Recyclable Material Collectors 	Not applicable	<ol style="list-style-type: none"> 1. Not available 2. 128,940 (2008 only, no projection available) 	<ol style="list-style-type: none"> 1. Not available 2. 1,690-1,730; +2%
10. RENEWABLE ENERGY GENERATION	<ol style="list-style-type: none"> 1. Biofuels Processing 		<ol style="list-style-type: none"> 1. Not available 	<ol style="list-style-type: none"> 1. Not available

	<p>Technicians</p> <p>2. Biomass Plant Technicians</p> <p>3. Geothermal Technicians</p> <p>4. Hydroelectric Plant Technicians</p> <p>5. Maintenance and Repair Workers, General</p> <p>6. Methane/Landfill Gas Generation System Technicians</p> <p>7. Sales and Marketingⁱⁱ (customer sales representatives)</p> <p>8. Sheet Metal Workers</p> <p>9. Solar Thermal Installer and Technicians</p> <p>10. Wind Turbine Service Technician</p>		<p>2. Not available</p> <p>3. Not available</p> <p>4. Not available</p> <p>5. 5,136,130-1,509,200 +11% (general) +8%</p> <p>6. Not available</p> <p>7. 2,252,400-2,65,900, +18% (general)</p> <p>8. 2,127-2,000; +6%</p> <p>9. Not available (under plumbers)</p> <p>10. Not available</p>	<p>2. Not available</p> <p>3. Not available</p> <p>4. Not available</p> <p>5. 58,948 – 60,151 (2%)</p> <p>6. Not available</p> <p>7. Not available specific to this industry</p> <p>8. 2,127 – 2,000; -6%</p> <p>9. Not available</p> <p>10. Not available</p>
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APPENDIX C: FUNDS AWARDED TO STATE AGENCIES

CT State Agency	Program Name	Description	Amount Awarded
Dept. of Social Services	Weatherization Assistance Program	ARRA Supplemental Funding for the Weatherization Assistance Program (WAP): To reduce energy costs for low-income families, particularly for the elderly, people with disabilities, and children, by improving the energy efficiency of their homes while ensuring their health and safety	\$64,310,502
Office of Policy & Management	Electricity Delivery And Energy Reliability, Research, Development	The purposes of the EA initiative are to: 1) strengthen and expand State energy assurance planning and resiliency efforts, 2) create jobs, and, 3) build-in house State energy assurance expertise. Additionally, the initiative will support the building of regional energy assurance capability to allow the State to better coordinate and communicate state-wide, and with other states, on energy security, reliability and emergency response issues. Significant deliverables for this initiative include: Project Management Plan (PMP); Workforce Development Plan (WDP); Energy Supply Disruption Tracking Process (ESDTP); Energy Assurance Plan, both Initial and Final (EAP); Energy Assurance Exercises, both Intra- and Inter- State (EAE); and, Energy Assurance Exercises after Action Reports, both Intra- and Inter- State (EAE AAR). Results for this initiative will be assessed by: number of energy assurance plans created or substantially revised; number of jobs created within State government agencies for energy assurance planning and response capabilities; number of energy assurance training sessions, workshops and/or exercises conducted; and, number of people trained.	\$521,250
	Energy Efficiency And Conservation Block Grant	The purpose of this grant is to provide sub-grants to 142 Connecticut Municipalities not eligible for direct grants from U.S. DOE. Entry-level jobs may result from opportunities under this grant that 1) reduce fossil fuel emissions, maximizing benefits for local and regional communities; 2) reduce total energy use of the eligible entities; and 3) improve energy efficiency in the building sector, the transportation sector and other appropriate sectors.	\$9,593,500
	State Energy Efficient Appliance Rebate Program	State Energy Efficient Appliance Rebate Program (SEEARP) is to be used to support the states new rebate program for residential ENERGY STAR appliance products. Connecticut's allocation is approximately \$3.4 million.	\$3,359,000

CT State Agency	Program Name	Description	Amount Awarded
	State Energy Program	State Energy Program purpose is to promote the adoption of energy efficiency and renewable energy technologies in multiple sectors including: Building Code training and compliance; Building Operator Training; Clean Cities program support; large commercial and industrial energy efficiency opportunities; small business energy efficiency opportunities, residential audits and efficiency opportunities; State building energy improvements, and incentives to promote the following kinds of installations on commercial and residential facilities: solar thermal systems, solar photovoltaic systems, geothermal heat pump systems; and fuel cell installations (commercial only). Piggybacking with existing program efforts in the state was a priority. Deliverables will include energy savings and greenhouse gas reductions.	\$38,542,000
Public Utility Control Dept	Electricity Delivery And Energy Reliability, Research, Dev.	State electricity regulator assistance	\$839,241
Energy Total			\$117,165,493

Funds Awarded Directly from the Federal Government to Entities in Connecticut (Note: The State is not responsible for the expenditure, tracking, or reporting these funds)	
Advanced Energy Manufacturing Tax Credits	\$120,911,520
Electric Drive Vehicle Battery/Components	\$5,000,000
Energy Efficiency and Conservation BG	\$14,929,400
Enhanced Geothermal Systems (EGS) Components Research & Development/Analysis	\$4,267,521
Ground Source Heat Pump Demonstration Projects	\$146,973
Local Energy Assurance Planning Initiatives	\$255,587
Smart Grid	\$9,188,050
Solar Energy Grid Integration	\$1,500,000
Energy Efficiency and Conservation Block Grant	\$4,171,124
Energy Total	\$160,370,175
Green Capacity Building Grants	\$129,827
State Energy Sector Partnership (SESP) and Training Grants	\$3,360,000
Labor Total	\$3,489,827

Source: <http://www.recovery.ct.gov/recovery/cwp/view.asp?a=3704&q=436444>

http://apps1.eere.energy.gov/states/state_specific_information.cfm/state=CT

Congressman John B. Larson (*CT-01*), Chairman of the House Democratic Caucus praised the House of Representatives today for passing legislation that will make important investments in Connecticut's energy and science industries. The Energy and Water Appropriations Bill, which will now go on to the Senate and then be signed into law by President Obama, increases funding for hydrogen energy technologies, provides \$2.5 million for the University of Connecticut's Global Fuel Center and invests in key science education programs.

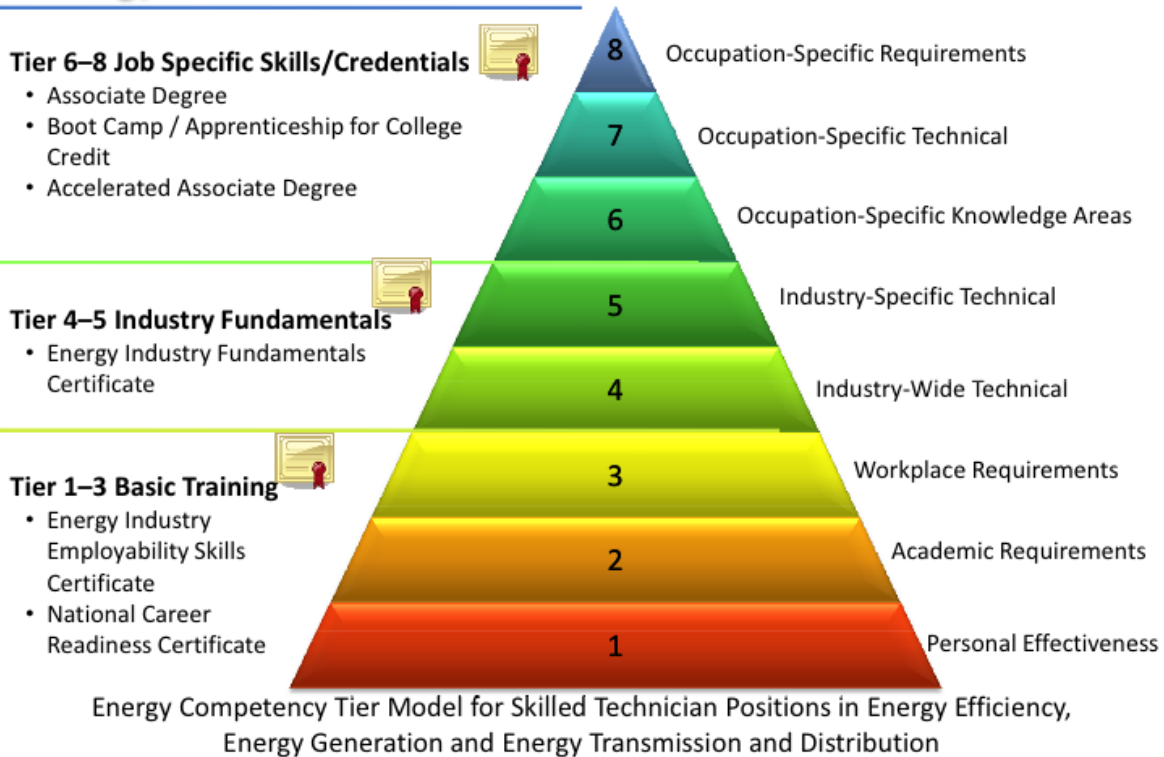
- \$2.5 million for the Global Fuel Center at the University of Connecticut to accelerate its research and development of fuel cell technology – one of the fastest growing industries in Connecticut.
- \$750,000 for the State University System's Nanotechnology Initiative to build an advanced nanotechnology program for education and research.
- \$500,000 for the Smart Energy Program at the Connecticut Science Center to teach Connecticut's students about the potential of energy efficient technologies.

http://www.larson.house.gov/index.php?option=com_content&task=view&id=958&Itemid=18

APPENDIX D: GET INTO ENERGY STACKABLE CREDENTIALS

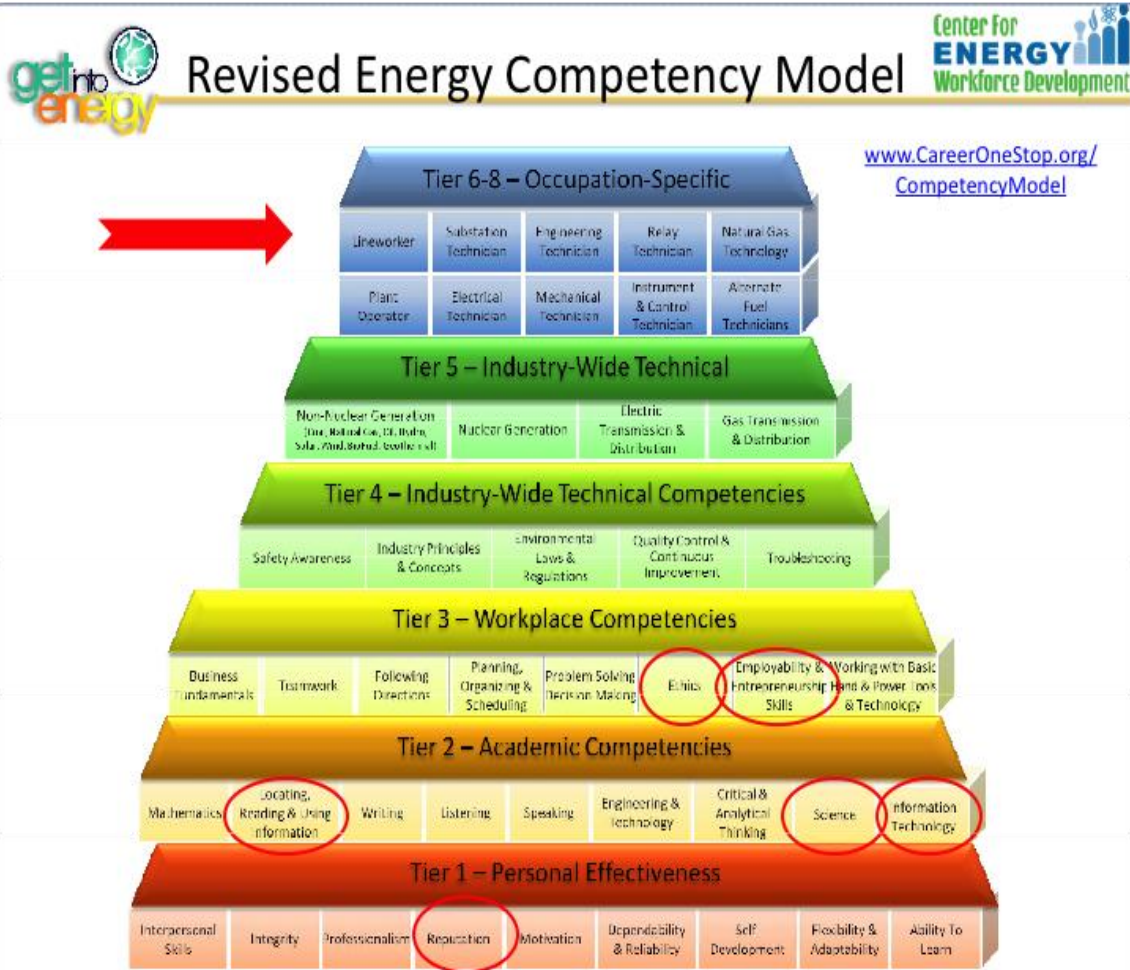


Stackable Credentials



From the Center for Energy Workforce Development. State of the Industry, Presentation by Ann Randazzo for CEWD's 2010 Conference, Washington, DC.

APPENDIX E: GET INTO ENERGY COMPETENCY MODEL



From the Center for Energy Workforce Development, State of the Industry, Presentation by Ann Randazzo, for CEWD’s 2010 Conference, Washington, DC.

**Strategies for Building Connecticut's Energy Career Pipeline:
Creating Pathways for the Entry-Level Worker**

A report by CT Business & Industry Association Education Foundation
350 Church Street
Hartford CT 06103
for Workforce Solutions Collaborative of MetroHartford
November 2010

For additional information please contact
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