

# Bridgeport Region Green Jobs Report



May 2009

## **BACKGROUND**

In January 2008, The WorkPlace, Inc., Southwestern Connecticut's Regional Workforce Development Board, was contracted by the City of Bridgeport and the Greater Bridgeport Community Enterprises, Inc., also know as the "Green Team," to examine the growing occupations in emerging Green industries in the Bridgeport region. Funding for this report was made possible by the City of Bridgeport's Central Grants office and the United Illuminating (UI) Company.

The Center for Capacity Development, and the newly formed Blue Green Research Institute, are divisions of The WorkPlace, Inc. The Center was contracted to develop the following report and conduct the necessary research and data analysis to aid in the on-going planning efforts.

The Center performed a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis to identify Green occupations and industries, and offer projections concerning which areas will have the greatest need for trained workers to fill new and replacement jobs in the next 10 years.

On April 25, 2008, the Center presented its preliminary findings to a diverse audience of community groups, environmental activists, political leaders and academics. A copy of the presentation may be found in Attachment A.\* Mayor Bill Finch welcomed the assembled group to the event and outlined his administration's plans to make Bridgeport "The Greenest City in Connecticut." Rina Bakalar, then District Director to former Congressman Christopher Shays, also spoke about the importance of Green issues in the region. John Olsen, President of the Connecticut AFL-CIO stressed the important role unions play in the "Green Wave." The event also featured a reaction panel of local experts on the Green topic and included: Lise Dondy, President, Connecticut Clean Energy Fund; Dr. Marian Evans, Director of Health and Social Services, City of Bridgeport; Adam Ney, AuctorVerno, LLC/CBIA; Shay Atluru and Graham Curtis, Diversified Technology Consultants, Inc. and Adrienne Farrar Houel, Greater Bridgeport Community Enterprises, Inc.

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Since the commission of this study, Bridgeport Mayor Bill Finch has created B-Green\*, a sustainability taskforce focusing on many areas of urban environmental quality, including the development of Green jobs. It is hoped that by adopting a sustainability plan it will assist the region to direct citywide initiatives in infrastructure, energy systems, building and urban planning toward promoting and creating new jobs. Green jobs tend to be local because many involve work transforming and upgrading the immediate built and natural environment, such as retro-fitting buildings, installing solar panels, constructing transit lines, and landscaping. The B-Green taskforce is chaired by Bridgeport Regional Business Council President Paul Timpanelli and includes representatives of business, education and environmental entities.

Across the state of Connecticut, Gov. M. Jodi Rell launched OneThingCT\* in early 2008 to encourage energy efficiency and sustainability in Connecticut. Several public awareness and home/business incentive programs were launched under the OneThing umbrella. The Institute for Sustainable Energy based at Eastern Connecticut State University also made building a green-collar workforce in the state of Connecticut a main component of its 2009 legislative agenda.\*

In January 2009, the U.S. Department of Labor awarded the Connecticut Community Colleges a \$2 million grant toward the "Sustainable Operations: Alternative and Renewable Energy" (SOAR) Initiative,\* to increase statewide capacity to train workers for careers in a group of fields considered "sustainable operations," including environmental technology, alternative energy, automotive technology, building performance, clean water and geothermal. South Western Connecticut is home to two Community-Technical Colleges: Norwalk Community College and Housatonic Community College.

In April 2009, Legislative leaders in the Connecticut General Assembly convened a Green Energy Jobs Forum where the Phase 1 results of the Connecticut Renewable Energy/Energy Efficiency (RE/EE) Economy Baseline Study were revealed. The major points included that most EE jobs are service-based, while any renewable energy jobs

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(mostly manufacturing of fuel cells and some solar energy) are concentrated in a few companies doing business in Connecticut. Those industries and companies benefit from publicly-funded subsidies and initiatives to grow.

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Connecticut, and the entire nation, is awakening to find a sleeping giant in their midst and that giant is Green. Yes, a Green Giant. Think not about the cartoon figure of canned vegetables fame, but of the thousand of jobs, industries and opportunities that will be impacted by the Green Wave that is washing over the United States.

Even before he won the 2008 election, President Barack Obama pledged federal investment to establish a Green economy and create up to 5 million new jobs over the next two decades. The American Recovery & Reinvestment Act (ARRA) has earmarked \$500 million toward Green Job development initiatives.\* Other ARRA allocations include stipulations for training set-asides.

This report will provide basic information on what jobs can be considered Green in the Greater Bridgeport region, including projections of growth from 2008 through 2018 using the latest information available. It will also provide an overall regional landscape of Green industries combined and the occupations which make them run.

Beyond quantifying occupations, we will also provide analysis on which occupations have the most incidence of cross-over among Green industry sector; which sectors have the potential for the most occupations to fall within them (construction); a range of average and median hourly wages; and the level of training or education required.

Lastly, this report will list recommendations for how the region can respond to its needs, using existing resources as well as suggested new initiatives. The intent of this analysis is

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to provide quantitative information that can be used to plan and implement training and education programs.

### **LIST OF TABLES (FIGURE AND PAGE #)**

## **GREEN JOBS IN THE GREATER BRIDGEPORT REGION**

The numbers discussed in this report cover the Greater Bridgeport region, consisting of the following municipalities: Bridgeport, Trumbull, Easton, Fairfield, Monroe and Stratford.

Green jobs can broadly be defined as those that promote Energy Efficiency (EE) and Renewable Energy (RE) strategies. Jobs range from low-skill, entry-level positions to high-skill, higher-paid jobs. Many involve work transforming and upgrading the immediate built and natural environment. Some are new occupations. Most are existing jobs that demand new skills or materials.

The most widely accepted list of Green Job economic investment industries was developed by the Center for American Progress and the Political Economy Research Institute at the University of Amherst, Mass. The six categories which cover the entire United States are below.\* Within each of these six categories, many new and traditional jobs may fall.

- Building Retrofitting and Weatherization
- Mass Transit/Freight Rail
- Smart Electrical Grid/Transmission Systems
- Wind Power
- Solar Power
- Advance Bio-Fuels

Under the SOAR (Sustainable Operations: Alternative and Renewable Energy) Initiative, the Connecticut Community Colleges will be focusing on increasing statewide capacity to train workers for careers in what it calls “sustainable operations,” including environmental technology, alternative energy, automotive technology, building performance, clean water and geothermal. Several of these areas are covered under the

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six main categories listed above. Others can be analyzed separately and will be done so below including:

- Clean Water
- Automotive Technology
- Environmental Technology

An occupational analysis of the Farming and Fishing industries is included, as well as a look at the Fuel Cell Technology industry, the manufacturing aspect of which originated in Connecticut, but has not expanded beyond a few key companies which are not located in Southwestern Connecticut.

The following tables and analysis are based on modeling performed with the most recent data available (Fall 2008). It is noted with each section that with new ARRA funding there is opportunity available through both formula funding and competitive opportunities for investment in Green industries, and in some cases associated job training and education.

**Building Retrofitting and Weatherization**: The occupational breakdown below shows occupations found in the industries which perform building retrofitting and weatherization work.

Building retrofitting and Weatherization work do overlap in terms of the industries they will impact, however they differ in that ARRA funding will be allocated under different federal and state agencies. In addition, building retrofitting work involves major systems retrofitting of commercial, industrial or publicly-owned buildings whereas weatherization is residentially-focused and entails work to ensure structural energy efficiency. Building retrofitting is also expected to draw more heavily for those occupations requiring a higher level of training and education than what will typically be required to perform weatherization work. The analysis of occupations within building retrofitting and weatherization-related industries shows an increase in the Green

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Bridgeport Region of **762\*** jobs by 2018, from 4,846 in 2008 to 5,609 jobs across 24 top occupations. Of those, **1,556** are projected to be new or replacement jobs in that time frame.

SOC Code	Building Retrofitting/Weatherization	2008 Jobs	2018 Jobs	Change	% Change	New & Rep. Jobs
11-9021	Construction managers	681	839	158	23%	265
47-2021	Brickmasons and blockmasons	90	107	17	19%	36
47-2031	Carpenters	1,248	1,483	235	19%	407
47-2041	Carpet installers	36	44	8	22%	14
47-2051	Cement masons and concrete finishers	66	75	9	14%	28
47-2053	Terrazzo workers and finishers	10	13	3	30%	6
47-2061	Construction laborers	949	1,113	164	17%	236
47-2073	Operating engineers and other construction equipment operators	297	324	27	9%	85
47-2081	Drywall and ceiling tile installers	53	63	10	19%	18
47-2082	Tapers	44	54	10	23%	16
47-2111	Electricians	449	508	59	13%	179
47-2121	Glaziers	37	42	5	14%	11
47-2131	Insulation workers, floor, ceiling, and wall	<10	<10	--	--	--
47-2161	Plasterers and stucco masons	13	16	3	23%	6
47-2181	Roofers	92	110	18	20%	39
47-2221	Structural iron and steel workers	22	23	1	5%	8
47-3012	Helpers, carpenters	40	42	2	5%	12
47-3013	Helpers, electricians	31	34	3	10%	11
47-4011	Construction and building inspectors	76	82	6	8%	20
47-4021	Elevator installers and repairers	<10	<10	--	--	--
47-4091	Segmental pavers	<10	<10	--	--	--
49-9021	Heating, air conditioning, and refrigeration mechanics and installers	368	412	44	12%	110
53-7021	Crane and tower operators	14	14	0	0%	3
53-7051	Industrial truck and tractor operators	213	193	(20)	(9%)	41
		<b>4,846</b>	<b>5,609</b>	<b>762</b>	<b>16%</b>	<b>1,556</b>

Source: EMSI Complete Employment - Fall 2008

**\*Note:** As of April 2009, the State of Connecticut, Department of Social Services, the designated state grantee for the federal Weatherization and Assistance Program (WAP) will receive from the federal Department of Energy an amount of \$64.3 million, to be used by March 31, 2012. DSS has allocated \$500,000 for training and technical assistance.\* (ARRA, WAP, Proposed CT State Plan) The jobs figure cited above is based on projection made prior to ARRA funds being allocated. The state of Connecticut projects the infusion of these funds will generate 640 new or replacement jobs statewide. An impact assessment of how the Green Bridgeport region will be impacted by these new funds can be performed only after the total number of units to be weatherized and amount of funds earmarked for this region of Connecticut is determined by the state.

**Mass Transit/Freight Rail:** The occupational breakdown below shows occupations that are found in industries which perform work developing mass transit and freight rail systems. These occupations are associated with expanding mass transit systems (for example, bus, light or commuter-rail and subway services) and with significant public investment in freight rail networks, through both construction and operations, maintenance and expansion of services in urban, suburban and rural settings.

The analysis of occupations within Mass Transit/Freight-Rail-related industries shows an increase in the Green Bridgeport Region of **630** jobs by 2018, from 4,531 in 2008 to 5,161 jobs across 18 top occupations. Of those, **1,378** are projected to be new or replacement jobs in that timeframe.

SOC Code	Mass Transit/Freight Rail	2008 Jobs	2018 Jobs	Change	% Change	New & Rep. Jobs
11-9021	Construction managers	681	839	158	23%	265
17-2051	Civil engineers	192	198	6	3%	57
17-3022	Civil engineering technicians	25	24	(1)	(4%)	4
43-5032	Dispatchers, except police, fire, and ambulance	156	150	(6)	(4%)	34
47-2031	Carpenters	1,248	1,483	235	19%	407
47-2061	Construction laborers	949	1,113	164	17%	236
47-2073	Operating engineers and other construction equipment operators	297	324	27	9%	85
47-2111	Electricians	449	508	59	13%	179
47-2221	Structural iron and steel workers	22	23	1	5%	8
47-4061	Rail-track laying and maintenance equipment operators	<10	<10	--	--	--
51-2031	Engine and other machine assemblers	<10	<10	--	--	--
51-2041	Structural metal fabricators and fitters	53	50	(3)	(6%)	7
51-4121	Welders, cutters, solderers, and brazers	110	120	10	9%	34
53-3021	Bus drivers, transit and intercity	102	98	(4)	(4%)	9
53-4019	Locomotive engineers and operators	<10	<10	--	--	--
53-4031	Railroad conductors and yardmasters	<10	<10	--	--	--
53-7021	Crane and tower operators	14	14	0	0%	3
53-7051	Industrial truck and tractor operators	213	193	(20)	(9%)	41
		<b>4,531</b>	<b>5,161</b>	<b>630</b>	<b>14%</b>	<b>1,378</b>

Source: EMSI Complete Employment - Fall 2008

It should be noted that this analysis was performed before the stimulus spending plan for ARRA infrastructure projects has been finalized for the state of Connecticut. Projects which seek to improve or expand the use and availability of mass transit and freight rail in the region, and which will likely be funded under a number of funding streams managed by the Department of Transportation, may have in impact on job projections. Some funding is at the discretion of Congress, including Capital Investment Grants for projects ready to start (for example, light rail, commuter rail or bus and high-occupancy-vehicle (HOV) facilities). Connecticut will receive additional allocations based on existing formulas. For example, Transit Capital Assistance has the potential for \$105.5 million for

Connecticut. Connecticut DOT and the Recovery Act Working Group is in the process of reviewing transportation and all other categories of proposals projects to be funded with ARRA dollars. An updated analysis of the jobs that may be created based on the value of the economic investment associated with them can be performed once a plan is finalized.

**Smart Electrical Grid/Transmission Systems:** The occupational breakdown below shows occupations that are found in industries which perform work developing smart electrical grid or transmission systems. These occupations are associated with projects which combine advances in information technology with innovations in power system management to create a more efficient distribution system for electrical energy. “Smart Grid” is shorthand for operating the nation’s electricity transmission and distribution system using advanced digital technology.

The analysis of occupations within Smart Electrical Grid/Transmission Systems-related industries shows an increase in the Green Bridgeport Region of **355** jobs by 2018, from 4,025 in 2008 to 4,379 jobs across 13 top occupations. Of those, **1,057** are projected to be new or replacement jobs in that timeframe.

SOC Code	Smart Electrical Grid/Transmission Systems	2008 Jobs	2018 Jobs	Change	% Change	New & Rep. Jobs
11-9021	Construction managers	681	839	158	23%	265
15-1031	Computer software engineers, applications	357	434	77	22%	128
15-1032	Computer software engineers, systems software	211	229	18	9%	49
17-2071	Electrical engineers	95	92	(3)	(3%)	20
17-3022	Civil engineering technicians	25	24	(1)	(4%)	4
17-3023	Electrical and electronic engineering technicians	85	80	(5)	(6%)	13
17-3024	Electro-mechanical technicians	17	16	(1)	(6%)	3
47-2061	Construction laborers	949	1,113	164	17%	236
47-2073	Operating engineers and other construction equipment operators	297	324	27	9%	85
49-9051	Electrical power-line installers and repairers	48	50	2	4%	18
51-2022	Electrical and electronic equipment assemblers	198	142	(56)	(28%)	42
51-2092	Team assemblers	599	580	(19)	(3%)	112
51-4041	Machinists	462	457	(5)	(1%)	83
		<b>4,025</b>	<b>4,379</b>	<b>355</b>	<b>9%</b>	<b>1,057</b>

Source: EMSI Complete Employment - Fall 2008

Pilot projects for Smart Grid/Transmission systems design, planning and development are being considered throughout the country. Connecticut may have the opportunity to

apply federal formula dollars to be administered by the U.S. Department of Energy toward such initiatives under a State Energy Program to be managed by the Office of Policy & Management (OPM) for up to approximately \$39 million. It is unclear if Energy Efficiency & Conservation Block Grants, with a pool of \$400 million on a competitive basis, can be applied to Smart Grid/Transmission systems projects. There is also \$4.5 billion in the ARRA for Smart Grid Investment Program, including Worker Training, under the Department of Energy, Office of Electricity Delivery and Energy Reliability. The funds will be distributed under a regional demonstration initiative, plus a matching grant program for smart grid investments.

**Wind Power:** The occupational breakdown below shows occupations that are found in industries which perform work in the renewable energy area of wind technology. Components of the wind industry include power plants and manufacturing facilities that produce wind turbines, blades, electronic components, gearboxes, generators, and a wide range of other equipment, and installation specialists.

The analysis of occupations within Wind Power-related industries shows an increase in the Green Bridgeport Region of **66** jobs by 2018, from 2,867 in 2008 to 2,933 jobs across 16 top occupations. Of those, **754** are projected to be new or replacement jobs in that timeframe.

SOC Code	Wind Power	2008 Jobs	2018 Jobs	Change	% Change	New & Rep. Jobs
11-3051	Industrial production managers	150	142	(8)	(5%)	54
11-9021	Construction managers	681	839	158	23%	265
17-2081	Environmental engineers	23	26	3	13%	10
17-3025	Environmental engineering technicians	<10	<10	--	--	--
47-2073	Operating engineers and other construction equipment operators	297	324	27	9%	85
47-2211	Sheet metal workers	98	108	10	10%	35
47-2221	Structural iron and steel workers	22	23	1	5%	8
49-2094	Electrical and electronics repairers, commercial and industrial equipm	50	53	3	6%	20
49-9044	Millwrights	<10	<10	--	--	--
51-1011	First-line supervisors/managers of production and operating workers	513	486	(27)	(5%)	87
51-2022	Electrical and electronic equipment assemblers	198	142	(56)	(28%)	42
51-2023	Electromechanical equipment assemblers	94	77	(17)	(18%)	9
51-4035	Milling and planing machine setters, operators, and tenders, metal an	36	31	(5)	(14%)	7
51-4041	Machinists	462	457	(5)	(1%)	83
53-7021	Crane and tower operators	14	14	0	0%	3
53-7051	Industrial truck and tractor operators	213	193	(20)	(9%)	41
		<b>2,867</b>	<b>2,933</b>	<b>66</b>	<b>2%</b>	<b>754</b>

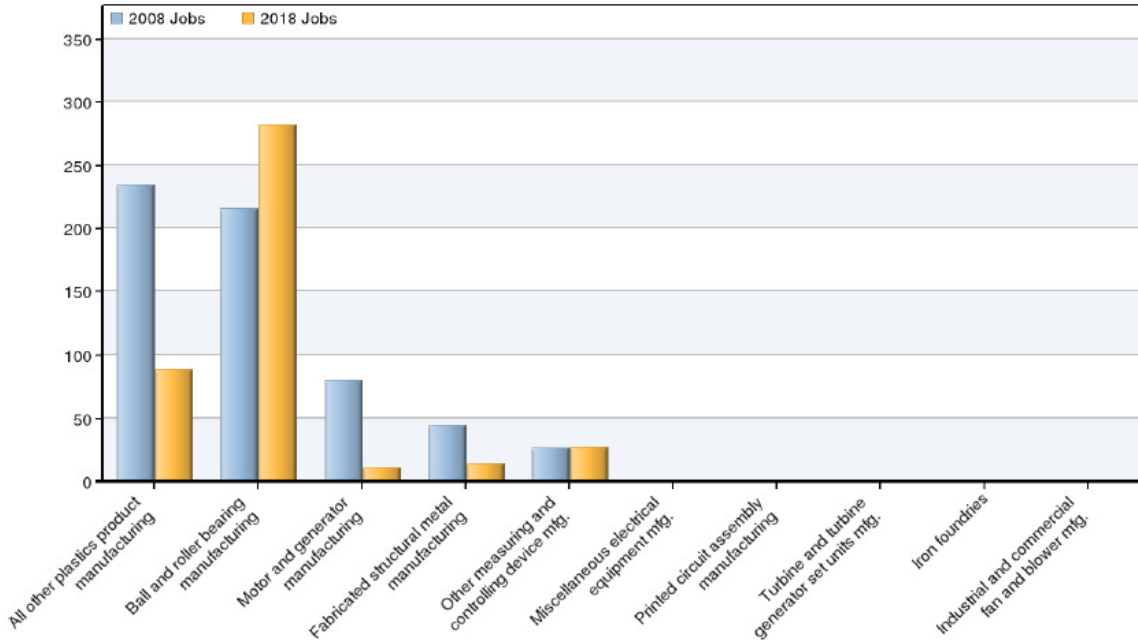
Source: EMSI Complete Employment - Fall 2008

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A report by the Renewable Energy Policy Project,\* under-written in part by the U.S. Department of Energy, looked at industries which are or could be associated with Wind Turbine components. Based on existing establishments which could make wind turbine components, Connecticut ranks among the top states for new job and investment potential. From a *purely manufacturing* perspective, an analysis of industries in the Green Bridgeport Region with the capacity to manufacture parts which *could* be associated with wind turbine components shows an overall decline, according to the Industry Breakdown chart below. There is a lack of entities that perform five of the ten types of manufacturing associated with wind turbine components in the Greater Bridgeport region. At the current levels of existence, the number of jobs in the occupations which comprise this sector of the manufacturing industry in the Green Bridgeport region will decline by 178 jobs by 2018 without significant investment.

Analysis of Wind Turbine Component Manufacturing-Type Industries

**Industry Breakdown**



NAICS Code	Description	2008 Jobs	2018 Jobs	EPW
326199	All other plastics product manufacturing	234	89	\$43,846
332991	Ball and roller bearing manufacturing	215	282	\$89,000
335312	Motor and generator manufacturing	80	11	\$23,948
332312	Fabricated structural metal manufacturing	44	14	\$57,624
334519	Other measuring and controlling device mfg.	26	27	\$72,129
335999	Miscellaneous electrical equipment mfg.	0	0	\$0
334418	Printed circuit assembly manufacturing	0	0	\$0
333611	Turbine and turbine generator set units mfg.	0	0	\$0
331511	Iron foundries	0	0	\$0
333412	Industrial and commercial fan and blower mfg.	0	0	\$0
333612	Speed changer, drive, and gear manufacturing	0	0	\$0
333613	Mechanical power transmission equipment mfg.	0	0	\$0
	<b>Total</b>	<b>600</b>	<b>422</b>	<b>\$58,032</b>

Source: EMSI Complete Employment - Fall 2008

According to the Center for American Progress, public investment in renewable energy sectors, including Wind Power, will help to create the early infrastructure that will generate higher levels of private sector confidence in further investment.

**Solar Power:** The occupational break down shows jobs that are found in industries which perform work in the renewable energy field of Solar Power, including Photovoltaics and solar-thermal electric sectors. Photovoltaic (PV) is the technical word for solar panels that create electricity, which can be used to run individual items ranging from as small as calculators to as large as highway signs, as well as supplementary power generators for utility customers already served by the electric grid. Solar thermal electricity technologies produce electric power by capturing and then channeling the sun’s heat to power plants used to make electricity through traditional heat-conversion technologies.\*

The analysis of occupations within Solar Power-related industries shows an increase in the Green Bridgeport Region of **359** jobs by 2018, from 3,333 in 2008 to 3,691 jobs across 15 top occupations. Of those, **976** are projected to be new or replacement jobs in that timeframe.

SOC Code	Solar Power	2008 Jobs	2018 Jobs	Change	% Change	New & Rep. Jobs
11-9021	Construction managers	681	839	158	23%	265
17-2071	Electrical engineers	95	92	(3)	(3%)	20
17-3023	Electrical and electronic engineering technicians	85	80	(5)	(6%)	13
47-2061	Construction laborers	949	1,113	164	17%	236
47-2073	Operating engineers and other construction equipment operators	297	324	27	9%	85
47-2111	Electricians	449	508	59	13%	179
47-3013	Helpers, electricians	31	34	3	10%	11
47-3019	Helpers, construction trades, all other	12	13	1	8%	4
49-2094	Electrical and electronics repairers, commercial and industrial equipm	50	53	3	6%	20
49-9098	Helpers--Installation, maintenance, and repair workers	99	109	10	10%	33
49-9099	Installation, maintenance, and repair workers, all other	130	138	8	6%	16
51-2022	Electrical and electronic equipment assemblers	198	142	(56)	(28%)	42
51-2023	Electromechanical equipment assemblers	94	77	(17)	(18%)	9
51-2041	Structural metal fabricators and fitters	53	50	(3)	(6%)	7
51-4121	Welders, cutters, solderers, and brazers	110	120	10	9%	34
		<b>3,333</b>	<b>3,691</b>	<b>359</b>	<b>11%</b>	<b>976</b>

Source: EMSI Complete Employment - Fall 2008

Solar power works in Connecticut, and likely represents the greatest potential for Connecticut to capitalize on in-state renewable resources, according to the report “Sustainable Solar Energy for Connecticut,” prepared for the Long-Term Sustainable Solar Energy Strategy Workgroup, and affiliated with the CT Clean Energy Fund. To date, about 8.6 MW of solar have been installed in Connecticut, and other projects have been approved but not yet completed. Many existing incentive programs for the

development of Solar Power installations have been cut, which threaten the viability of many of the 60 in-state PV installation firms. In November 2008, Connecticut Innovations, the state's quasi-public authority responsible for technology investing and innovation development, announced that it will administer a new \$9 million "Connecticut Clean Tech Fund" which will make investments in seed- and early-stage companies focused on innovations that conserve energy and resources, protect the environment or eliminate harmful waste. The goal of the Clean Tech Fund is to position Connecticut as the preferred location to grow clean technology jobs. The state also sponsored forums in early April on Economic Stimulus opportunities related to advanced technology and clean energy.

**Advanced Bio-Fuels:** The occupational break down shows jobs that are found in industries which perform work in the renewable energy field of Advanced Bio-Fuels, which at its core is the development of combustible fuels derived from biological, renewable sources. The industry includes bio-based product manufacturing including the development of new feedstocks (food-based including corn and soy, and non-food-based including agricultural waste, wood and algae products), transportation and delivery of products, alternative fuel distribution networks and vehicles.

The analysis of occupations within Advanced Bio-Fuels related industries shows a decrease in the Green Bridgeport Region of **14** jobs by 2018, from 541 in 2008 to 527 jobs across 11 top occupations. However, it is still projected that there will be a need to fill **134** new or replacement jobs in that time frame.

SOC Code	Advanced Bio-Fuels	2008 Jobs	2018 Jobs	Change	% Change	New & Rep. Jobs
11-9011	Farm, ranch, and other agricultural managers	<10	<10	--	--	--
13-1021	Purchasing agents and buyers, farm products	<10	<10	--	--	--
17-2041	Chemical engineers	20	22	2	10%	7
19-2031	Chemists	104	103	(1)	(1%)	26
19-4031	Chemical technicians	56	58	2	4%	21
45-1099	Supervisors, farming, fishing, and forestry workers	<10	<10	--	--	--
45-2011	Agricultural inspectors	<10	<10	--	--	--
45-2099	Agricultural workers, all other	<10	<10	--	--	--
51-9011	Chemical equipment operators and tenders	67	71	4	6%	22
51-9023	Mixing and blending machine setters, operators, and tenders	59	58	(1)	(2%)	12
53-7051	Industrial truck and tractor operators	213	193	(20)	(9%)	41
		<b>541</b>	<b>527</b>	<b>-14</b>	<b>-3%</b>	<b>134</b>

Source: EMSI Complete Employment - Fall 2008

Advanced Bio-Fuel industry activity is generally limited geographically to where source materials can be easily accessed. Some small-scale projects, including Trash-to-Energy plants which burn source materials for direct energy, are examples but are not considered in the Advanced category.

**Clean Water:** The occupational break down shows jobs that are found in industries which perform work under the general category of Clean Water, which includes water, sewage and other systems operation. Water treatment plans treat water so that is safe to drink while wastewater treatment plans remove harmful pollutants from domestic and industrial wastewater so that is safe to return to the environment. Operators read, interpret, and adjust meters and gauges to make sure plant equipment and processes are working properly. They operate chemical-feeding devices, take samples of the water or wastewater, perform chemical and biological laboratory analyses, and adjust the amount of chemicals, such as chlorine, in the water. They use a variety of instruments to sample and measure water quality, and common hand and power tools to make repairs. Operators also make minor repairs to valves, pumps, and other equipment.

(Occupational Profiles, U.S. Dept. of Veterans' Affairs)

The analysis of occupations within Clean Water-related industries shows an increase in the Green Bridgeport Region of **396** jobs by 2018, from 5,199 in 2008 to 5,595 jobs in 2018 across 13 top occupations. Of those, **1,429** are projected to be new or replacement

jobs in that timeframe. There is anecdotal evidence that there will soon be turnover in these jobs due to a wave of retirements in the regional waste-water treatment plants.

SOC Code	Clean Water	2008 Jobs	2018 Jobs	Change	% Change	New & Rep. Jobs
11-1021	General and operations managers	1,565	1,502	(63)	(4%)	321
11-3051	Industrial production managers	150	142	(8)	(5%)	54
15-1071	Network and computer systems administrators	238	267	29	12%	83
17-3022	Civil engineering technicians	25	24	(1)	(4%)	4
43-5041	Meter readers, utilities	17	15	(2)	(12%)	5
47-1011	First-line supervisors/managers of construction trades and extraction	783	933	150	19%	261
47-2061	Construction laborers	949	1,113	164	17%	236
47-2111	Electricians	449	508	59	13%	179
47-2151	Pipelayers	89	109	20	22%	39
47-2152	Plumbers, pipefitters, and steamfitters	379	437	58	15%	139
49-9012	Control and valve installers and repairers, except mechanical door	64	68	4	6%	16
51-8031	Water and liquid waste treatment plant and system operators	126	140	14	11%	36
51-9061	Inspectors, testers, sorters, samplers, and weighers	365	338	(27)	(7%)	56
		<b>5,199</b>	<b>5,595</b>	<b>396</b>	<b>8%</b>	<b>1,429</b>

Source: EMSI Complete Employment - Fall 2008

There is significant investment in the ARRA earmarked toward water and related resources infrastructure, efficiency and water quality improvements, including the Clean Water and Safe Drinking Water State Revolving Funds, of which Connecticut is expected to receive formula funding of \$48.8 million. The projects funded by this program will be decided by the state’s Recovery Working Group. The revolving fund will provide loans for water quality protection projects, including wastewater treatment, nonpoint source pollution control, watershed and estuary management, and drinking-water-system infrastructure improvements. It is not yet know what program in the Green Bridgeport region may be on the Working Group’s list of priorities.

**Automotive Technology:** The occupational break down shows jobs that are found in industries which perform work in the field of Automotive Technology. Servicing today’s vehicles is much different than it was a few years ago. Demands on the automotive industry to build more reliable, cleaner, safer and more fuel-efficient vehicles has greatly changed the way products are built, operated and serviced. Today’s automotive technicians must keep up with these changes. Those who have the proper education and training will find excellent career opportunities as skilled and certified technicians.

The analysis of occupations within Automotive Technology-related industries shows an increase in the Green Bridgeport Region of **204** jobs by 2018, from 1,384 in 2008 to 1,587 jobs across seven (7) top occupations. It is projected that there will be a need to fill **495** new or replacement jobs in that time frame.

SOC Code	Automotive Technology	2008 Jobs	2018 Jobs	Change	% Change	New & Rep. Jobs
41-2022	Parts salespersons	106	102	(4)	(4%)	10
49-1011	First-line supervisors/managers of mechanics, installers, and repairer	301	322	21	7%	93
49-3021	Automotive body and related repairers	176	197	21	12%	63
49-3023	Automotive service technicians and mechanics	596	736	140	23%	260
49-3031	Bus and truck mechanics and diesel engine specialists	178	197	19	11%	58
49-3052	Motorcycle mechanics	24	30	6	25%	11
49-3092	Recreational vehicle service technicians	<10	<10	--	--	--
		<b>1,384</b>	<b>1,587</b>	<b>204</b>	<b>15%</b>	<b>495</b>

Source: EMSI Complete Employment - Fall 2008

In addition to the broad Green fields advocated by The Green Recovery and other national reports, Automotive Technology has been designated as a growing field in Connecticut, training and education for which will receive support through the Connecticut Community Colleges’ Sustainable Operations: Alternative and Renewable (SOAR) Energy Initiative. SOAR recently received a \$2 million grant from the Education & Training Administration of the U.S. Department of Labor.

**Environmental Technology:** Many of the occupations included in this field are concerned with the task of remediating Brownfield sites. The U.S. Environmental Protection Agency defined Brownfield sites as abandoned, idle or underused industrial and commercial facilities. Expansion or redevelopment is complicated by real or perceived environmental contamination. Workers in this industry go about “greening” these sites to make them environmentally-friendly as well as recycle them back into use. The field is not limited to Brownfield remediation. Workers in this industry help ensure the quality the built and natural environment; safe disposal of waste from sites in use; pollution prevention; and policy-makers who advocate for better, cleaner and greener goods, services, structures and methodologies.

The analysis of occupations within Environmental Technology-related industries shows an in the Green Bridgeport Region of **342** jobs by 2018, from 5,476 in 2008 to 5,818 jobs across 25 top occupations. It is projected that there will be a need to fill **1,457** new or replacement jobs in that time frame.

SOC Code	Environmental Technology/Brownfields	2008 Jobs	2018 Jobs	Change	% Change	New & Rep. Jobs
13-1041	Compliance officers, except agriculture, construction, health and safe	159	162	3	2%	21
17-1021	Cartographers and photogrammetrists	12	13	1	8%	5
17-1022	Surveyors	33	34	1	3%	11
17-2031	Biomedical engineers	14	16	2	14%	5
17-2081	Environmental engineers	23	26	3	13%	10
17-2131	Materials engineers	19	18	(1)	(5%)	4
17-2141	Mechanical engineers	220	212	(8)	(4%)	41
17-3025	Environmental engineering technicians	<10	<10	--	--	--
17-3029	Engineering technicians, except drafters, all other	23	23	0	0%	5
17-3031	Surveying and mapping technicians	29	29	0	0%	6
19-1021	Biochemists and biophysicists	81	89	8	10%	24
19-2042	Geoscientists, except hydrologists and geographers	<10	<10	--	--	--
19-4091	Environmental science and protection technicians, including health	16	18	2	13%	8
29-9011	Occupational health and safety specialists	27	28	1	4%	6
47-1011	First-line supervisors/managers of construction trades and extraction'	783	933	150	19%	261
47-2061	Construction laborers	949	1,113	164	17%	236
47-3019	Helpers, construction trades, all other	12	13	1	8%	4
47-4011	Construction and building inspectors	76	82	6	8%	20
47-4041	Hazardous materials removal workers	28	29	1	4%	7
51-8031	Water and liquid waste treatment plant and system operators	126	140	14	11%	36
51-9061	Inspectors, testers, sorters, samplers, and weighers	365	338	(27)	(7%)	56
53-3032	Truck drivers, heavy and tractor-trailer	884	914	30	3%	189
53-7051	Industrial truck and tractor operators	213	193	(20)	(9%)	41
53-7062	Laborers and freight, stock, and material movers, hand	1,210	1,197	(13)	(1%)	391
53-7081	Refuse and recyclable material collectors	156	180	24	15%	65
		<b>5,476</b>	<b>5,818</b>	<b>342</b>	<b>6%</b>	<b>1,457</b>

Source: EMSI Complete Employment - Fall 2008

The ARRA seeks in part to spur technological advances in science and health and to invest in environmental protection and other infrastructure that will provide long-term economic benefits. Among its many funding programs is an expanded Brownfields Job Training Grant program, which seeks to facilitate job creation by providing for the training of individuals in the assessment, remediation and preparation of Brownfields sites. However, there is a cross-over among Environmental Technology occupations with those identified here in the Clean Water, Building Retrofitting & Weatherization, Solar and Wind power industries.

**Farming, Fishing & Landscaping:** Any look at Green industries would be incomplete without inclusion of the occupations considered closest to the land: Farming, Fishing & Landscaping. In many ways, these jobs depend on the Greening of other industries, as they are affected by the quality of air, land and water which feeds them. They also have ties to the Tourism industry, which is an economic driver in Connecticut.

Farming, Fishing & Landscaping industries in Connecticut are made up of producers of dairy products, eggs, mushrooms, fruits and vegetables, tobacco, wine and forestry products, and also includes aquaculture, nurseries, greenhouses and florists.

The analysis of occupations within related industries shows an increase in the Green Bridgeport Region of **30** jobs by 2018, from 523 in 2008 to 553 jobs across 21 top occupations. It is projected that there will be a need to fill **117** new or replacement jobs in that time frame.

SOC Code	Farming, Fishing & Landscaping	2008 Jobs	2018 Jobs	Change	% Change	New & Rep. Jobs
11-3061	Purchasing managers	64	62	(2)	(3%)	17
11-9011	Farm, ranch, and other agricultural managers	<10	<10	--	--	--
11-9012	Farmers and ranchers	<10	<10	--	--	--
13-1021	Purchasing agents and buyers, farm products	<10	<10	--	--	--
17-2021	Agricultural engineers	<10	<10	--	--	--
19-1031	Conservation scientists	<10	<10	--	--	--
25-9021	Farm and home management advisors	49	52	3	6%	10
33-3031	Fish and game wardens	<10	<10	--	--	--
37-1012	First-line supervisors/managers of landscaping, lawn service, and gro	128	147	19	15%	28
39-6021	Tour guides and escorts	19	23	4	21%	12
39-6022	Travel guides	<10	<10	--	--	--
45-1099	Supervisors, farming, fishing, and forestry workers	<10	<10	--	--	--
45-2011	Agricultural inspectors	<10	<10	--	--	--
45-2091	Agricultural equipment operators	<10	<10	--	--	--
45-2092	Farmworkers and laborers, crop, nursery, and greenhouse	40	42	2	5%	14
45-2093	Farmworkers, farm and ranch animals	10	14	--	--	--
45-3011	Fishers and related fishing workers	<10	<10	--	--	--
49-3041	Farm equipment mechanics	<10	<10	--	--	--
49-9099	Installation, maintenance, and repair workers, all other	130	138	8	6%	16
51-3022	Meat, poultry, and fish cutters and trimmers	11	12	1	9%	5
53-5021	Captains, mates, and pilots of water vessels	22	<10	--	--	--
		<b>523</b>	<b>553</b>	<b>30</b>	<b>6%</b>	<b>117</b>

Source: EMSI Complete Employment - Fall 2008

Of interest is that there are cross-over occupations from Farming, Fishing & Landscaping with the emerging Green industry of Advanced Bio-Fuels, as will be detailed later.

**Fuel Cell Technology:** Connecticut is known as the birthplace of modern fuel cells, yet this industry has not taken hold in the Green Bridgeport region. In 1999, the Connecticut Clean Energy fund was created to grow renewable energy in Connecticut. It soon made fuel cell development and commercialization a major focus through the Fuel Cell Initiative which included investments in technology, demonstration sites, deployment and establishment of a fuel cell educational center. Today, Connecticut is home to the two major fuel cell manufacturing companies in the country: FuelCell Energy, Inc. based in Danbury with a second location in Torrington, and United Technologies Corp.’s UTC Power in South Windsor. ([www.ctcleanenergy.org](http://www.ctcleanenergy.org))

In principal, fuel cell operates like a large battery, processing hydrogen and oxygen over electrodes, generating electricity with no emissions. It is in the manufacturing and commercialization of fuel cells that most job opportunities lie. Of the industries associated with Fuel Cell manufacturing, only electronic capacitor manufacturing (NAICS #: 334414) has a presence in the Green Bridgeport region, with a total of 126 jobs in 2008 but a projected drop to 52 jobs by 2018. A chart of the top occupation in electronic capacitor manufacturing follows:

SOC Code	Electronic Capacitor Mfg (Fuel Cell):Top Occupations	2008 Jobs	2018 Jobs	Change	% Change
51-2022	Electrical and electronic equipment assemblers	22	8	(14)	(63%)
51-2023	Electromechanical equipment assemblers	6	2	(4)	(71%)
51-9061	Inspectors, testers, sorters, samplers, and weighers	5	2	(3)	(56%)
17-3023	Electrical and electronic engineering technicians	5	2	(3)	(58%)
17-2112	Industrial engineers	5	2	(3)	(66%)
17-2071	Electrical engineers	4	2	(2)	(47%)
17-2072	Electronics engineers, except computer	4	2	(2)	(48%)

Source: EMSI Complete Employment - Fall 2008

## REGIONAL OCCUPATIONAL ANALYSIS

What follows is an analysis of the SOC (Standard Occupational Classification) codes which appeared through the industry analysis and occupations identified in the preceding reports.

This analysis shows which occupations most frequently occur. By identifying those occupations, it is possible to help determine what kind of training and education programs should be supported and developed in order to give workers the best chance of finding work in one or more of the

The following chart describes the types of occupations within these industries which appear the most frequently. **Construction and extraction occupations have the most frequency; followed by architecture & engineering; production; and installation, repair and maintenance occupations.**

SOC Prefix	Occupational Description	# of Different Occupations	Occupations by Full SOC code	Industries Found In
11	Management	6	11-1021; 11-3051; 11-3061; 11-9011; 11-9012; 11-9021	Building Retrofitting & Weatherization; Smart Grid; Wind Power; Solar Power; Adv. Bio-Fuels; Clean Water; Farm, Fishing & Landscaping
13	Business & Financial	2	13-1021; 13-1041	Adv. Bio-Fuels; Environmental Tech; Farming, Fishing & Landscaping
15	Computer & Mathematical Science	3	15-1031; 15-1033; 15-1071	Smart Grid; Clean Water
17	Architectural & Engineering	18	17-1021; 17-1022; 17-2021; 17-2031; 17-2041; 17-2051; 17-2071; 17-2072; 17-2081; 17-2112; 17-2131; 17-2141; 17-3022; 17-3023; 17-3024; 17-3025; 17-3029; 17-3031	Mass Transit/Freight Rail; Smart Grid; Wind Power; Solar Power; Adv. Bio-Fuels; Clean Water; Environ. Tech; Farm, Fish & Landscaping; Fuel Cell
19	Life, Physical & Social Science	6	19-1021; 19-1031; 19-2042; 19-4031; 19-4091; 19-2031	Adv. Bio-Fuels; Environ. Tech; Farming, Fishing & Landscaping
25	Education, Training	1	25-9021	Farming, Fishing &

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	& Library			Landscaping
29	Healthcare Practitioners & Technicians	1	29-9011	Environmental Technology
33	Protective Service	1	33-3031	Farming, Fishing & Landscaping
37	Building & Grounds/ Cleaning & Maintenance	1	37-1012	Farming, Fishing & Landscaping
39	Personal Care & Service	2	39-6021; 39-6022	Farming & Fishing
41	Sales & Related	1	41-2022	Automotive Technology
43	Office & Administrative Support	2	43-5032; 43-5041	Mass Transit/Freight Rail; Clean Water
45	Farming, Fishing & Forestry	6	45-1099; 45-2011; 45-2091; 45-2092; 45-2093; 45-2099; 45-3011	Adv. Bio-Fuels; Farming, Fishing & Landscaping
47	Construction & Extraction	27	47-1011; 47-2021; 47-2031; 47-2041; 47-2051; 47-2053; 47-2061; 47-2073; 47-2081; 47-2082; 47-2111; 47-2121; 47-2131; 47-2151; 47-2152; 47-2161; 47-2181; 47-2211; 47-2221; 47-3012; 47-3013; 47-3019; 47-4011; 47-4021; 47-4041; 47-4061; 47-4091	Building Retrofitting & Weatherization; Mass Transit/Freight Rail; Smart Grid; Wind Power; Solar Power; Clean Water; Environ. Tech
49	Installation , Maintenance & Repair	14	49-1011; 49-2094; 49-3021; 49-3023; 49-3031; 49-3041; 49-3052; 49-3092; 49-9012; 49-9021; 49-9044; 49-9051; 49-9098; 49-9099	Building Retrofitting & Weatherization; Smart Grid; Wind Power; Solar Power; Clean Water; Automotive Tech; Farming, Fishing & Landscaping
51	Production Occupations	16	16-1011; 16-2022; 16-2023; 16-2031; 16-2041; 16-2092;	Mass Transit/Freight Rail; Smart Grid; Wind Power; Solar Power;

			16-3022; 16-4021; 16-4035; 16-4041; 16-4072; 16-4121; 16-8031; 16-9011; 16-9023; 16-9061	Adv. BioFuels; Wind Turbine Component Mfg; Clean Water; Environ. Tech; Farming, Fishing & Landscaping; Fuel Cell
53	Transportation & Material Moving	9	53-3021; 53-3032; 53-4019; 53-4031; 53-5021; 53-7021; 53-7051; 53-7062; 53-7081	Building Retrofitting & Weatherization; Mass Transit/Freight Rail; Wind Power; Adv. Bio- Fuels; Environ. Tech; Farming, Fishing & Landscaping

**LIST OF TOP “GREEN” OCCUPATIONS BASED ON INDUSTRIES (DESCENDING)**

1. Construction Laborers
2. Construction managers; Operating engineers and other construction equipment operators; Electrical and electronic equipment assemblers; Industrial truck and tractor operators
3. Electricians; Inspectors, testers sorters samplers and weighers
4. Electrical engineers; Civil engineering technicians; electrical and electronic engineering technicians; Structural iron and steel workers; electromechanical equipment assemblers; Machinists; Crane and tower operators
5. Farm, ranch or other agricultural managers; Purchasing agents and buyers, farm products; Environmental engineers; Environmental engineering technicians; Supervisors: farming, fishing and forestry workers; Agricultural inspectors; first-line supervisors/managers of construction trades and extraction; Carpenters; Construction helpers; Construction and building inspectors; Electrical and electronics repairers, commercial and industrial equipment; Installation, maintenance and repairs workers; First-line supervisors/mangers of production and operating workers; Structural metal fabricators and fitters.

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The chart below takes the occupations listed above and shows, in descending order, the occupations most occurring with average hourly earnings (2007); the education level necessary for each; and which industries employ them.

SOC Code	Occupations Most Occurring	2007 Avg Hourly Earnings	Education Level	Industries Found In
47-2061	Construction laborers	\$27.68	Moderate-term on-the-job training	BR & W; MT/FR; SG; SP; CW; ET
11-9021	Construction managers	\$39.38	Bachelor's degree	BR & W; MT/FR; SG; WP; SP
47-2073	Operating engineers and other construction equipment operators	\$29.52	Moderate-term on-the-job training	BR & W; MT/FR; SG; WP; SP
51-2022	Electrical and electronic equipment assemblers	\$19.15	Short-term on-the-job training	SG; WP; SP; WTC; FC
53-7051	Industrial truck and tractor operators	\$21.98	Short-term on-the-job training	BR & W; MT/FR; WP; AB; ET
47-2111	Electricians	\$28.25	Long-term on-the-job training	
51-9061	Inspectors, testers, sorters, samplers, and weighers	\$24.07	Moderate-term on-the-job training	
17-2071	Electrical engineers	\$50.49	Bachelor's degree	FC; SP; SG
17-3022	Civil engineering technicians	\$30.99	Associate's degree	SG; MT/FR; CW
17-3023	Electrical and electronic engineering technicians	\$32.50	Associate's degree	SG; FC; SP
47-2221	Structural iron and steel workers	\$31.51	Long-term on-the-job training	BR; MT/FR; WP
51-2023	Electromechanical equipment assemblers	\$20.14	Short-term on-the-job training	WP; SP; FC
51-4041	Machinists	\$23.23	Long-term on-the-job training	WP; WTC; SG
53-7021	Crane and tower operators	\$36.39	Long-term on-the-job training	WP; BR & W; MT/FR
11-9011	Farm, ranch, and other agricultural managers	\$-	Degree plus work experience	AB; FF & L
13-1021	Purchasing agents and buyers, farm products	\$-	Work experience in a related field	AB; FF & L
17-2081	Environmental engineers	\$52.24	Bachelor's degree	WP; ET
17-3025	Environmental engineering technicians	\$-	Associate's degree	WP; ET
45-1099	Supervisors, farming, fishing, and forestry workers	\$-	Work experience in a related field	AB; FF & L
45-2011	Agricultural inspectors	\$-	Work experience in a related field	AB; FF & L
47-1011	First-line supervisors/managers of construction trades and extraction workers	\$35.94	Work experience in a related field	CW; ET

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SOC Code	Occupations Most Occurring	2007 Avg Hourly Earnings	Education Level	Industries Found In
47-2031	Carpenters	\$31.98	Long-term on-the-job training	BR & W; MT/FR
47-3013	Helpers, electricians	\$15.20	Short-term on-the-job training	SP; BR & W
47-3019	Helpers, construction trades, all other	\$17.79	Short-term on-the-job training	SP; ET
47-4011	Construction and building inspectors	\$33.73	Work experience in a related field	BR& W; ET
49-2094	Electrical and electronics repairers, commercial and industrial equipment	\$32.52	Postsecondary vocational award	WP; SP
49-9099	Installation, maintenance, and repair workers, all other	\$21.13	Moderate-term on-the-job training	SP; FF & L
51-1011	First-line supervisors/managers of production and operating workers	\$40.82	Work experience in a related field	WP; WTC
51-2041	Structural metal fabricators and fitters	\$19.94	Moderate-term on-the-job training	MT/FR; SP
51-2092	Team assemblers	\$18.56	Moderate-term on-the-job training	SG; WTC
51-4041	Machinists	\$23.23	Long-term on-the-job training	MT/FR; SP
51-8031	Water and liquid waste treatment plant and system operators	\$27.40	Long-term on-the-job training	CW; ET

**KEY:**

BR & W: Building Retrofitting
SG: Smart Electrical Grid/Transmission Systems
SP: Solar Power
WP: Wind Power
CW: Clean Water
AT: Automotive Technology
FF & L: Farming, Fishing & Landscaping
FC: Fuel Cell
WTC: Wind Turbine Component Mfg.
MT/FR: Mass Transit/Freight Rail
ET: Environmental Technology

The chart shows frequent cross over of occupations between the different Green industries included in this report. **The most common cross-over occurred between Building Retrofitting & Weatherization with Mass Transit/Freight Rail; Advanced BioFuels and Farming, Fishing & Landscaping; and Environmental Technology with Clean Water, Solar Power and Wind Power industries.**

## RECOMMENDATIONS

As this report shows, there is no ONE official definition or classification of Green Jobs. Industries are emerging, but the occupations that will make them work remain the same.

The best strategies will involve coordinated investments in education and training involving the K-12, technical high schools, community colleges, and four-year universities for occupations identified in this report.

I. **Support regionally-focused training programs in industries with the most frequent occurrence in Green Industries, including:**

Construction and extraction occupations have the most frequency; followed by architecture & engineering; production; and installation, repair and maintenance occupations, with a special focus on electrical.

Consider the projected new or replacement jobs in each industry in the Green Bridgeport region through 2018. Skills for jobs in trouble due to the economic downturn are largely transferable into Green Industries.

This will include developing strategies to bid competitively as a state, region or individual municipalities, and in collaboration with non-profits and training providers, for funds from the U.S. Department of Labor under the Green Jobs: Energy Efficiency and Renewable Energy Worker Training program. This \$500 million opportunity can be used for research, labor exchange and job training projects that prepare workers in the energy efficiency and renewable energy fields described in this report.

By taking guidance from the precursor to this program, the Green Jobs Act of 2007, particular emphasis should be put on partnerships between industry, labor and community entities for training and education program development.

II. **Support Small and Minority Business Resource Offices:** Training and education programs specific to helping women and minority-owned businesses and workers to bid on and find work, particularly in the construction trades. Enables

- III. the city to pursue funding streams related earmarked for these populations, including the Federal Highway Administration's Transportation Enhancement Activities program using Highway Investment Funds (included or enhanced by the ARRA ([www.recovery.gov/DOT](http://www.recovery.gov/DOT)))
- IV. **Pursue Energy Efficiency & Conservation Block Grants**: In a system modeled after the Community Development Block Grant (CDBG) program, the Energy Efficiency Block grants are available to state and local governments to for local-level projects related to Energy Efficiency and Renewable Energy, which will create projects that create green jobs.
- V. **Expansion and development of program which provide the skills and knowledge needed to satisfy the North American Board of Certified Energy Professionals (NABCEP) requirements for entry-level work**. For example, expansion of non-credit/certificate programs at Housatonic and Norwalk Community College for solar PV, modeled after the program offered through the Center for a Sustainable Future at Gateway Community College
- VI. **Community Organizer Approach**: The approach to making Bridgeport the "Greenest City" cannot be done without getting into the roots of the community. This will entail public advocacy and public outreach to a variety of demographic groups. If residents feel engaged in the conversation, they will feel part of the movement.\* Additionally, plans which engage non-profits, labor, government and business groups and which distribute funds equitably within and among communities are most likely to succeed.
- VII. **Pathways out of Poverty**: A community organization approach will mirror the benefits of the Pathways out of Poverty approach that was a main tenet of the Green Jobs Act of 2007 and expected to be reflected in the Green Jobs ARRA funding that is to be allocated through the U.S. Department of Labor. The provision of support services will be critical to proliferating and sustaining Green

industries and Green jobs, as well as creating a employment-pipeline for jobs as they are developed, see [www.ellabakercenter.org](http://www.ellabakercenter.org).

- VIII. **Connection to Building Trades Unions:** Labor Halls often have the latest equipment and highest quality trainers and facilities. The unions also have established ties to the business community and can assist with connecting those trained with jobs. They will also be the key component to establishing pre-apprenticeship, apprenticeship and on-going career ladders. This is a sustainable approach that is enhanced by the ability to return to the Labor Hall on an ongoing basis to get new skills. Carpenters Union Local 210 has already been an active partner in the Bridgeport Jobs Funnel program. Labor unions on a national level have embraced the Green jobs movement, see [www.bluegreenalliance.org](http://www.bluegreenalliance.org).
- IX. **Support the Green Jobs Exposition:** In the Planning Stages for October 2009. Includes a jobs expo at a downtown location; musical performances; lectures; local contractor showcase; and a keynote speaker to meet with local decision-makers and serve as a community-wide event centerpiece.

### **GO BEYOND THE NEXT TWO YEARS OF ARRA FUNDING**

- ✓ **Establish an Apollo Alliance Local Chapter:** The Apollo Alliance is a coalition of labor, business, environmental, and community leaders working to catalyze a clean energy revolution that will put millions of Americans to work in a new generation of high-quality, green-collar jobs. There are chapters throughout the United States. See [www.apolloalliance.org](http://www.apolloalliance.org)
- ✓ **Maintain a Local Office which monitors local prevailing wage/local hire standards:** Better standards translate into better working condition and in many cases, greener, safer worksites. Enhances local residents' ability to enter jobs and maintain a family-supporting wage. Monitoring by local planning bodies and

oversight bodies will ensure that residents within the communities where projects are undertaken will reap the benefits. See, [www.communitybenefits.org](http://www.communitybenefits.org), the website for the Partnership for Working Families.

## **STUDY METHODOLOGY**

The occupational charts included in this report were generated using a data analysis system from EMSI.

The team of data experts at EMSI developed subsets of industries based on Green Economic Investment categories published in the report “Green Recovery: A Program to Create Good Jobs and Start Building a Low-Carbon Economy, by the Center for American Progress and the Political Economy Research Institute at the University of Massachusetts, Amherst. The WorkPlace, Inc. used this Green Jobs data tool to evaluate the geographic area identified for this report.

SOC (Standard Occupational Coding) and NAICS (North American Industry Classification System) codes generated within the EMSI subsets were then analyzed for frequency and cross-over occurrences.

Occupational and industry forecasting is done based on projections and models using the latest data available, in the case of this report Fall 2008. The full impact of the economic downturn as well as the ARRA stimulus funds have not yet been quantified.

In addition, several sources were consulted for industry background, definitions and ARRA funding updates and opportunities. Those sources are included in the endnotes to follow.

## **ACKNOWLEDGEMENTS**

Many thanks to the many individuals that have made this report possible. Most importantly, thanks to Mayor Bill Finch for his vision for the City to be the Greenest city in Connecticut; Rina Bakalar for her commitment and passion to Green; Adrienne Houel for her patience and leadership; Special thanks to Alanna Kabel with the City of Bridgeport and The United Illuminating Company (UI) for their financial assistance.

## **ABOUT THE BLUEGREEN RESEARCH INSTITUTE**

The Blue Green Research Institute is a project of The WorkPlace, Inc., based in Connecticut, provides capacity services aimed at building the financial, programmatic and organizational capacity of not-for-profit organizations, governmental agencies and for-profit. The BlueGreen Research Institute is a boutique service provider assisting workforce, economic and community development entities to understand complex issues related to policy, strategy, and human capital planning. Our goal is to help clients understand and use data to make practical and professional decisions related to their industries, while providing access to “Blue Oceans” of opportunities in growing Green and mature industries. Based on an innovative business model, the Institute is able to effectively rendered high-quality services to organizations at reasonable costs. Clients range from small, local faith-based and grassroots organizations to larger, national organizations. The Institute works throughout the United States and to date has worked with over 150 organizations and has secured over \$20 million on behalf of clients in competitive funding.

## **ABOUT THE AUTHORS**

**Michael McCarthy**, MS, is the Assistant Vice President for New Business Development for The WorkPlace, Inc. (Southwestern Connecticut’s Regional Workforce Development Board) located in Bridgeport, Connecticut. In this position, Michael is responsible for several key initiatives aimed at improving the capacity and competitiveness of industries as they relate to workforce and economic development and is currently the Director of the BlueGreen Research Institute.

Michael has begun working with a number of communities around examining Green workforce issues. Most recently, Michael developed a plan for a multi-county collaboration in the Hudson Valley (New York) around “Green collar” workforce talent development. This project resulted in an initial investment of \$500,000 from the New York State Department of Labor to examine the role of Green jobs in the economy. This collaboration brought together WIBs, community colleges, economic development entities and Green businesses to the collaborative table to develop a transformative strategy in workforce development.

Prior to joining The WorkPlace, Michael worked for the City of Bridgeport where he was involved in both economic and community development initiatives. Michael is a frequent presenter at conferences and seminars on economic and workforce development topics. Mr. McCarthy holds a Masters of Science in Urban Management from Southern Connecticut State University (SCSU) and a Bachelor of Arts in Political Science from Albertus Magnus College.

**Ann Harrison** is the Manager of Policy and Research at The WorkPlace, Inc. Ms. Harrison is a key point of contact for legislative and policy issues that impact the WorkPlace’s mission and programs. Ann’s responsibilities include investigating policy themes and analyzing research relating to workforce development; identifying opportunities for The WorkPlace, Inc. to advocate policy solutions to issues affecting businesses and workers; draft and edit materials for print and online to inform and advise policy makers, influencers and other audiences about matters relating to workforce development and to undertake research, policy development and the development of projects to enable The WorkPlace to achieve its strategic goals.

Ann holds a BS degree in Political Science and Journalism from Southern Connecticut State University. Prior to joining the WorkPlace, Ann was a newspaper reporter and worked in the private sector as a public relations account executive; for government (city and state) and for non-profit organizations in Connecticut.

LOGOs



City.....UI.....Green Team.....BlueGreen