

Pathways and Policies Towards Green Jobs in Cincinnati

October, 2010





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Executive Summary

This report identifies the policies and programs that could be put in place to support and expand the growth of “Green Jobs” within the manufacturing industries best suited for the greater Cincinnati region. The report has identified five key findings and five key recommendations for policy and program implementation – each discussed in detail throughout the report.

Key Findings of the report:

1. At the beginning of this process, there was not a clear definition of Green Jobs within the region.
2. Organizations and government efforts to promote green jobs in the region are not focused or coordinated.
3. Manufacturing in greater Cincinnati can continue to be a vital part of the Ohio economy.
4. The existing manufacturing skills in greater Cincinnati are vital for green growth industries.
5. Government policy, incentives, and training exist for green jobs, but they are not coordinated to work together with economic development strategies.

Project Background

In June of 2009, the Pew Charitable Trusts released *The Clean Energy Economy*, listing Ohio as having the 4th most “Clean Jobs” in the US. The study evaluated each State across five categories of the “Clean Energy Economy” including Clean Energy, Energy Efficiency, Environmentally Friendly Production, Conservation and Pollution Mitigation, and Training and Support jobs. Pew reports that, “Ohio ranked among the top five states with the most jobs in clean energy, energy efficiency, and environmentally friendly production in 2007,” and classifies Ohio as having a “Large and

Key Recommendations of the report:

1. Define Green Jobs as jobs which produce green products or services while paying full-time living wages (and prevailing wages in the construction sector) with affordable quality health care and retirement benefits for work completed in a safe working environment.
2. Create a local Green Jobs Council
3. Support existing companies in transition to Green Jobs
4. Develop a strong funding model to support additional investment
5. Add ‘Green Strings’ to existing government incentives
6. Add, align, and enhance existing policies for Green Jobs

Growing Clean Energy Economy”, meaning that the total number of green jobs in 2007 exceeded the national average and that these markets have grown by an average of 1% annually. Other states with similar economies included California, Florida, Georgia, Indiana, Massachusetts, Michigan, Minnesota, North Carolina, Texas, Virginia, and Washington.

Specifically within the Environmentally Friendly Production category, Ohio ranked 4th in the country with a total of 2,800 green manufacturing related jobs trailing Oregon and Minnesota by just over 1,000 jobs, but California was the run-away leader in this jobs race with 13,666 manufacturing related



green jobs. However, the Pew report analyzed only a “double bottom line of economic growth and environmental sustainability”, and makes no effort of identifying the social sustainability of the jobs in their report.

As Green Collar jobs advocate Van Jones states in his book, *The Green Collar Economy*,

“Opportunities abound to make things better for everyone.... The key to this is setting high standards and expectations for what a green-collar job even is. That starts by baking high quality and good values into the very definition of a green-collar job. My definition of a green-collar job is this: it is a *family-supporting, career-track job that directly contributes to preserving or enhancing environmental quality.*”

The shortcoming of the Pew report comes in their definition of a green job. There is no mention the social objectives of family-supporting, or career-track in the definitions of green jobs.

The definition of any green job must include the socially equitable standards of family-supporting and career-track. The ability of families to improve their circumstances over generations is the backbone of the middle and upper-middle class families in this country. According to US Census data, in 2008 nearly 25% of all 25-35 year olds had a college degree, but only 10% of their grandparents (those 75 years and older) did. This trend is the common story of middle-class families across the United States; grandparents who worked in a factory, or in other skilled trades, who were able to support their family over their career, who’s children were able to attain higher levels of education, earning family-supporting wages in career-track jobs, and so on.

At a time when low-educational attainment, high-skill jobs are decreasing, it is more important than ever to find ways to support these jobs. Green Collar Jobs provide the chance for communities to reinvigorate their skilled

workforce, support a middle-class, and provide opportunity for families to improve their circumstances from generation to generation.

This report is focused on finding the strategies that Cincinnati area government, non-profit, and other community organizations can employ to support Green Collar Jobs that are family-supporting and career-track. According to the Economic Modeling Specialist data available through the Ohio Skills Bank, manufacturing jobs in the U.S. are projected to increase approximately 3% from 2009-2016, but in Ohio, the manufacturing occupations are projected to lose close to 4%. The objective of this report is to provide tools and resources through case-study examples, policy proposals, and guidance for reversing that projection and retaining or attracting green manufacturing in the Cincinnati area.

Report Objectives

Through discussion and recommendation from the study’s Steering Committee, the objectives of this study included the following research goals related to manufacturing jobs:

1. Identification of existing green markets in the Cincinnati Region
2. Identification of potential green markets in the Cincinnati Region
3. Identification of barriers to green manufacturing jobs and green business expansion/relocation to the Cincinnati Region.
4. Identification of incentives and policies to attract and retain green manufacturing jobs and businesses in the Cincinnati Region.
5. Identification of incentives, policies, and resources available to transition existing businesses to green businesses

It was also important to make sure that the proposed incentives, policies, and strategies align with existing economic development frameworks such as Agenda 360, and the GO (Growth and Opportunity) Cincinnati Study, in addition to aligning with efforts by the City, County, and State economic development strategies where appropriate.



Report Methodology

Between July and October of 2009, emersion DESIGN led several steering committee and manufacturing task force meetings consisting of local leaders in educational and training institutions, representative labor unions, current and potential green employers, and government representatives to gather information about existing training, existing jobs, and existing policies related to green manufacturing in Cincinnati and Hamilton County. Throughout this time, emersion DESIGN and Davis Langdon conducted additional research through available workforce data, publicly available records of government investment and policies, and training programs to supplement and give context to the report.

Committee Structure

The Blue Green Alliance identified many key stakeholders to be involved with the steering committee for the project, and with their help, the task force was established to provide real-world feedback and input by companies and educators involved in green markets.

The steering committee met monthly to review research findings, and provide guidance for the research team about which factors would be most critical and important to make confident decisions about policy implementation. Proposed definitions of green jobs, green businesses, policy examples, funding mechanisms, and report findings and proposals were all reviewed by members of the steering committee.

The task force met three times to provide initial information, provide a database of existing green activity, and to provide real-world examples of policies that would help their business, or major roadblocks that prevent their business from expanding.

Definitions

Through discussion with the project's Steering Committee, the geographical boundaries of the study were coordinated with previous research of Agenda360 and Go Cincinnati including the 4 Ohio counties of Hamilton, Butler, Clermont, and Warren, and the 7 bordering counties in Indiana and Kentucky. Clearly, policy, incentive, and program recommendations that are local in nature might differ from county to county and city to city. Some of the proposals in this report are targeted specifically at the city of Cincinnati and Hamilton County, while others require broader support of adjacent counties, or even the state. Policies that are city or county specific are proposed with the understanding that effective policy models can be emulated in similar counties and other older industrial cities throughout the state and the country.

In addition to the geographical boundaries, the need to develop agreed upon definitions for what constitutes a "green" job is a critical component for any proposed policy and incentive strategy moving forward. For the purposes of this report, the following terms have the following agreed upon meanings.

Green:

- Products, services, policies, operations, activities, and practices that contribute to meeting the needs (of everyone, of all species) of today without compromising the ability of future generations (of everyone, of all species) to meet their own needs.

Green Market:

- Market sectors that provide 'green' jobs within their workforce. These markets include;
 - Green Buildings/Retrofitting
 - Green Building Product Manufacturing
 - Renewable Energy
 - Wind
 - Solar
 - Biofuels



- Biomass
- Geothermal
- Mass Transit/Rail
- Clean Automobiles
- Waste Management/Recycling
- Green Chemical Manufacturing

Green Job:

- Can be entry-level, mid-level, or advanced-level jobs
- Employees receive full-time living wages (and prevailing wages in the construction sector) with affordable quality healthcare and retirement benefits for work completed in a safe working environment
- Employment is free of discrimination and employees have full rights to collective bargaining.
- Jobs provide opportunity for advancement (career track) through industry recognized training such as registered apprenticeships, or accreditation.
- Can be “Root Occupations” requiring traditional training and/or skills applied for “green” outcomes
 - Green product manufacturing
 - Mass-transit/Rail maintenance and operation
 - Waste Management/Recycling
- Can be “Derivative Occupations” requiring advanced training and/or skills for “green” outcomes
 - Construction
 - Energy (solar, wind, biomass, design and installation/maintenance)
 - Design and Engineering (of buildings, products, vehicles, etc.)
 - Policy, advocacy, and analysis



Green Business/Employers:

- Employers that support “Green Jobs”, AND
- Are involved in a “Green Market” as defined above, OR
- Facilities housing the “Green Jobs” meet one or more of the following standards;
 - LEED Certification of facilities through
 - LEED-NC or CI (New Construction, or Commercial Interiors)
 - LEED-EBOM (Existing Buildings Operation and Maintenance)
 - Energy Star Certified
- Organization meets one or more of the following standards;
 - ISO 14001 Certified Organization
 - SA 8000 Certified Organization
- Products manufactured/produced meet one or more of the following standards
 - ISO 14062 Certified
 - SMART Certified
 - Cradle to Cradle Certified
 - FSC Certified
 - Green Seal Certified
 - Green Label Plus Certified
 - WaterSense Certified
 - Energy Star Certified
 - Greenguard Certified
 - USDA Organic Certified
 - FairTrade Certified
 - Score of 40 or above in the ACEEE Green Car Guide
 - Rating of “Superior” for vehicle class in the ACEEE Green Car Guide

Existing Economic Development Strategies

The City of Cincinnati, and the southwest Ohio region as a whole, has committed significant effort to two important economic development and market studies for the region. It is critical that the findings of this report and the proposals moving forward align with these existing economic development frameworks, rather than compete. These two reports, GO Cincinnati, and Agenda 360, provide many recommendations that support green jobs, and these recommendations should continue to be pursued. The proposals of this report are intended to supplement, enhance, and reinforce the findings of both reports, as outlined below.

GO Cincinnati

Completed in January of 2008, the GO Cincinnati “Growth and Opportunities” project is an economic development report focused on identifying place-based development, economic development delivery models, workforce development programs, and transportation and infrastructure improvements that will increase city revenue, create up to 5,000 new jobs, and keep new regional jobs within the city.

The key recommendations for place-based development include investing in the development of a “green industrial park” in the Queensgate/South Mill Creek area. This initiative works well and reinforces findings of this report – there simply are not enough available manufacturing sites within the urban core to successfully attract significant new manufacturing, and efforts to increase available sites that are geared toward green manufacturing is an essential strategy.

Similarly, GO Cincinnati recommends focusing development efforts that support jobs in chemical and advanced manufacturing sectors, both job areas that are projected to grow significantly, and with the



right investment, could support a high proportion of 'green collar' jobs.

The recommendations for economic development delivery call for creation of several programs and councils to provide alignment, outreach, and oversight of economic development strategies to ensure that they are in alignment with the identified target areas. Again, a key finding of this report is to create a similar body, or Green Jobs Council, and to align programs. This body should be integrated with the GO Cincinnati proposals for a Business Retention and Expansion Program, the Development Authority, and the Opportunity Advisory Councils.

Workforce development recommendations of GO Cincinnati also call for the creation of a single entity made up of a collaborative of stakeholders. Clearly, the proposal of this report for a Green Jobs Council can be integrated to assist in aligning workforce development resources, goals, and target industry sectors towards support of green collar jobs.

Finally, the recommendations of GO Cincinnati to improve transportation and infrastructure through rail transportation such as the streetcar, with an emphasis on "green" high-performance" infrastructure and a region wide system further reinforce the proposals of this report. Rail transportation is a key green market that can support high quality jobs, while at the same time create lasting value for the communities which it serves.

Agenda 360

Agenda 360 is a "Regional Action Plan" developed by a collaboration of more than 30 community organizations with the Cincinnati USA Regional Chamber. The goal of Agenda 360 is to "transform the region, by 2020, into a leading metropolitan region

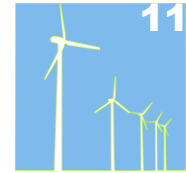
for talent, jobs and economic opportunity for all who call our region home." The action plan outlines six key "imperatives" for which goals and metrics have been developed. They include Quality Place, Business Growth, Qualified Workforce, Transportation, Inclusion, and Government Collaboration.

The Quality Place imperative reinforces green investment strategies by promoting integration of smart growth and green planning concepts, brownfield redevelopment, and expansion of place-based investment. It also reinforces green investment by promoting the proposals of the Go Cincinnati report regarding the Queensgate/Mill Creek "Eco-Industrial Park". Agenda 360 outlines four specific initiatives to promote green development in the region, and all of them align well with the findings of this report.

Agenda 360 proposes to support green initiatives throughout the region, promote adoption of Smart Growth, and LEED green building standards, increase and connect the tree canopy throughout the city, and promote adoption of green practices by individuals and families at home. Each of these recommendations will enhance demand for green construction, green products, and reinforce the identity of the region as a green area. All of which is necessary to support the recruitment of new green jobs to the region, and reinforce the need to green our existing jobs.

Some of the economic clusters which Agenda 360 identified as strengths to the region include automotive, chemistry and plastics, and advanced energy. In addition to reinforcing this report's findings, these industry clusters all have capacity to support large numbers of green jobs.

In regard to creating a quality workforce, Agenda 360 outlines strategies to improve the entire educational system from "birth to grade 16", increase college graduation, and align workforce training



with job placement efforts. Agenda 360 recognizes the Greater Cincinnati Workforce Network, an initiative launched to respond to GO Cincinnati recommendations, Vision 2015, and other calls for alignment of workforce development in the region.

The Greater Cincinnati Workforce Network is focused on supporting Health Care, Construction, and Advanced Manufacturing sectors. The initiatives being undertaken by the GCWN in construction and advanced manufacturing sectors align well with promotion of green jobs within the region. The proposal of this report to create a Green Jobs Council is not intended to replace the Greater Cincinnati Workforce Network, or to suggest that the programs focused on advanced manufacturing and construction are not considering green jobs in their work. Instead, the proposal to create a Green Jobs Council in the region could integrate successfully with the GCWN, and could further reinforce the efforts in these areas, while promoting green jobs in other market sectors as discussed.

The transportation recommendations of Agenda 360 include promotion of regional transportation, and multi-modal transportation including bike, rail, and streetcar systems. These proposals clearly align with the creation and support of green jobs in rail transportation.

The final recommendation of Agenda 360 focuses on collaboration of local government including shared services between municipalities, increasing regional collaboration, and exploration of multi-jurisdictional revenue sharing. These proposals are critical for the success of green industry in the region. The proposals outlined in this report include alignment of green job efforts, policies, and incentives, and the “greening of government”.

With the array of existing policies, regulations, and incentives, recruitment of new green jobs and advancement of green jobs for existing companies requires a streamlined, supportive, and ‘green’ government that can assist companies in navigating these incentives and regulations.

It is clear that these two existing economic and workforce development reports are poised to support and enhance green jobs within the region. Many of their conclusions regarding market opportunities reinforce the findings of this report, and the proposals soundly align as well.

Integration of the key recommendations from this green jobs report can and should be coordinated with the existing plans and networks outlined. It is imperative that the creation of a Green Jobs Council include these existing coalitions including local government, Agenda 360, the Cincinnati USA Chamber, the Greater Cincinnati Workforce Network, local union leaders, local colleges and technical schools, and workforce investment boards to ensure that the recommendations of this report are integrated to enhance current efforts.



Regional Market and Workforce

Emersion DESIGN engaged with the Ohio Skills Bank – a consortium of Ohio community colleges to collect and analyze current Department of Labor job statistics for our region. Because there is no standard occupation classification for “green jobs”, data was pulled for job classifications that fit within the general markets being considered (see “Green Market Sectors” definition above). This included metal, plastic, electronic, and chemical manufacturing, assembly of engines and engine components, air, and rail transportation, in addition to power generation and distribution occupations, and waste management. Construction occupations were also considered, and included all residential and commercial construction building trades.

According to Economic Modeling Specialists, Inc. (EMSI), data from the 2nd quarter of 2009, greater Cincinnati supports around 52,900 manufacturing, transportation, waste management, and energy related occupations, and an additional 52,500 construction related occupations.

Because there is not a distinction by the Department of Labor between a “green” manufacturing or construction job and a traditional one, many studies have attempted to break the number of green jobs out of these figures through various methods. According to the U.S. Conference of Mayors *Current and Potential Green Jobs in the U.S. Economy* report, the Cincinnati area reported 4,220 green jobs in 2006, but projects 33,398 new green jobs by 2038. According to the National Governors Association Center for Best Practices, in 2007 the entire state of Ohio supported 35,430 green jobs – this figure is more than double the 16,884 statewide green jobs according to the U.S. Conference of Mayors report, but is close to the 35,267 estimate by the Pew Charitable Trusts report. While it is possible that the state saw a doubling of green jobs from 2006-2007, it is unlikely.

It is reassuring to note however, that although the methodologies and definitions of what constitutes a ‘green job’ vary from report to report, that in

each report, Ohio is considered one of the States best suited to benefit from investment in green markets, and best suited to support robust green market activity. This can be seen in the current jobs data for occupations in each of the target markets by comparing the location quotient of each job category.

The location quotient for a particular job category is an indicator of how concentrated that particular occupation is in comparison to the national average. A location quotient of 1 indicates an average representation of a particular job within the region as compared to the rest of the nation. A location quotient below 1 indicates below average concentrations and a lack in regional skill, and a location quotient above 1 indicates a regional strength.

By analyzing the current Ohio Skills Bank data using a location quotient breakdown, it becomes clear that greater Cincinnati has a very high concentration of occupations that dovetail with the green markets identified in this report. The following figures locate the top 10 occupations by location quotient, the bottom 10 occupations by location quotient, and the occupations with the highest projected growth in location quotient between 2009 and 2016 according to EMSI.

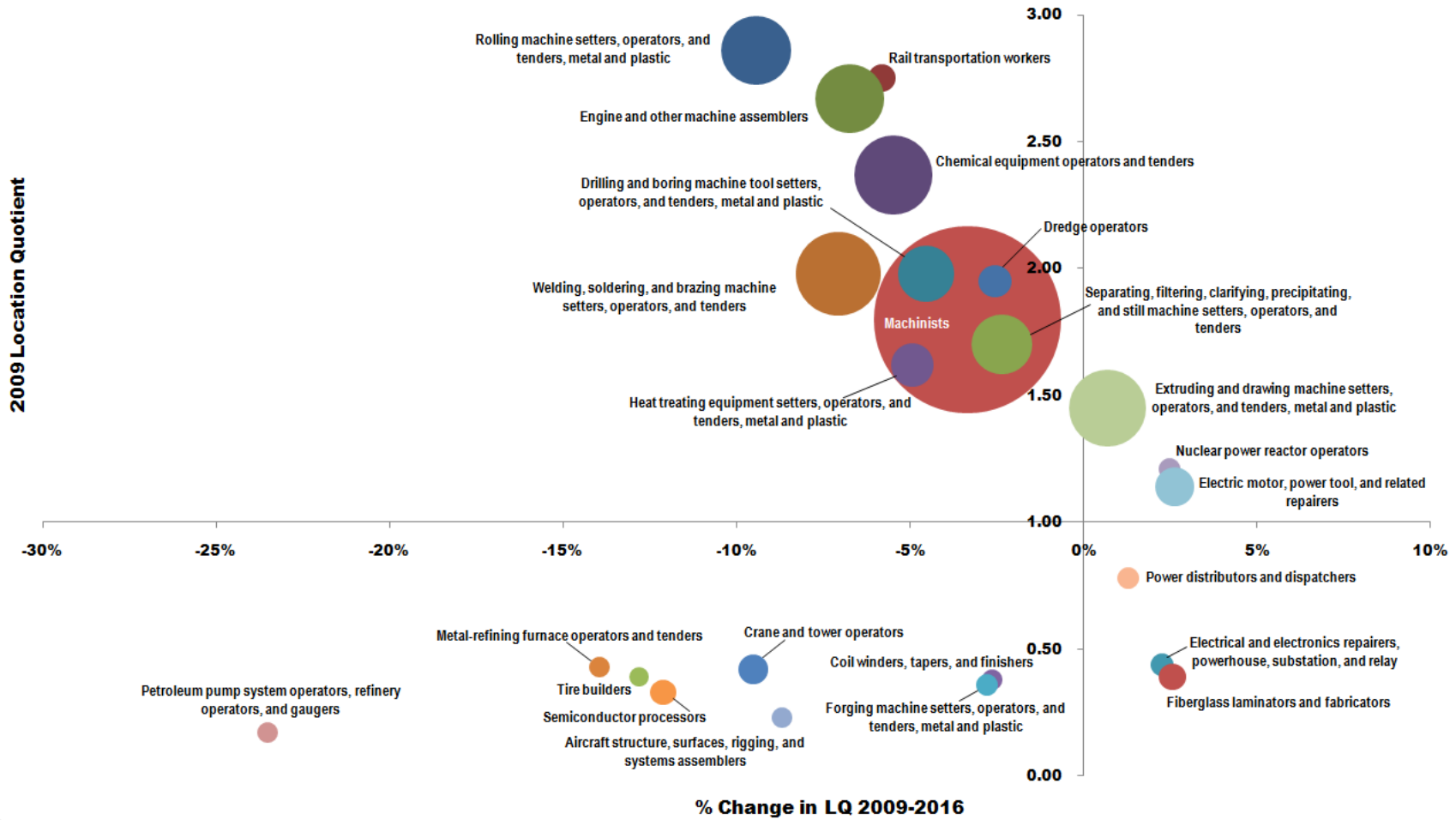
On the following charts, each of these occupations is represented by a circle plotted according to the projected % change in location quotient along the x-axis, and the current location quotient along the y-axis. The relative size of each circle represents the total number of that occupation. These charts are useful in identifying workforce strengths and weaknesses.



Manufacturing, Rail, and Waste Management Occupations

Location Quotient 2009 -2016

Data by EMSI, Graphic by emersion DESIGN

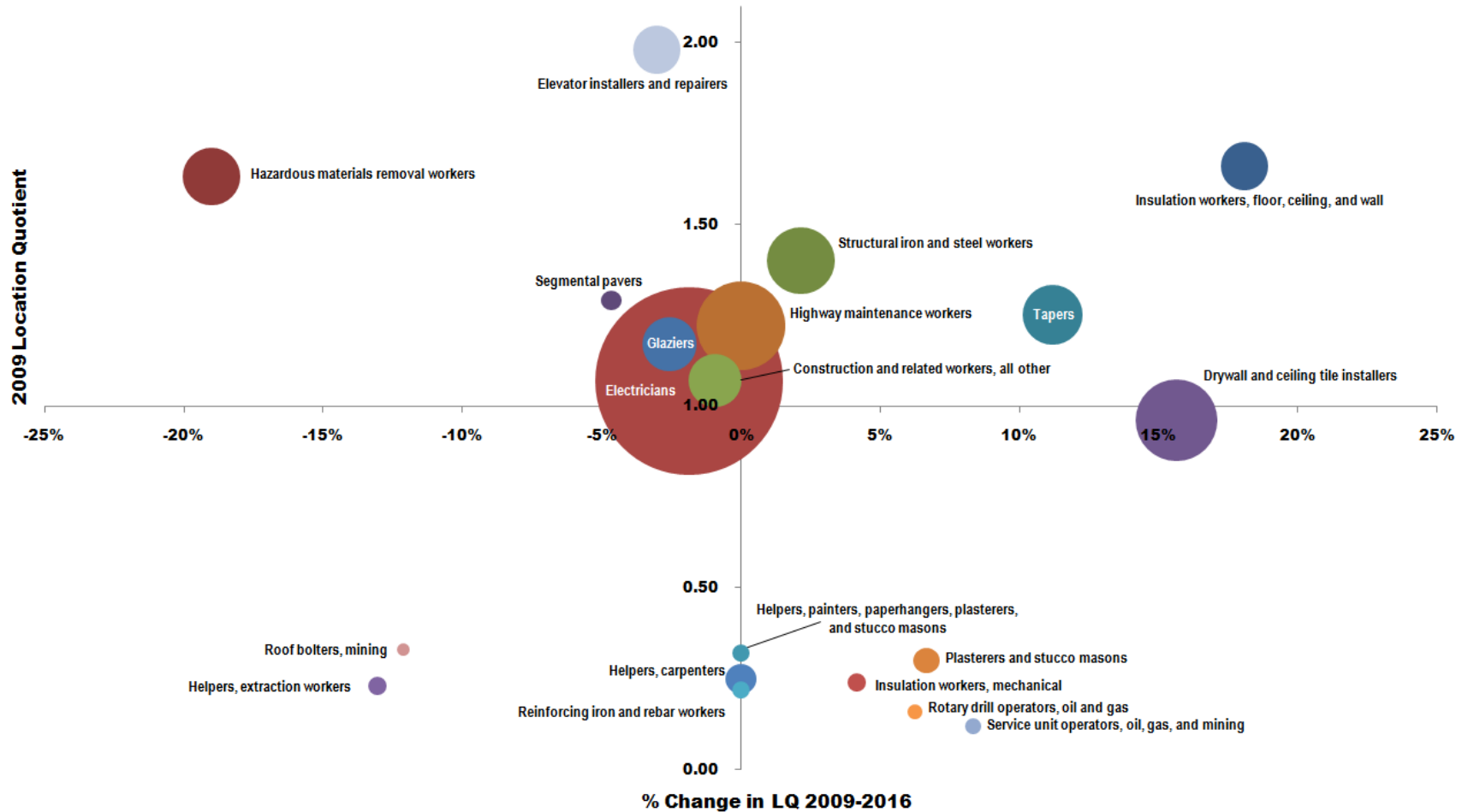




Construction Related Occupations

Location Quotient 2009 -2016

Data by EMSI, Graphic by emersion DESIGN





Of the manufacturing, transportation, and waste management occupations, key regional strengths in metal working occupations including rolling machine operators, welding machine tenders, drilling and boring tool setters, and machinists jump out – indicating a strong skill base available for metal working and manufacture of wind turbine components. Additionally, rail transportation workers, engine assemblers, and chemical equipment operators all have location quotients well above 1.5, indicating regional strength in these industries, and potential green markets that could be supported in the region.

Manufacturing occupations with the lowest location quotients that overlap with green markets include semiconductor processors (critical for photovoltaics, or solar electric), fiberglass laminators and fabricators (used as light-weight body panels in many fuel efficient vehicles), coil winders (needed to produce generators in wind turbines), and occupations related to power distribution (critical to the upgrade of existing transmission grids).

While the region is strong in metal working and has access to the Ohio River for barge transport of large wind turbine components, it is clear from this analysis that an attempt to promote wind manufacturing in greater Cincinnati would require additional support in occupations such as coil winders. Similarly, while there is a large skill base for engine assembly and rail workers, there is a lack in fiberglass laminating and fabricating needed for full vehicle assembly in the region. The low location quotient for these occupations indicates a need for advanced training and incentives for individuals to enter into those trades to support these key green markets.

The occupations that EMSI projects with the highest growth in location quotient included power distributors, nuclear power operators, and substation electric workers. All of these occupations were ranked with a change in location quotient of around 2.5%, indicating modest growth in the concentration of these occupations in the region. With nuclear reactor operators as the exception, this small increase in concentration would not be enough to move these occupations to location quotients above 1.0.

Therefore, while nuclear reactor operators are, and will remain, a regional strength, power distribution and substation workers, as well as fiberglass laminators and fabricators will continue to be below the national average concentration according to EMSI.

The location quotient graph for the construction trades is similarly telling when overlaid with a lens of green construction. While all construction trades will benefit from green building, some trades will see a bigger shift in skills required than others. For some, simply understanding the dynamics of on-site construction waste management is all the additional knowledge that is required for them to contribute to the successful completion of a green building. For others, significant new knowledge, skills, or abilities are required.

Within the context of the construction occupations analyzed, it is clear that electricians play a major role in greater Cincinnati, not only by location quotient, but by sheer number. Electricians play an important role in green buildings, due to lighting controls and systems, and on-site renewable energy integration such as photovoltaics. Ensuring that the electrical workforce is skilled in installation of these new technologies is a critical strategy to support and promote green construction in the region. Other regional strengths indicated by location quotient include insulation workers, hazardous material removal. Both of these trades are critical for construction of green buildings. Structural steel workers are also located in a high concentration. Many green building teams pursue steel frames for the virtue of steel's high recycled content, and this occupation should continue to remain a regional strength.

None of the construction occupations that fall in the bottom 10 by location quotient would require significant new knowledge, skills, or abilities to contribute to green building teams. Many of these occupations include 'helpers' of carpenters, painters, and extraction workers, and while these occupations contribute to green buildings, the skill shift to 'green' does not require significant training efforts.



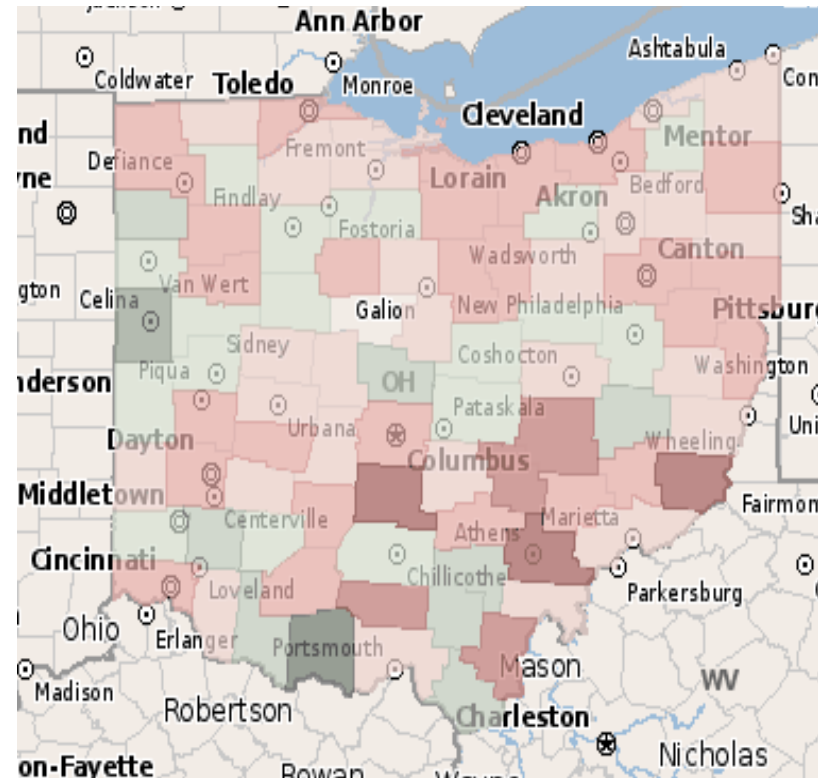
By overlaying the existing strong occupational classifications with green markets identified, it becomes clear that the current workforce is ideal for supporting green building, pushing wind component manufacturing requiring large amounts of steel and metal work, supporting expansion of rail transportation, increasing assembly of alternative fuel and high efficiency vehicle engines, and developing green chemicals such as new insulations, and 'green' chemical substitutions for current chemicals.

However, EMSI projects that many of these occupations will experience up to a 10% decline over the next 7 years. Clearly, for manufacturing to remain a vital part of the greater Cincinnati economy, efforts must be made to reinforce the existing occupational strengths.

Manufacturing Location Trends

In addition to understanding key skills and occupations of the region, it is important to consider location trends of manufacturing companies. According to an EMSI report on Ohio manufacturing trends, Ohio saw a shift of manufacturing base from urban centers to more rural counties between 2002 and 2007. As indicated on the map to the right, counties with large urban centers saw a decline in the number of manufacturing companies during this time as shown in red. While manufacturing numbers for the state as a whole declined, the rural counties indicated in green actually saw an increase in the number of manufacturing jobs.

Additional consideration must be given to available manufacturing sites. As identified in the Go Cincinnati Report, while there are some sites within the urban center of Cincinnati that are positioned well for new manufacturing, they represent a very small portion of available sites. In fact, according to the Ohio Department of Development, Hamilton County currently has over 2,000 existing manufacturing locations, and only 41 sites that are available



Map by EMSI, *Recent Trends in Ohio Manufacturing*, March 2008.



for new companies to locate a manufacturing business. In contrast, Butler, Warren, and Clermont counties each have over 100 available sites, and combined, have over 700 sites available for new manufacturing. This further reinforces the urban to rural trend that EMSI identified.

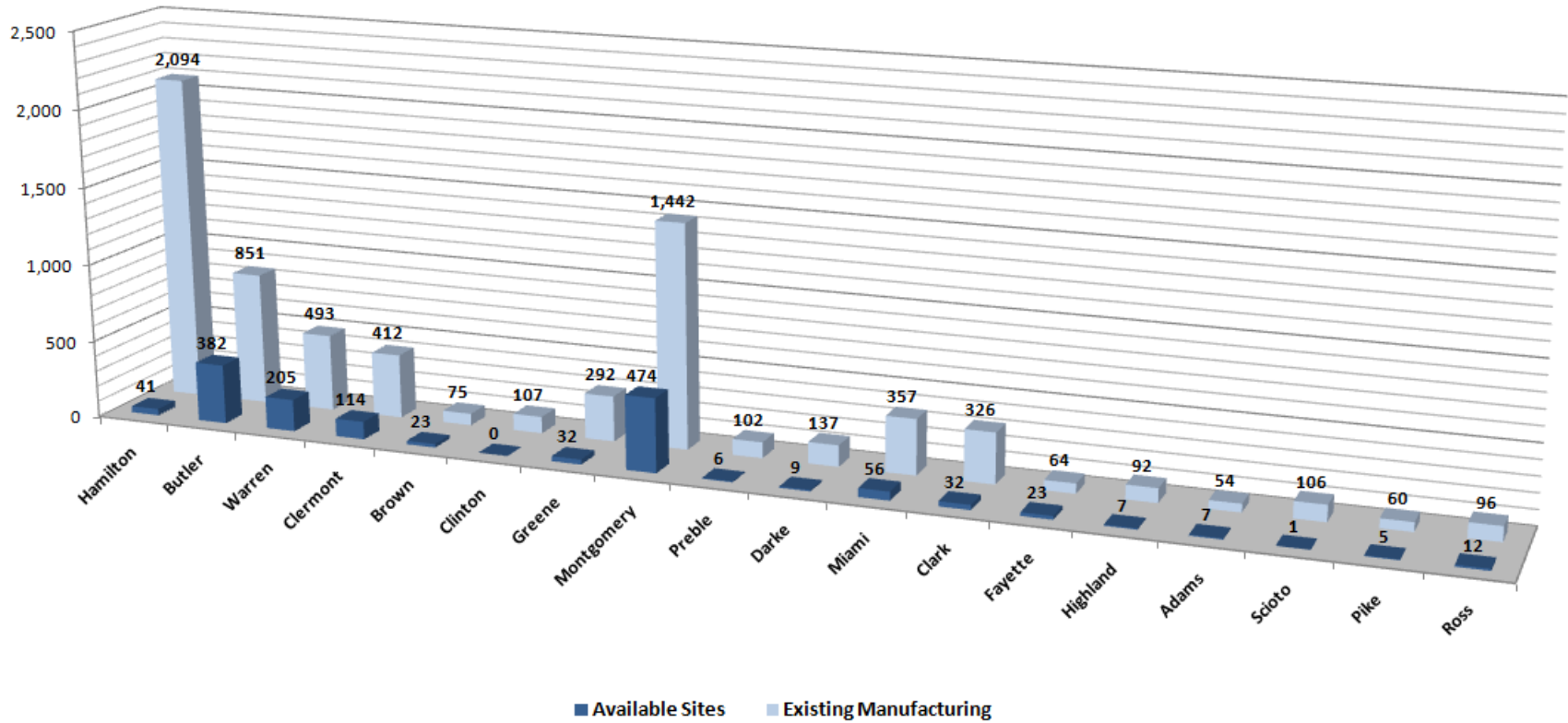
This reveals two important points that must be considered. First, for greater Cincinnati to maintain manufacturing jobs in its urban center, efforts should be made to create more available sites throughout Hamilton County, such as those suggested in the GO Cincinnati Report. It is simply a matter of odds that a new company looking to relocate will most likely end up in one of the outlying counties rather than Hamilton County, simply by virtue of the number of options available to them.

Second, although Hamilton County has the smallest ratio of available to existing manufacturing sites (41/2,094), the outlying counties of Butler (382/851), Warren (205/493), and Clermont (114/412) also have far more existing manufacturing than available manufacturing sites. It is clear that for the region to transition from traditional to green jobs, it cannot happen simply by bringing in new industry and forgetting the old. Any strategy to transform the economy of greater Cincinnati to a green job economy will require the transition of its existing manufacturing base. Therefore, a primary goal for any efforts moving forward should revolve around supporting existing manufacturing and preserving existing jobs, by helping them to become “green-er”.



Manufacturing Locations in Southwest Ohio

Ohio Department of Development Data





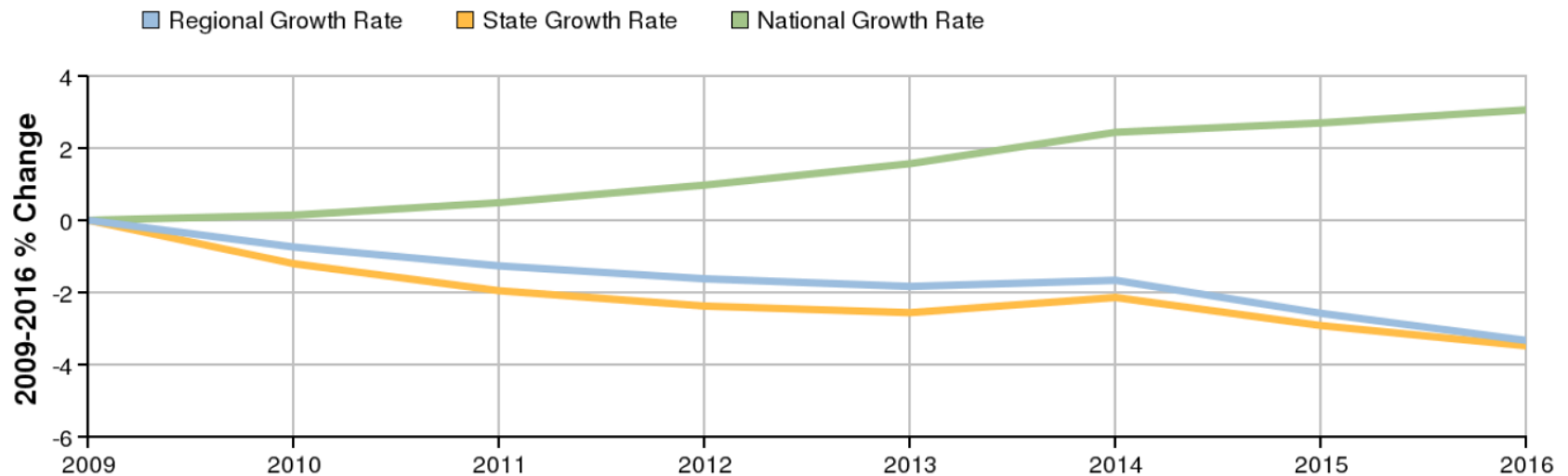
The China Question

According to EMSI job data, manufacturing occupations in greater Cincinnati and throughout the state will continue to decline through 2016. This begs the question – where are they going? Are we losing our manufacturing base to China? Is the US economy moving away from manufacturing toward a service based economy?

To answer these questions, we can simply look at the same projections from EMSI about manufacturing jobs for the nation. The chart below indicates manufacturing jobs in greater Cincinnati compared to the growth rate of the state and the nation.

While the state and region are projected to decline by approximately 4% by 2016, the nation as a whole is expected to increase by nearly 4% in the same time. Clearly, there is opportunity for manufacturing in the US. The challenge and opportunity for greater Cincinnati, and the state as a whole, is to implement policies and programs that retain or reverse the trend line as projected by EMSI.

In Daniel Luria and Joel Rogers essay, *Manufacturing, Regional Prosperity, and Public Policy*, they address many of the common misconceptions about the cause of declining manufacturing in the US. Many attribute manufacturing decline to increases in technology and efficiency that require fewer and fewer human hands involved in the process. This claim they dispute by looking at efficiency improvements among different manufacturing industries.



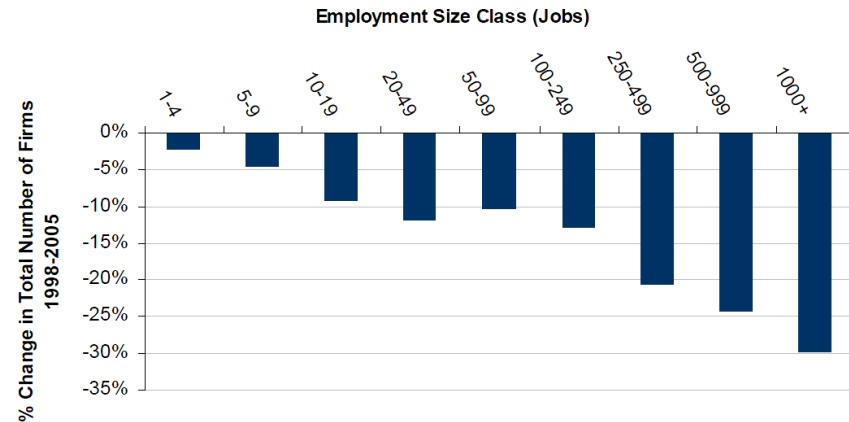


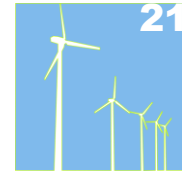
According to their research, overall manufacturing productivity increased by about 4.4% annually between 1990 and 2004. However, when broken out by industry classification, they claim that the vast majority of industry productivity did not increase enough to reduce the total number of jobs. According to their research, 90% of the manufacturing industries posted only 1% productivity gains, while the productivity gains in computer and electronic product manufacturing increased almost 40% annually, skewing the “total manufacturing” productivity growth to a much higher number than it actually was.

In addition to the urban to rural shift identified by EMSI, in the same report about Ohio manufacturing, they identified a trend in the size and nature of successful manufacturing in Ohio. Their conclusions are that the firms that have been successful in Ohio are those that are “smaller, more productive, higher-tech, and higher paying.” They site an increase in value of manufactured goods in Ohio, and a slower rate of decline for smaller firms.

Clearly, manufacturing can still remain a vital part of the greater Cincinnati economy. The challenge will be crafting policy and supporting the manufacturers that will have a high chance of success. Those are manufacturers that are providing ‘green jobs’- well-paying, productive, and high-tech jobs.

Smaller Manufacturing Firms Have Been More Resistant to Economic Conditions





Federal, State, and Local Green Jobs Investment

It stands to reason that green investment creates green jobs. Without contracts in hand, consumer demand, or orders placed, no jobs are needed. The key question facing any community encouraging green job creation is to understand the current investment in green strategies including public and private investment, and shape their future policies and programs to fill gaps and enhance existing investment frameworks.

Federal Investment Overview

2009 marks a historic point for investment in green technologies throughout the world. The amount of money being invested in green technology and green markets through national government economic stimulus spending is staggering.

Nearly every developed nation is pumping billions of dollars into green industry research and development at the same time. According to the Financial Times, China leads the way with over \$218 billion, followed by the United States with \$117.2 billion. Although the total economic stimulus spending of the US government eclipses most all other countries spending combined, the percentage targeted specifically for green investment is relatively low. When China invests \$100 billion dollars more in green markets, it is clear that the US as a whole will have to be more creative, inventive, and targeted with its investment in green markets in order to remain competitive in global markets.

On October 27, 2009, President Obama announced the distribution of \$3.4 billion dollars from the DOE to be invested in upgrading the electrical distribution grid in the US. Duke Energy received a grant of \$200 M, half of which they expect to spend in the Cincinnati region rolling out their SmartGrid technology including new distribution lines, and new meters for 700,000 customers that will help distribute energy more efficiently, and will

set the stage to allow for dynamic electric purchasing. This is the largest investment in the US electrical distribution system ever, and although Duke does not yet know the number of jobs that will be created, it is clear that it will create a significant need for electrical workers. Below are two other federal investment programs that channel significant funding to manufacturing projects in green industry.

U.S. Department of Treasury – Renewable Energy Grants

Funded through the American Recovery and Reinvestment Act of 2009 (ARRA), this federal grant is available to commercial, industrial, and agricultural applicants for installation of renewable energy technology including solar electric, solar thermal, fuel cells, small wind turbines, microturbines, and combined heat and power systems. Grant amounts are 30% of cost for fuel cells, solar systems, and small wind, and 10% of cost for all other systems. Program Information: <http://www.treas.gov/recovery/1603.shtml>

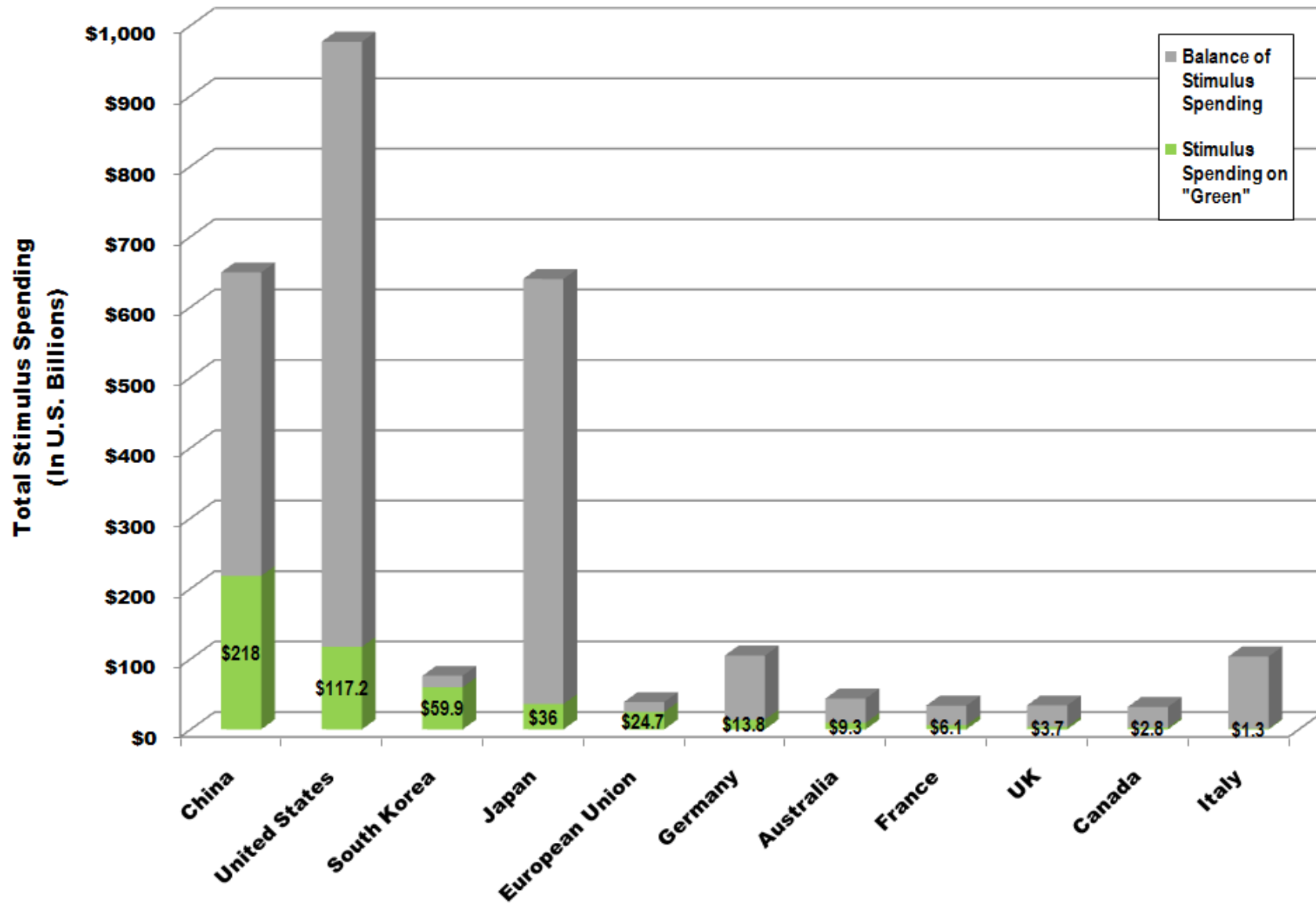
U.S. Department of Energy – Loan Guarantee Program

This program will provide loan guarantees for projects over \$25 million for manufacturing facilities and manufacturing projects that incorporate or produce components related to solar electric, solar thermal process heat, wind, hydroelectric, renewable transportation fuels, fuel cells, biodiesel, tidal energy, and significantly improved daylighting technology. Program Information: <http://www.lgprogram.energy.gov>



International Stimulus Spending

Data from Financial Times, Graphic by emersion DESIGN





State of Ohio Investment Overview

The State of Ohio has a significant number of programs and initiatives already in place to support and invest in green jobs. The Pew Charitable Trusts report on the Clean Energy Economy lists Ohio venture capital investment in the green markets at \$74,224,000 from 2006-2008, putting Ohio in 17th place when it comes to investing private money. But venture capital is only half the story. Money is being invested in green technologies and green markets. The following is a survey of state sources that provide direct investment through grant or loan programs for purchase of “Green Market” technologies, or for development of “Green Market” technologies.

Ohio’s Third Frontier Program

The Third Frontier Program is a 10 year, \$1.6 billion dollar investment program that began in 2002. According to a report just released by SRI International, approximately \$681 million dollars has already been invested through this program through various research, development, and start-up grants. Of the total awards so far, \$39.9 million dollars has been awarded for fuel cell research and development programs, and \$19.9 million has gone into other forms of advanced energy programs. Additional R&D grants in advanced technology including polymers, nanotechnology, PV’s, and fuel cells are expected to continue to be awarded through 2012.

Ohio Job Stimulus Plan – Advanced Energy Program (Ohio Air Quality Development Authority)

This fund was created in 2008 to provide grants of \$50,000 to \$250,000 and loans of \$1 million to \$2 million for a wide variety of advanced energy projects including energy efficiency, cogeneration, solar, wind, geothermal, hydroelectric, fuel cells, biogas, electricity storage, and some biomass and solid waste technologies. Funds are also available to support technologies,

products, activities, and management practices or strategies that reduce energy consumption.

Many sectors are eligible for this program including industrial; however, advanced energy manufacturing centers partnered with any Edison Technology Center will be evaluated under a separate RFP process. The goals of this program are to support workforce development in advanced energy, support projects that will make a substantial difference for the industry, and strengthen Ohio’s existing manufacturing and technology base while preparing the workforce for future products and industries.

Program Information:

http://ohioairquality.org/advanced_energy_program/program_details.asp

Ohio Department of Development – Advanced Energy Fund Program Grants

Ohio’s Advanced Energy Fund was created in 1999 through a “public benefits fee” collected by the Ohio Department of Development’s Office of Energy Efficiency through a uniform fee on the electric bills of the four investor-owned utilities operating in Ohio. From the Advanced Energy Fund, the ODOD distributes grants for advanced energy and energy efficiency technology implementation for commercial, industrial, and residential applications. This program is currently slated to end by January 1, 2011.

Germane to this report is the *Advanced Energy Fund Manufacturing Energy Efficiency Grant*, with 25% of project cost (up to \$50,000) available for manufacturing facilities to install energy efficiency equipment including lighting, lighting controls, chillers, furnaces, boilers, heat pumps, air conditioners, combined



heat/power, cogeneration, energy management systems and controls, insulation, windows, and motors.

Program Information:

<http://www.odod.state.oh.us/cdd/oeeflgrant.htm>

Hamilton County Investment Overview

Hamilton County is one of 42 counties across the nation that is signatory to the Cool Counties Initiative, and Hamilton County administers some of the most progressive investment strategies in the country through the Green Demonstration Programs, as outlined below.

ARRA Funds

Hamilton County has received over \$200 million in stimulus funding through the American Recovery and Reinvestment Act. According to Ohio Recovery Accountability reports, this money has been allocated to six different program areas including “Infrastructure, Crime and Public Safety, Education, Energy and Environment, Healthcare, and Work, Opportunity, and Poverty.”

The vast majority of the funding (over 80%) will be allocated for programs that do not explicitly link the program to Green investment, although several of the categories could be counted as ‘Green’. Examples include \$5M going toward the Banks Transit Center which will be designed to incorporate multi-modal transportation options including car, bus, and the planned streetcar system. Another example is the \$618,000 YouthBuild Grant Program, which was awarded to the Easter Seals Work Resource Center providing job skills and training to young adults including deconstruction and architectural salvage/waste management skills.

Approximately 14% of the ARRA Funding reported to the State of Ohio is being spent in the Energy and Environment category,

including around \$12 million through the Energy Efficiency and Conservation Block Grant program, and \$11 million allocated to Home Weatherization Assistance programs through the Cincinnati-Hamilton County Community Action Agency. The Cincinnati-Hamilton County Community Action Agency is projecting 1,328 households will be weatherized through this infusion of funding. Statewide, the projected number of weatherized homes is over 32,000, and could significantly increase demand for insulation and high efficiency fixtures throughout the state.

Energy Efficiency and Conservation Block Grant

The Energy Efficiency and Conservation Block Grant funding was distributed through the State of Ohio to each community throughout Ohio. The focus of these funds is to reduce energy use in government owned facilities through energy efficiency upgrades and management programs. Many municipalities utilize Energy Service Contracts to capture guaranteed energy savings. Although this program does not specifically target manufacturing, the resulting increased demand for energy efficient fixtures, insulation, and other green building products could affect this sector.

MSD Green Demonstration Program

As a result of a 2001 citizen suit, the Metropolitan Sewer District of Greater Cincinnati (MSD) is under a Consent Decree with the U.S. Department of Justice, the U.S. Environmental Protection Agency, and the State of Ohio to correct the Sanitary Sewer Overflow (SSO) and Combined Sewer Overflow (CSO) problems associated with current sewer infrastructure in Cincinnati and Hamilton County by 2022. The plan developed by MSD to correct these issues revolves largely around using sustainable storm-water management practices on project sites to keep storm water from even entering the system.

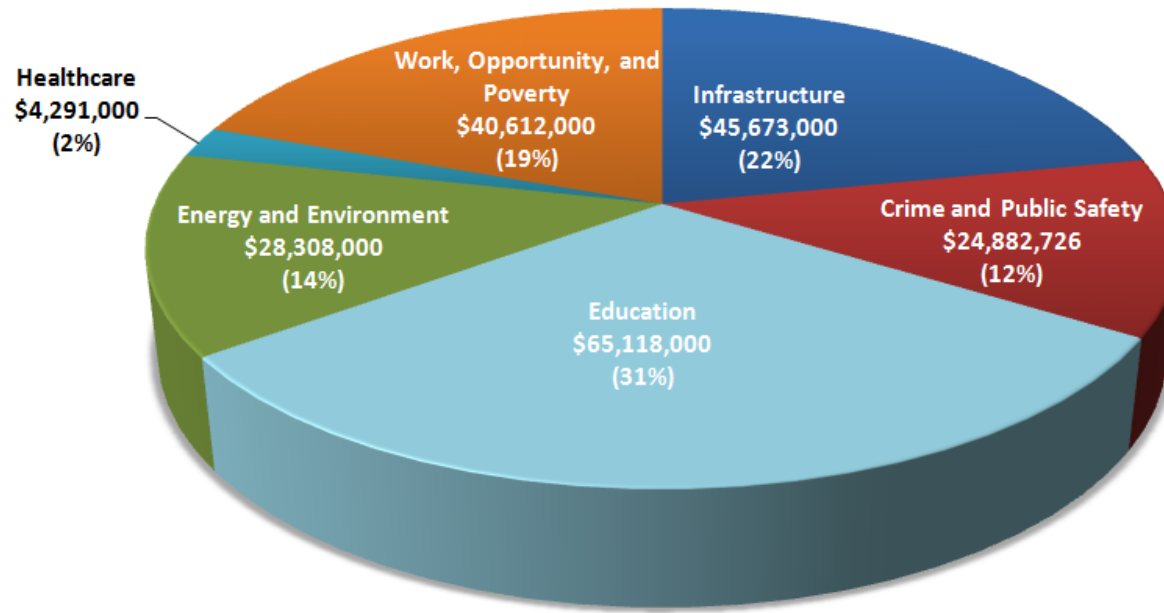


The center piece for accomplishing the arduous task of sustainably eliminating the CSOs hinges upon the success of the MSD Green Demonstration Project Grant. This grant is divided into two phases to assist MSD in determining suitable recipients. The first phase focuses on the design portion. A team of professionals assemble and plan a strategy for reducing the stormwater that enters the municipal pipe system.

Then, a proposed fee and strategy outline is submitted to the Sewer District for approval. Once accepted, the team is charged with designing the system and providing calculations and cost estimates for MSD to judge the cost/ benefit of the proposal. The second phase of the grant, if accepted, will pay for the upgrade of the selected bio-strategies from base line capital improvements.

ARRA Stimulus Contracts in Hamilton County, by Department

As of July 20, 2009, Ohio Department of Development





City of Cincinnati Investment Overview

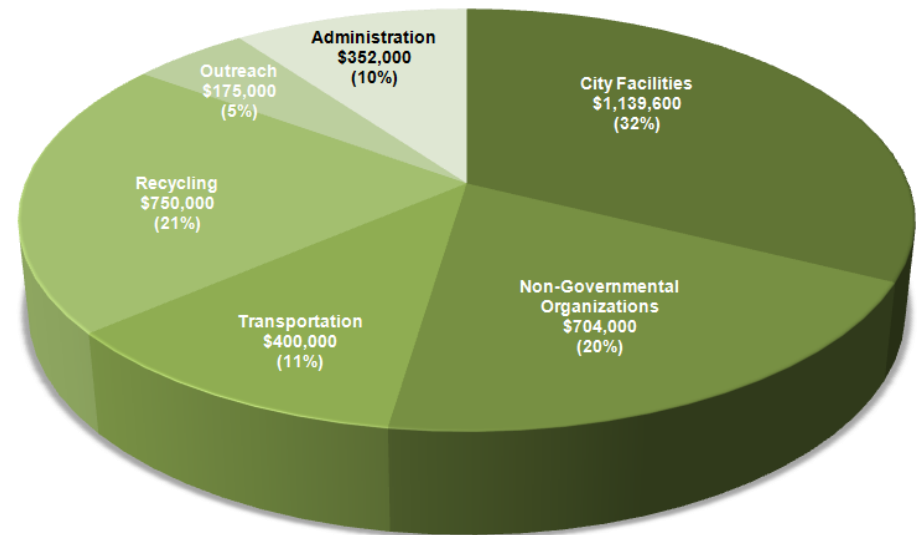
Energy Efficiency and Conservation Block Grant

The City of Cincinnati Office of Environmental Quality applied for EECEBG funding from the U.S. Department of Energy. Of the total \$3.5 million, approximately 30% will be directed towards energy efficiency improvements for City facilities, another 17% will go toward the Cincinnati Energy Alliance, which will focus on providing a revolving loan fund for private facilities. The balance of the funds will be directed towards program enhancements and initiatives that support increased recycling, bicycle transportation and education or outreach. The effect of the EECEBG funds from the City of Cincinnati will increase demand for energy efficiency products and technicians, but does not appear to impact the green manufacturing sector in other ways.

Green Roof Loan Fund

The City of Cincinnati Office of Environmental Quality is currently working in partnership with the Ohio EPA, and the Metropolitan Sewer District of Greater Cincinnati to develop a low interest loan program for green roofs. The program has not yet been finalized, but it is anticipated to be publicly announced in late 2009 or early 2010. While this program does not specifically impact the manufacturing sector, there is a possibility for increased demand for green roof components.

**City of Cincinnati
Energy Efficiency and Conservation Block Grant Spending**





Private Rebate Programs

Green Energy Ohio (GEO) Solar Thermal Rebate Program

This private rebate program is managed by the non-profit Green Energy Ohio. The rebate is available for solar water heating systems for residential and school applications. While this is not a direct investment in manufacturing technology, it supports and creates demand for solar thermal hot water systems in the region.

Program Information:

<http://www.greenenergyohio.org/page.cfm?pagelD=2295>

Duke Energy Commercial/Industrial Energy Efficiency Rebate Program

The utility provider in southwest Ohio, Duke Energy, offers modest rebate incentives for energy efficiency technologies in commercial, industrial, school, and other institutional applications. While the direct dollar value of the rebate might be small – it varies by technology and is capped at \$50,000 per year, the rebate program is another investment that supports a market for energy efficiency technology in the region.

Program Information:

<http://www.duke-energy.com/ohio-business/energy-management/energy-efficiency-incentives.asp>



Federal, State, and Local Green Jobs Policies

The current policy landscape in Cincinnati and Hamilton County is a progressive and strong combination of policies. Policies ranging from mandates and rules to tax incentives are currently in place painting a picture of communities that value sustainability and are preparing their workforce for green jobs. The objective of this report is to identify policies and proposals to encourage Green Jobs in Cincinnati and Hamilton County. In order to better understand what policies and incentives might work best for this region, it is first necessary to understand the existing policy frameworks in place from Federal, State, and local agencies. After understanding the full picture, policy proposals can be considered that might enhance existing programs, or fill gaps in the existing overlapping policies and incentives.

Federal Policy

Qualifying Advanced Energy Manufacturing Investment Tax Credit

The ARRA established a new investment tax credit to encourage the development of a U.S.-based renewable energy manufacturing sector. In any taxable year, the investment tax credit is equal to 30% of the qualified investment required for an advanced energy project that establishes, re-equips or expands a manufacturing facility that produces any of the following:

- Equipment and/or technologies used to produce energy from the sun, wind, geothermal or "other" renewable resources
- Fuel cells, microturbines or energy-storage systems for use with electric or hybrid-electric motor vehicles
- Equipment used to refine or blend renewable fuels

- Equipment and/or technologies to produce energy-conservation technologies (including energy-conserving lighting technologies and smart grid technologies)*

Program Information: <http://www.energy.gov/recovery/48C.htm>

Energy-Efficient Appliance Tax Credit for Manufacturers

The Energy Policy Act of 2005 established tax credits for manufacturers of high-efficiency residential clothes washers, refrigerators, and dishwashers produced in calendar years 2006 and 2007. The Energy Improvement and Extension Act of 2008 (H.R. 1424, Division B) extended the credits for additional years depending on the efficiency rating of the manufactured appliance. Manufacturers only receive these credits for the increase in production of qualifying appliances over a two-year rolling baseline, and only appliances produced in the United States are eligible.

Program Information:

http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=US42F&re=1&ee=1

State of Ohio Policy

House Bill 1 – Special Energy Improvement Projects

In July of 2009, Ohio House Bill 1 established the authority for local municipalities within Ohio to borrow money to pay for solar photovoltaics and solar thermal energy projects that would eventually be owned by the individual property owners within the community. The bill requires the creation of Special Improvement Districts (SID) in the city, with signed consent of all participating property owners in the district. The bill allows the municipality to purchase and contract the installation of solar electric and solar thermal systems on all properties within the SID, and to collect



payment from the property owners through a property tax assessment for up to 25 years.

Property tax assessment financing has proved to be a successful financial model for homeowners in California and Colorado, and this has the potential to drive demand for solar photovoltaic and solar thermal systems within the state of Ohio; however, as of the time of writing, no municipality in Southwest Ohio has established special improvement districts.

Edison Technology Centers

The Ohio Department of Development operates seven “Edison Technology Centers” throughout the state providing a variety of product and process innovation and optimization services for technology-based businesses. TechSolve is the Cincinnati area Edison Center, and delivers Federal and State Manufacturing Small Business Assistance programs. TechSolve provides advanced manufacturing process and system services including productivity improvement training and machining technology assistance.

As a free consulting service, TechSolve provides assistance to small manufacturing companies in areas of management, human relations, marketing, sales, operations, and strategic planning. Additional consulting services cover advanced machining research and development covering new product testing and validation, parts cost reduction, and machining system optimization.

EMTEC, the Edison Materials Technology Center, is located in Dayton. This non-profit organization develops technology and business strategies, sponsors and manages collaborative technology projects and programs, and provides technology and business based assistance that facilitates the commercialization of new technology.

EMTEC’s focus is on products and technologies in Advanced Materials, Advanced Energy, and Instruments, Controls, and Electronics.

Ohio Schools Facility Commission – LEED Silver Resolution

On September 27, 2007, the Ohio School Facilities Commission (OSFC) passed Resolution #07-124, approving the incorporation of energy efficiency and sustainable design features into all future and some previously approved school projects. All K-12 public school projects approved by the OSFC are required to meet a minimum of LEED for Schools Silver certification, with strong encouragement to achieve the Gold level. There is additional emphasis on maximizing Energy & Atmosphere credits. The resolution directs OSFC to cover all LEED registration and certification fees and to provide a supplemental allowance.

Ohio Air Quality Development Authority Tax Incentives

This program allows for a 100% exemption from property tax, portions of franchise tax, and possibly sales or use taxes for purchasing facilities that are used for collection, storage, treatment, processing, or final disposal of solid waste resulting from an air pollution control process. It can also apply to projects that modify or replace property, processes, devices, equipment, or structures that remove air pollution and contaminants, any energy efficiency project, or any project that uses renewable or biomass resources.

Renewable Energy Portfolio Standard

Ohio is one of 29 states that have Renewable Energy Portfolio Standards for its utility providers. According to the Renewable Portfolio Standard in Ohio, all retail electricity distribution utilities and service companies must provide 25% of their retail electricity supply from alternative energy resources by 2025. At minimum, 12.5% of that supply must be generated from renewable energy resources. Additionally, 50% of the renewable energy sources

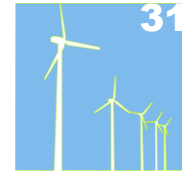


must be generated in the state. Utilities that fail to meet the benchmarked goals between 2009 and 2025 will be subject to financial penalties that could be paid into the Ohio Department of Development's Advanced Energy Fund.

Ohio Public Benefits Fund

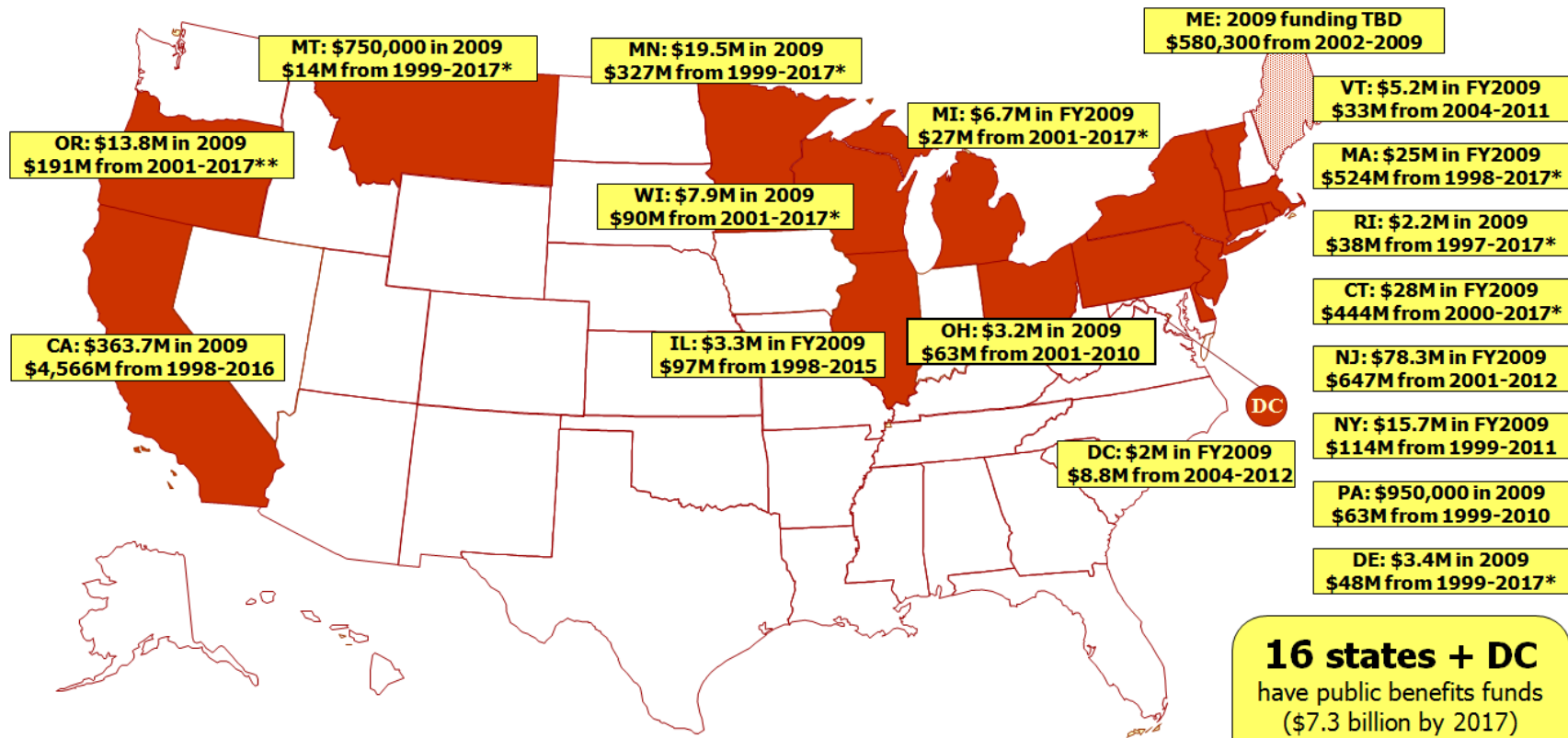
Public Benefits Funds are a common model used in the United States to generate funding for renewable energy and energy efficiency grant programs state-wide. Typically, these funds are collected by the publicly regulated utility companies in a given state through rate payer fees.

Ohio is one of only 16 states plus the District of Columbia that has a public benefit fund dedicated to renewable energy and energy efficiency programs. The Public Benefit Fund in Ohio is key to generating funding for programs like the Department of Development's Advanced Energy Grants; however, there is clearly more that could be accomplished with a more generous fund. See the recommendations section of this report for further discussion of methods to raise additional funding through the Ohio Public Benefits Fund.



Public Benefits Funds for Renewables

www.dsireusa.org/ / May 2009 (estimated funding)



16 states + DC
 have public benefits funds
 (\$7.3 billion by 2017)
ME has a voluntary public benefits fund

State PBF
 State PBF supported by voluntary contributions

* Fund does not have a specified expiration date
 ** The Oregon Energy Trust is scheduled to expire in 2025



Hamilton County Policy

Cool Counties Initiative

Hamilton County Commissioners signed the Cool Counties Initiative developed by the Sierra Club, King County, Washington, and Fairfax County, Virginia. The goal of the Cool Counties Initiative is for local counties throughout the nation to lead the way in reducing carbon emissions. As a signatory to the Cool Counties Declaration, Hamilton County has committed to a greenhouse gas reduction goal of 80% below current levels by 2050 (2% reduction per year).

As a first step of the process, Hamilton County Commissioners convened the Hamilton County Climate Initiative through a series of meetings with the multiple jurisdictions, towns, villages, and cities within Hamilton County. The meetings served as a data gathering series to collect carbon reduction tools from throughout Hamilton County with an expectation that each jurisdiction within the county will be able to develop a customized Climate Action Plan using the tools provided.

City of Cincinnati Policy

Mayor's Climate Commitment – Green Cincinnati Plan

The Green Cincinnati Plan (formerly Climate Protection Action Plan), is an initiative managed by the City Office of Environmental Quality. As part of Mayor Mallory's Green Cincinnati Initiative, it is a roadmap for how Cincinnati can reduce its greenhouse gas emissions and meet the Mayor's Climate Commitment.

The Green Cincinnati Plan was developed with community stakeholder input, establishes green house gas emission reduction

goals of 8% within 4 years, 40% within 20 years, and 84% by 2050 (42 years). It quantifies annual contributions to global climate change at 8.5 million tons of carbon dioxide equivalent (CO₂e) for the City of Cincinnati, and 432,000 tons of CO₂e for Cincinnati City Government. In addition to the measurement and reduction goals, the plan outlines over 80 specific recommendations for how to reduce contributions to global climate change.

LEED-CRA Tax Abatement

On December 12, 2007, the Cincinnati City Council adopted Ordinance 446-2007, amending Ordinance 182-2007 and providing an automatic 100% real property tax exemption of the assessed property value for newly-constructed or rehabilitated commercial or residential properties that earn a minimum of LEED Certification. Buildings that earn LEED Certified, Silver or Gold can receive a real property tax abatement up to \$500,000, with no limit for LEED Platinum buildings. The property tax exemption period is 15 years for new residential, commercial, or industrial buildings; 12 years for renovated commercial and industrial buildings and renovated residential buildings with 4 or more units; and 10 years for renovated residential buildings with 1-3 units.

LEED Building Policy

On September 20, 2006, the Cincinnati City Council approved a motion requiring that all new municipal buildings earn LEED Certification. The motion also requires that existing municipal buildings be renovated following LEED guidelines.

CPS Sustainable Building Policy

On September 10, 2007, the Cincinnati Board of Education resolved to adopt "Green Guidelines" for its future public school projects. Pursuant to this resolution, all new Cincinnati public schools will strive for LEED Silver, requiring a minimum of four



schools to meet LEED Silver and one additional school to achieve either LEED Gold or LEED Platinum. The resolution addresses most Segment 2 and all Segment 3 schools. The segments are part of a schedule set forth in the Board's Facilities Master Plan that has already addressed the needs of Segment 1 schools and some Segment 2 schools. All Schedule 3 schools that are to be rehabilitated will strive for LEED Certified, while higher performance is encouraged.

The resolution also requires all certified schools to make readily available graphic information on sustainable features for educational purposes and also encourages the integration of sustainable design principles into the curriculum for the entire school district.

Environmental Justice Ordinance

The city of Cincinnati became the first city in the nation to pass an Environmental Justice Ordinance. By revision to the Cincinnati Municipal Code, the Environmental Justice clause creates a special review and permitting process for proposed projects that are known pollutant sources, and requires proof that the emissions do not pose a cumulative adverse impact on the health or environment of the surrounding community.

Response to passage of the ordinance has been mixed. While most everyone applauds the intent of the ordinance to more equitably protect the health and environment of all neighborhoods in the city equally, most criticism of the ordinance is focused around the increased time and 'red-tape' burden placed on companies seeking to expand or relocate their manufacturing process to the city.

For this policy to be fully effective without damaging job creation efforts, extensive outreach, support, and education will need to be provided to businesses that will be affected by this ordinance.

Training Pathways

Training pathways into green jobs in the Cincinnati region are many, varied, and relatively uncoordinated, although several attempts have been made, and work is under way, to consolidate and align these programs.

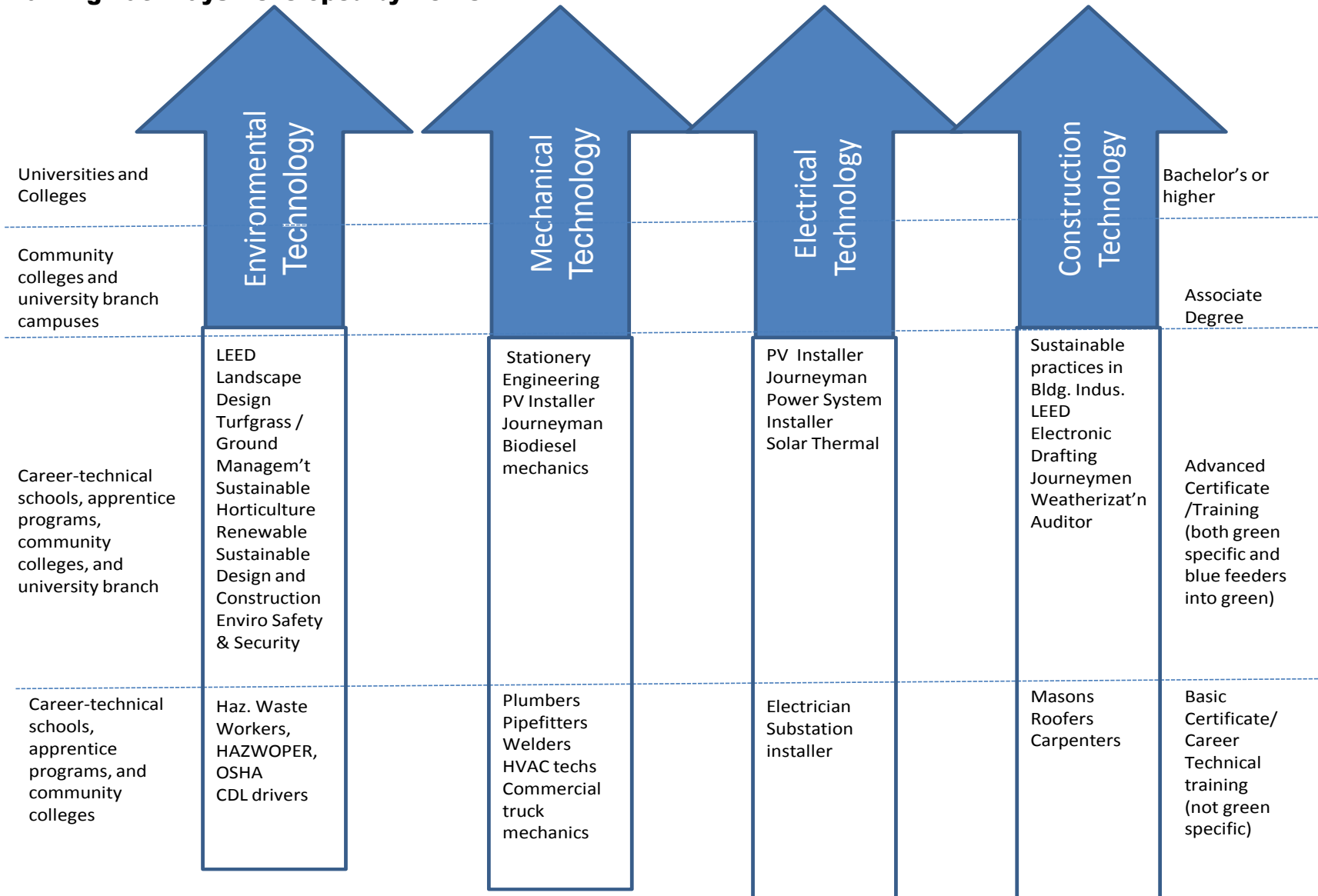
Through the Ohio Department of Development Region 5 office, a collaborative of universities, technical schools, workforce development boards, and other adult training centers convened the "Region 5 Workforce Collaborative (R5WC)". The R5WC convened in June of 2009 to collect and assemble a "Stackable Certificate and Asset Map" for entry into green markets.

The result is a database of all 78 certificate and diploma programs offered in greater Cincinnati that relate to green construction, who offers them, and contact information for each program. The group also documented a potential alignment of these programs across 4 career tracks, all within construction industries, resulting in the career pathway diagram seen here. This is a shining example of a first step to alignment of programs to allow for a pathway into green industries within construction in the region.

This effort needs to be repeated for each industry, and coordinated with economic development strategies to ensure that when individuals graduate from these programs that there are employers with jobs ready for them.



Training Pathways Developed by R5WC



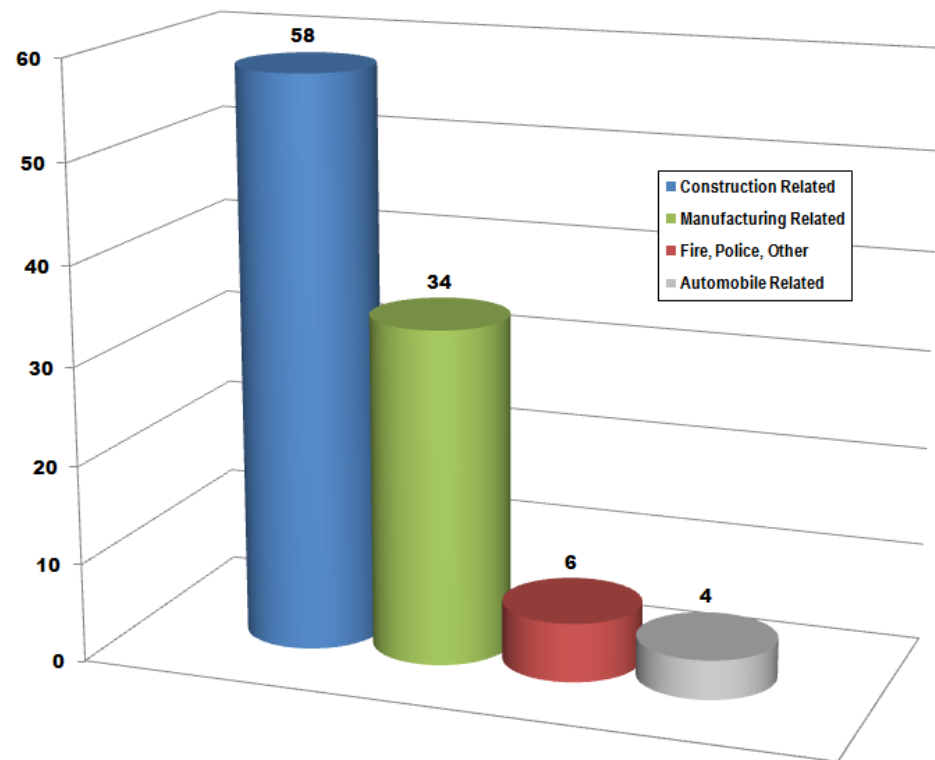
In addition to the certificate and diploma programs of the local community colleges and universities, according to the Ohio Department of Job and Family Services, there are over 102 registered apprenticeship programs in greater Cincinnati. 6 of those programs are related to fire, police, or youth services, and 58 of them are construction trade related. Out of the 102, only 34 are focused on manufacturing trades, representing only maintenance electricians, machinists, tool and die makers, and sheet metal working. Of all potential apprenticeship programs for manufacturing, only 6 which deal with maintenance electricians have any significant 'green job' skill shifts. Three other programs for electrical line erectors and maintenance workers would also need additional green skills training.

In other words, out of 102 apprenticeship programs in greater Cincinnati, there are 9 programs which would need to modify their training to include new knowledge, skills, or abilities to prepare an apprentice for a 'green job'.

There is a significant need to introduce registered apprenticeship programs for the potential green job occupations that are lacking in the region such as coil winders, fiberglass laminators, and semiconductor workers.

Registered Apprenticeship Programs

Data by ODJFS, Graphic by emersion DESIGN





Finally, as discussed earlier, The Greater Cincinnati Workforce Network is focused on supporting Health Care, Construction, and Advanced Manufacturing sectors by aligning workforce training programs with employer demand. The work that is being accomplished by the Greater Cincinnati Workforce Network (GCWN) should continue to be supported and integrated with the proposed Green Jobs Council; however, the scope of their focus should be expanded to include all green industry sectors.

Additionally, by integrating the GCWN with the proposed Green Jobs Council, the stakeholder group can be widened to include government and economic development representatives. This will allow the group to better align the training programs to current employment demand and coordinate with future market demand and economic development strategies.



Research Findings and Conclusions

From this context of existing programs, incentives, training programs, and workforce data, there are five key findings which will set the stage for the proposals and recommendations of this report. While not all of the research findings are negative, effort has been made to identify at least one recommendation that will address the research finding, either by supporting the positive attributes of the finding, or addressing the negative attributes. These recommendations will be discussed in detail in the next chapter of the report.

Key Finding #1: No Clear Definition of “Green Jobs”

The fact that there is not a single accepted definition of green jobs within our region is not surprising. Throughout the country and the world, there are varying definitions of what a green job really is. Additionally, the methods used to classify jobs and determine whether they meet the specific adopted definition of green jobs varies from report to report, and policy to policy.

This difficulty results from the fact that any job could be a green job. Green Jobs range from skilled labor, to consulting and policy experts. They should produce green products or services while paying full-time living wages (and prevailing wages in the construction sector) with affordable quality health care and retirement benefits for work completed in a safe working environment. This report proposes a specific definition of ‘Green Job’, and proposes metrics by which to verify if a job meets that definition. A major task moving forward for the region is to collectively define what jobs will qualify for incentives, and promotion as ‘Green’.

Key Finding #2: There is a Lack of Coordinated Focus on Green Jobs

In greater Cincinnati, discussion and support of green jobs is at once everywhere and nowhere. There are efforts to support green jobs in the non-profit sector, in government policy, and in workforce training. However, during the course of research for this report, it became clear that there is not a single organization, entity, or coalition that is recognized within the community as the resource, or coordinator of efforts.

In several states throughout the country, there are specific government offices, entities, or coalitions focused on supporting, promoting, and generating green jobs. In these states, these Green Collar Jobs Councils are chaired by senators and governors. They have been created as broad coalitions and initiatives of the administrations to focus, collect, and convene as a single entity that is responsible for coordinating the myriad number of green jobs efforts throughout their region. This is not true for greater Cincinnati. While many of the local policies and priorities clearly support green jobs, and while there are many organizations that are working to promote green jobs, there is not currently a venue through which their efforts can be coordinated.

Key Finding #3: Manufacturing in Greater Cincinnati can Remain a Vital Economic Sector

As outlined, there are many indicators that manufacturing can remain a vital part of the Ohio economic base. There has been a steady increase in productivity and value of goods produced in Ohio, there is a strong workforce of skilled manufacturing labor on which to build, and there are



many communities throughout Ohio that have seen an increase in manufacturing jobs. In addition to the indicators that manufacturing as a whole can continue to succeed in Ohio, the strong skill base of Ohio is ideal for many of the projected growth industries.

**Key Finding #4:
Existing Workforce and Skills in Greater Cincinnati
are Vital for Green Industries**

As indicated above, the skill set of the workforce in greater Cincinnati aligns very well with the skills and occupations needed for many of the new green industries. Whether it is in green construction, green cars, renewable energy, green chemistry, or rail transportation, there is a prominent skill base that can support each of these industries.

**Key Finding #5:
Policy, Incentives, and Training Exist, but are not
Coordinated to Work Together**

It is clear from the huge amount of information available on programs, incentives, policies, and training programs that there is tremendous work being done in every aspect of the region to promote and support green jobs. At all levels of government, non-profits, unions, and education centers are all working on their own programs. However, they have not yet been coordinated to work together in a broader context with an economic development strategy and policy framework.

For example, GO Cincinnati and Agenda 360 have identified chemical manufacturing as key growth industries for the region, but to date, there has been little work on the training side to focus on the skills and resources needed to transition chemical manufacturing to green jobs.



Key Recommendations and Proposals

For each of the Key Research Findings, effort has been made to identify recommendations in response to those findings. Each recommendation will be discussed in detail with strategies identified containing policy examples, program models, and resources for implementation.

Key Recommendation #1: Define Green Jobs

This report proposes the following definition for green jobs: Green Jobs are jobs which produce green products or services while paying full-time living wages (and prevailing wages in the construction sector) with affordable quality health care and retirement benefits for work completed in a safe working environment.

Key Recommendation #2: Create a Green Jobs Council

The formation of a local Green Jobs Council is perhaps the most important recommendation of this report. The time and effort of this report's steering committee, plus the research work that has been completed thus far, runs the risk of sitting un-used without a consistent effort that a Green Jobs Council could provide. In addition it could provide continued momentum for implementation of the other recommendations.

An effective Green Jobs Council will be a broad coalition of parties, and include community organizations, unions, businesses, workforce development, k-12 schools, community colleges, and universities. Unions and environmental groups will have an integral and equal role in the Green

Jobs Council. The Cincinnati Green Jobs Council could provide the guidance, coordination, and provide the venue for all organizations that are interested in promoting green jobs to collaborate and coordinate their efforts. The Green Jobs council will also advocate for green job policies and programs at the state and local levels. For a long-term predictable and reliable commitment to green development, unions must have an integral role in representing the workforce.

Strategy: Sign the Local Government Green Jobs Pledge

The non-profit organizations Green For All, the Apollo Alliance, the Center for American Progress, and ICLEI – Local Governments for Sustainability, developed the Green Jobs Pledge. In June of 2008, the U.S. Conference of Mayors passed a resolution to support the pledge, which is intended for local government leaders to commit to a “Focus on green-collar jobs as a central strategy for advancing environmental, economic, and climate protection goals.” To date, the current signatories include only 20 municipalities, including Toledo, Ohio. The City of Cincinnati and Hamilton County should sign the Green Jobs Pledge, and convene a Green-Collar Jobs Council.

The Cincinnati Green Jobs Council should start by adopting a community wide definition of Green Jobs, then identify goals and opportunities for green job creation and develop a plan of action to align job creation and job training for Cincinnati and Hamilton County using this report as a starting point for their work.



Strategy: Develop a Green Business Definition Framework

A key role of the Green Jobs Council should include developing a framework to identify and measure green jobs and green businesses. The framework outlined in this report is just a beginning, and would require additional input and buy-in from all stakeholders in order to be an effective definition upon which to structure incentives.

Key Recommendation #3: Support Existing Companies Going Green

As became clear during the research of this report, supporting the existing industry in the region in their efforts to transition to green jobs is perhaps the only realistic strategy for significantly shifting the region's economy to a green collar one. If there were enough new green manufacturing companies that relocated to the region overnight that populated every currently vacant industrial site, they would still only represent a tiny fraction of the total manufacturing base in greater Cincinnati. The only real strategy to shift the entire market of greater Cincinnati is to focus on greening existing business.

By developing policies that support existing industry and existing jobs going green, the region will not only create green jobs out of grey ones, but it will save existing jobs, and reinforce the existing manufacturing skills, knowledge, and ability of the greater Cincinnati workforce. This strategy builds on existing strengths, and reinforces a unique identity and trait of the region.

The strategies presented here are intended to address the major perceived roadblocks for an existing company to "go green" including lack of awareness of options, or strategies, lack of necessary workforce skills, lack of access to customers, or demand. Policies that deal with capital funding

for projects and facility improvements should also be available to assist existing businesses, and these are discussed in Key Recommendation #5.

Strategy: Assist Companies with Assessment of Green Opportunity

As discussed in the Existing Policy section of this report, the State of Ohio Department of Development currently supports the operation of several "Edison Technology Centers". These non-profits serve as manufacturing business incubators and start-up consultants. Hamilton County and the City of Cincinnati support similar business incubators that provide entrepreneurial training, administrative support services, and other business development consulting.

In addition to business consulting, the services offered at these centers could be expanded to include Green Assessment Services ranging from energy audits to sustainability strategy consulting including product and process certification assistance. This service would allow existing established companies to assess their current state, and chart a roadmap for a transition to green jobs, whether that means demonstrating compliance with Green Business or Green Job definitions, or assistance navigating the myriad grants, loans, and incentives that are available through different entities.

Strategy: Provide Pre-Certification of Component Manufacturers

Providing pre-certification services for component manufacturers of turbine, solar panel, electric cars, and other technologies would provide an opportunity for small manufacturers to gain recognition from large Original Equipment Manufacturers (or OEMs) such as GE, Ford, GM, etc. These pre-certification services could be supported by the State of Ohio, City, or County through the existing Edison Center or business incubator models, and could be an additional consulting service that is offered as part of the Green Opportunity Assessment.



Strategy: Provide Networks for Component Manufacturers

The Great Lakes Wind Network (<http://www.glwn.org>) is a coalition of wind component manufacturers that provides access and exposure for component manufacturers to OEM's for wind turbines. The Great Lakes Wind Network was developed with an Ohio Department of Energy research grant in 2008. Similar programs should be developed for each of the green industry markets, to link smaller manufacturers with large companies. This strategy is critical in light of the EMSI research indicating that most of the growing manufacturing companies in Ohio are smaller companies.

Strategy: Provide Workforce Training for Existing Workers

The Ohio Workforce Guarantee Program is a statewide grant program that will reimburse employers for the cost of workforce training for employees that receive fair pay, and are trained in target areas. This program could be duplicated at the city and county level to enhance and supplement the state level program, with a focus on the training needed to shift from traditional job skills to green job skills.

Strategy: Ensure Policies Reward Shades of Green Appropriately

It is important to recognize varying "shades of green" when implementing new incentives. Many existing companies are not prepared to commit entirely to a complete sustainability over-haul of their operations, facilities, or products, but are interested in starting the process.

A great way to reward companies for taking their first steps at being 'green-er', while at the same time incentivizing them to continue to pursue higher levels of performance is to utilize a graduated system of incentives. Under a "shades of green" system, companies that have pursued the most rigorous and objective green jobs efforts should be recognized and rewarded at the highest level available. While a company that has just begun the

process of going green should not get the same level, they should receive an incentive that is generous enough to encourage continued investigation of green projects.

Under this system, the efforts of a Green Jobs Council would be imperative in helping to establish what thresholds are appropriate, the number of thresholds, and what the objective criteria are for determining the achievement of successful green efforts.

Key Recommendation #4: Develop Funding Models for Additional Investment

Clearly, any additional incentive, investment, program, or grant will require additional funding to support it. Especially with city, county, state, and federal budgets in extremely high deficit, it is foolish to believe that even the staunchest green job supporter could easily implement any new spending items to promote green jobs. The strategies for generating funds range from large scale national investment banks, to feebates that can easily be set up in cities or counties.

Regardless of the other strategies that are pursued, the need to establish effective, financially sustainable models for generating funding to complete these projects is critical to the success of the green jobs movement.

Strategy: Create a National Infrastructure Investment Bank

National infrastructure investment banks have been proposed by President Obama, and the concept was recently introduced in the US House of Representatives via legislation from Congresswoman Rosa DeLauro of Connecticut.

The National Infrastructure Development Bank Act would fund and create a bank that would direct public and private dollars toward



infrastructure projects of national or regional significance including upgrading of the nations electrical grid, improved rail transportation, and increased implementation of renewable energy generation.

In Germany, the KfW Bankengruppe is an infrastructure bank of this kind that is partially owned by the German federal government, and partially owned by the states of Germany. KfW has been operating for more than 60 years, and is currently one of the world's largest investors in renewable energy.

The key to the success of the nationally owned investment bank is that they are not taxed, and they do not distribute profits. In Germany, it has allowed KfW to borrow money extremely cheaply, and in turn loan more cheaply than a commercial bank, and has resulted in a total financing volume of 87 billion EUR in 2007.

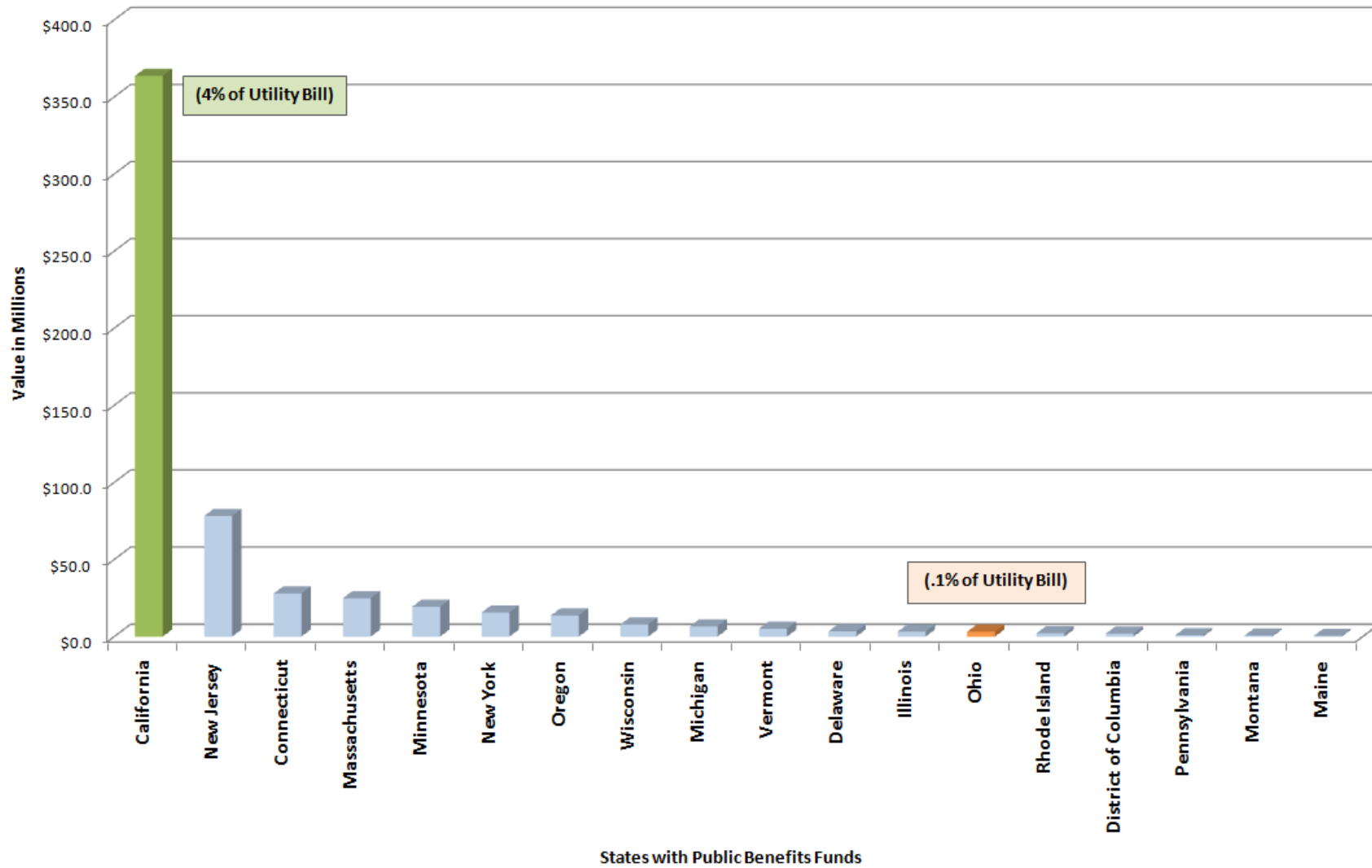
Strategy: Increase Ohio Public Benefits Fund Contributions

According the American council for an Energy Efficient Economy (ACEEE), the rate-payers of Ohio pay approximately .1% of their utility bill into the Public Benefits Fund managed by the Public Utilities Commission of Ohio. This generated an over-all Public Benefits Fund of approximately \$3.2 million in 2009, according to the Database of State Incentives for Renewables and Efficiency. The same year, the California Public Benefits Fund had a value of over \$363 million in 2009. According to the California Public Utility Commission, California rate-payers pay approximately 4% of their utility bill into the fund.

Clearly, the ability of the Public Benefits Fund to have a significant impact on the economy of Ohio towards a green economy is severely limited by the total amount available in the fund. In context, although the population of Ohio is well above all but 4 other states with Public Benefits Funds, the value of the Ohio fund is almost \$30 M below the average fund. Because the funds are supplied by all utility customers in the state, the amount that each rate payer is charged should be increased to support further investment and raise additional funding for these programs.



Public Benefit Funds (value in FY 2009)





Strategy: Implement Green Car Feebate Programs

Feebate programs are extremely simple concepts, and much more complicated in practice. In concept, a FEE is charged on items, in this case inefficient or high polluting vehicles, and a re-BATE is offered for high efficiency or low emitting vehicles. In theory, the program can be established to be revenue neutral or positive, and in many cases, *all* purchases are charged the fee, and the fee is simply waived for purchase of items that are preferred. In this model, the program should generate funds for investment.

A Green Car Feebate could be established at the State level to incentivize the purchase of fuel efficient vehicles, and discourage the purchase of less efficient ones. The feebate structure can be arranged in several ways; all cars registered in the state pay an additional “fee”, unless the vehicle is on the ACEEE Green Car list with a score of 40 or above, or a ranking of “Superior”, for example, in which case the fee is waived.

Feebates could also be established and charged at the point of purchase of a vehicle, and they can be determined by MPG, or total greenhouse gas emissions, or even triggered by being American made.

This method creates funding that can then be used to invest in development of fuel efficient vehicles, or create incentives for the purchase of new fuel efficient vehicles. Strategies for determining the balance point to allow this program to be revenue neutral or positive are available through the Rocky Mountain Institutes report: *Feebates - A Legislative Option to Encourage Continuous Improvements to Automobile Efficiency*.

France implemented a “Bonus/Malus” Green Car Feebate program in December of 2007; however, there are no examples of this type of program in the US. A feebate program called the California Clean Car Discount Act was introduced in 2008 into the California Assembly; however, it failed to pass out of committee.

Strategy: Implement Green Building Feebate Programs

A Green Building Feebate program could operate at the city or county level very effectively because fees are typically collected at city or county building departments during the permit application process.

Arlington County, Virginia has a feebate program in place to incentivize the construction of LEED Certified green buildings. All buildings are charged a ‘Green Building Fee’ in addition to building permit and site approval fees, unless the project can prove that the project has been certified as green by the U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED) Rating System. Projects that achieve LEED Certification receive a waiver for this fee. This program generates funds that are then used to implement education and green building grant and loan programs throughout the county.

This strategy could easily be implemented in Southwest Ohio by any city or county that collects building, or site permits.



Key Recommendation #5: Add Green Strings to Existing Incentives

The city and county offices of Economic Development, and the Ohio Department of Development, have a myriad number of incentives and packages that are offered to businesses that are relocating, expanding, or looking to move. An easy strategy to implement that requires no additional funding is to simply “add green strings” to these existing incentive packages.

A perfect example of this is the LEED Property Tax Abatement in the city of Cincinnati. The tax abatement existed previously and was available to developments that could demonstrate a significant community benefit and a direct financial need. Through an arduous process, property tax could be abated for specific project following a review with city council and a determination of the level of need. When the legislation authorizing the tax abatement was up for renewal, the city simply modified the abatement to include an automatic tax abatement for any project that achieves LEED Certification, thereby simplifying the tax abatement process, and adding ‘green strings’ to an existing program, effectively making it revenue neutral.

This strategy should be pursued on all existing incentives, whether it is a revision, replacement, or simply an alternative (easier) path to achieve the same incentive. By simply revising existing programs to utilize green job definitions and thresholds for investment, or green business definitions to determine eligibility for higher thresholds of incentive, by linking ‘green strings’ to an existing program, the majority of the legislative and administrative work is complete, and no additional funding is required to implement them.

Key Recommendation #6: Add, Enhance, and Align Policies for Green Jobs

In addition to new policies, a successful green jobs initiative requires an overt effort to align policies and programs in support of green jobs. Without a consistent and strong effort, many of the initiatives that would help businesses “go green”, or attract new green businesses will fall flat.

After the implementation of the previous recommendations, it is time to add new policies, and enhance or align existing ones to focus on green jobs. Many of the strategies listed below simply increase demand for more green products. Some simply create additional indicators so that the region understands the unique needs of green business and a green workforce, and that the region is ready to support them. While others create necessary tools to assist businesses in navigating the municipal maze of policies and incentives.

Strategy: Green Existing Buildings

By greening existing buildings, city and county governments will lower their energy costs and create demand for energy efficient products like energy star windows and insulation, while at the same time creating and supporting green construction jobs. The city of Cincinnati and Hamilton County are both currently utilizing performance contract measures to improve the energy efficiency of municipally owned buildings, paid for out of the energy savings. Programs that align with this report’s definition of “green jobs” are supported. Examples for helping the private sector participate in similar programs are demonstrated by the Center on Wisconsin Strategy (COWS) and the Greater Cincinnati Energy Alliance (GCEA). The COWS Milwaukee Energy Efficiency (Me2) program allows small property owners and even renters to participate in energy efficiency upgrades paid for by the savings through their energy bill. A similar program has been launched locally through



the GCEA. The GCEA should continue to be supported by the City of Cincinnati and Hamilton County to assist private residents, non-profits, and businesses in taking advantage of the energy efficiency savings, thus driving demand for energy star windows, insulation, and skilled trades in the region.

Strategy: Create Special Energy Improvement Districts

The State of Ohio recently passed legislation authorizing municipalities to create Special Energy Improvement Districts. These districts are tools that allow municipalities to take advantage of bulk purchasing power to implement renewable energy installations on several properties at once, and then levy the costs of the improvements on the property taxes to pay back the cost of the projects.

Implementation of this program would require significant funding from the municipality, but several of the programs discussed in recommendation number two could be earmarked specifically for this purpose.

This system allows homeowners to implement renewable energy projects, and pay back the municipality for the cost of these installations over time, allowing the energy savings to be realized by the owner. An additional benefit to this system lies in the fact that it is not a direct loan to the owner; rather, it stays with the property through taxes, so if the property is sold, the new owner will continue to pay the cost of the improvements back, and will also continue to see a net savings.

Municipalities should take advantage of the new authority given to them, and begin gathering information from business and home owners that are interested in participating in Special Energy Improvement Districts.

The Milwaukee Energy Efficiency (Me2) program is an example of this type of program.

Strategy: Establish and Implement a Carbon Reduction Goal

The City of Cincinnati has established a carbon reduction goal in the Green Cincinnati Plan, and this goal should be actively pursued and continue to be supported. By implementing a carbon reduction goal, the city will inherently be creating green jobs by improving energy efficiency of existing buildings, reducing waste, and planning for strategies that reduce traffic, and promote rail transportation. All municipalities in the region should also establish a carbon reduction goal and follow through with an action plan to implement the reductions.

Strategy: Establish Revolving Loan Funds Rather than Grants

When tax-payer money is distributed with no expectation of repayment, it carries with it the same connotations as hand-outs, or even worse, bail-outs. Low-to-no interest loans however, stand no risk of being mistaken as a government handout or subsidy.

In addition to perhaps being more politically palatable, a loan program if set up properly could become self-supporting, requiring little to no additional tax-payer investment to maintain the program. Where feasible, revolving loan funds utilizing low-to-no interest loans should be implemented to ensure that programs remain financially sustainable while they are working to improve our environmental sustainability.

Strategy: Support Transit-Oriented-Development

Transit oriented development is a development strategy that emphasizes dense, walkable neighborhoods, located along mass-transit lines and hubs incorporating multiple transportation options including bus, rail, car, and bicycle.



The economic development strategies outlined by Agenda 360 and GO Cincinnati both emphasize transit oriented development, and specifically recommend implementing the proposed streetcar system. According to the Streetcar Feasibility study issued by HDR, they predict the streetcar would require up to \$2.75 million in operating and maintenance costs each year, supporting well-paying rail worker green jobs in the region.

The promotion of transit oriented development would not only create and support jobs, but provides additional access to jobs for everyone by emphasizing public transportation options and walkability. This development strategy is essential for the transition to a more sustainable economy.

Strategy: Create a Green Business Development Officer

With the myriad of existing grants, loans, incentives, policies, and legislation already in place, in addition to the strategy proposals outlined here, efforts need to be made to assist companies in understanding the multiple pathways to green that are available to them.

The creation of a Green Business Development Officer in the city, county, or even the state level, will provide a single point of contact for companies that want to head down a path towards greening their jobs. This position will also ensure that the emphasis on providing green jobs is clear for relocating businesses during their negotiations and discussions with the offices of economic development.

The City of Chicago has a clear, single point of contact to understand all of the city's environmental policies, incentives, and legislation through their Department of the Environment. By consolidating all of these efforts with the economic development

efforts, Cincinnati will be able to integrate environmental policy and green job creation.

Strategy: ODOT – Wind Component Oversized Load Permit

Ohio's geographic location made it an ideal location to manufacture goods during the industrial revolution because of the distribution options available by the Ohio River. This is true today more than ever before for the 'Green' industrial revolution. Ohio's distribution options of the river, rails, highways, the Great Lake, and air all make Ohio's distribution system one of the most utilized in the country.

Wind turbine towers and blades require significant logistical coordination to transport. According to the American Wind Energy Association, wind turbine components can weigh as much as 90 tons, and extend up to 200 feet in length.

A key issue has developed around wind component transport in some communities due to safety conditions, and many companies are looking for distribution centers that can take advantage of barge and rail transport.

Because not all of the components will be able to be distributed by rail or barge, and some will need to be moved by truck, the creation of a special ODOT Permit for Wind Energy Components would go a long way to demonstrating to large OEM's that the state of Ohio understands the concerns of the industry. Currently, ODOT has special permits for farm equipment, construction equipment, boats, and manufactured buildings. Developing an additional form specific to wind components would go a long way to further the industry in the state.



Strategy: Develop Standards for Green Contractors

The Green Jobs Council will develop minimum standards for green contractors. With this process customers can be confident that all participating employers provide good family-supporting jobs and meet environmental standards and their employees have requisite skills. Criteria for approved employers include but are not limited to:

- Pay family supporting wages, provide affordable health care, and retirement benefits
- That construction residential contractors and their entire workforce have national third party certification certified through the Building Performance Institute (BPI) or a similar body that meets all of DOE core competencies
- That all contractors (residential and commercial) participate in a high quality apprenticeship programs registered with the state of Ohio and/or the U.S. Department of Labor with an established record of successfully training, graduating, apprentices in the construction industry.
- That contractors demonstrate a history of compliance with federal and state wage and hour laws
- That residential construction contractors utilize a safety-trained workforce in which all on-site workers have completed an OSHA 10-hour safety course and an Environmental Hazard Awareness Course through a qualified training program.
- That residential construction contractors participate in an independent energy audit upon job completion, to make a quality assurance check.

Strategy: Promote Community Benefits Agreements (CBAs)

Properly crafted Community Benefits Agreements (CBAs) and Project Labor Agreements (PLAs) will dramatically promote the

development of green jobs in our region. BGA will promote CBAs and or PLAs on public as well as private developments. Standards on CBAs and PLAs are enforced by the owner or the developer and should include but not be limited to: Environmental Standards, Labor Standards, livable wages, and hiring and training of local residents.



**Appendix A:
Committee Meeting Agendas and Notes**



STEERING COMMITTEE MEETING #1

LOCATION: Hamilton County Business Center

1776 Mentor Avenue, Conference Room 161

JULY 14, 2009

9:00-10:30 AM

Meeting Agenda

9:00 – 9:15 Introductions

9:15 – 9:25 Review Project Goals

1. Identification of existing 'green' markets in Cincinnati
2. Identification of potential 'green' markets in Cincinnati
3. Identification of barriers to 'green' jobs and businesses in Cincinnati
4. Identification of incentives and policies to attract 'green' jobs and businesses to Cincinnati

9:25 – 9:35 Review Process and Timeline

1. Monthly meetings of Steering Committee – review schedule and location
2. 3 meetings of the Green Manufacturing Development Team
3. Presentation of Draft and Final Report

9:35 – 10:15 Set Boundaries and Definitions

- Geographical Boundaries
- 'Green' Market
- 'Green' Job
- 'Green' Business

10:15 - 10:25 Identify Green Manufacturing Development Team Members

Specific Individuals?
Resources?

10:25 - 10:30 Review of Next Meeting

GMDT Kick-off
Steering Committee Meeting #2



STEERING COMMITTEE MEETING #1

LOCATION: Hamilton County Business Center

1776 Mentor Avenue, Conference Room 161

JULY 14, 2009

9:00-10:30 AM

Meeting Minutes

[See attached Meeting sign-in sheet for attendance]

1) Discussion of Project Goals

- a) The following goals were discussed and agreed upon as the primary objectives for this study:
 - i) Identification of existing 'green' markets in the Cincinnati Region (jobs & businesses)
 - ii) Identification of potential 'green' markets in the Cincinnati Region
 - iii) Identification of barriers to 'green' jobs (as defined below) and 'green' businesses (as defined below) in the Cincinnati Region
 - iv) Identification of incentives and policies to attract and retain 'green' jobs and businesses to Cincinnati and Hamilton County
 - v) Identification of incentives, policies, and resources available to transition existing businesses to 'green' businesses
 - vi) Coordination of policy proposals and research with existing frameworks identified by Agenda 360 and the Go Cincinnati report

2) Discussion of Project Boundaries and Definitions

- a) The following definitions and boundaries were discussed and agreed upon:
 - i) Green - products, policies, services, operations, activities, and practices that contribute to sustainability

- ii) Sustainability – meeting the needs (of everyone, of all species) of today without compromising the ability of future generations (of everyone, of all species) to meet their own needs
- iii) Geographical Boundaries should be coordinated with previous research of Agenda360 and Go Cincinnati.
 - (1) Research boundaries should focus at a minimum on the 4 Ohio counties of Hamilton, Butler, Clermont, and Warren, and should not exclude the 7 bordering counties in Indiana and Kentucky
 - (2) Policy, incentive, and program recommendations should focus primarily on Cincinnati and Hamilton County
- b) Potential 'Green' Markets to be considered in this report include
 - i) Green Buildings/Retrofitting, specifically green building product manufacturing
 - ii) Renewable Energy
 - (1) Wind
 - (2) Solar
 - (3) Biofuels and Biomass
 - (4) Geothermal
 - iii) Mass Transit/Rail
 - iv) Clean Automobiles
 - v) Waste Management/Recycling
 - vi) Chemical Manufacturing



- c) The following definition of “Green Jobs” was discussed and agreed upon
 - i) Every job could be a green job (and every job could be greener)
 - ii) Can be entry-level, mid-level, or advanced-level jobs
 - iii) Employees receive a living wage for work completed
 - iv) Jobs provide opportunity for advancement (career track)
 - v) Can be “Root Occupations” requiring traditional training and/or skills applied for “green” outcomes
 - (1) Green product manufacturing
 - (2) Mass-transit/Rail maintenance and operation
 - (3) Waste Management/Recycling
 - vi) Can be “Derivative Occupations” requiring advanced training and/or skills for “green” outcomes
 - (1) Construction
 - (2) Energy (solar, wind, biomass, design and installation/maintenance)
 - (3) Design and Engineering (of buildings, products, vehicles, etc.)
 - (4) Policy, advocacy, and analysis
- d) Discussion of the definition of a ‘Green’ Business included the following;
 - i) Employers that support “Green Jobs”
 - ii) The Steering Committee agreed that an objective checklist is required to determine which businesses fit this description. A revised definition of ‘Green’ businesses with criteria for evaluation will be presented at the next Steering Committee meeting

3) Review Process and Timeline

- a) Location and time of meetings was agreed upon as acceptable
- b) Outline of process and timeline was agreed upon as acceptable

4) Green Manufacturing Development Team Members

- a) The group discussed appropriate individuals and organizations to serve on the Green Jobs + Manufacturing Task Force (See attached revised member list)

5) Review of Next Meeting

- a) Green Jobs + Manufacturing Task Force meeting #1 – July24,2009 (3:30 – 5:00 pm)
 - i) Location: Conference Room 160
 - ii) Steering Committee Members are welcome, but not required to attend
 - iii) Outline of Agenda – Overview of project, identify existing assets, understand existing markets
- b) Steering Committee Meeting #2 – August 7, 2009 (9:30 – 11:00 am)
 - i) Location: Conference Room 160
 - ii) Outline of Agenda – finalize green business definition, review GJMT results, review draft outline of report



STEERING COMMITTEE MEETING #2

LOCATION: Hamilton County Business Center
1776 Mentor Avenue, Conference Room 161

AUGUST 7, 2009

9:30-11:00 AM

Meeting Agenda

9:30 – 9:35 Introductions / Welcome

Next Steering Committee Meeting: September 11, 9:30
am – 11:00 am

9:35 – 9:45 Review Previous Meeting Notes

**9:45 – 9:55 Review proposed 'Green Business' Guidelines /
Definition**

9:55 – 10:25 Presentation of Existing Data

1. Manufacturing Jobs Data
2. Existing Green Jobs
3. Training programs and pathways
4. Existing Policy and Incentive Climate

10:25 - 10:45 Discuss Missing Data

1. Global / National Context
 - a. Global public investment in green markets
(*What are we up against?*)
 - b. Incentives / Policy of other regions (*Who can
we learn from?*)

- c. Workforce training strategies of other
regions (*Who can we learn from, and who
are we up against?*)
- d. Identification of current manufacturing
centers (*Who and where are the companies
we are up against, or should be recruiting?*)

2. Existing Green Jobs
3. Others?

10:45 - 11:00 Review of Next Meeting / Closing

1. Review and identify policy, training, and green jobs
growth challenges
2. Presentation of rough draft outline



STEERING COMMITTEE MEETING #3

LOCATION: Hamilton County Business Center

1776 Mentor Avenue, Conference Room 161

September 11, 2009

9:30-11:00 AM

Meeting Agenda

Meeting Objective: Review previous meetings, Identify Challenges/Opportunities for growth

9:30 – 9:35 Introductions / Welcome

Next Steering Committee Meeting: October 9, 9:30 am – 11:00 am, Room 161

9:35 – 9:45 Review Previous Meetings

1. Steering Committee Meeting #2
 - a. Definition of Green Jobs, Green Businesses, review of current jobs data
2. Green Jobs Task Force #2
 - a. Discussion of challenges, generation of green jobs database

9:45 – 10:00 Presentation of Existing Data

10:00 – 10:15 Review additional “Green Business” threshold definitions

1. Green Car Manufacturing = manufacturing cars or components for cars that achieve a green score above 40 in the American Council for an Energy-Efficient Economy (ACEEE), or receive a rating of “Superior” for their class.

2. What to do about loopholes?

- a. Vinyl Manufacturing – controversial both for workers health and environmental impact, but could be 14001 Certified
- b. Gorilla Glue – products would meet thresholds, but they have not certified their products

10:15 - 10:25 Review Outline of Final Report

10:25 - 10:55 Identify Challenges/Opportunities for Green Growth

1. Policy and Program Challenges to growth
 - a. Networks
 - b. Investment
 - i. Facilities
 - ii. Equipment
 - c. Overcoming upfront costs (clients and companies)
 - d. (Green) Energy Supply
 - e. Training requirements

10:55 - 11:00 Review of Next Meeting / Closing

3. Review policy and program suggestions
4. Review of Rough Draft



STEERING COMMITTEE MEETING #3

September 11, 2009

9:30-11:00 AM

Meeting Notes

Meeting Objective: Review previous meetings, Identify Challenges/Opportunities for growth

Attendance

- See attached sign-in sheet

Presentation of Existing Data

- Regional location trends – no clear regional shift
- EMSI Data indicates national growth in manufacturing; US DOL indicates declining industry in all states. Goal for the report is to identify ways to reverse the Ohio trend line, or at least find ways to slow it.
- Key question of urban to rural still remains – Ohio InSite database – 2,094 existing manufacturing locations in Hamilton County, only 41 available. Butler County = 851 Existing, 382 Available. Warren County = 493 Existing, 205 Available. Obvious where a new business would look for a new location.
- Question was raised about the size/acreage per available parcel as well – Go Cincinnati report identified ideal locations for new manufacturing sites within Hamilton County
- Also obvious that strategies should focus on helping existing manufacturing “go green”

Review additional “Green Business” threshold definitions

- Green Car Manufacturing = manufacturing cars or components for cars that achieve a green score above 40 in the American Council

for an Energy-Efficient Economy (ACEEE), or receive a rating of “Superior” for their class.

- What to do about loopholes?
 - Vinyl Manufacturing – controversial both for workers health and environmental impact, but could be 14001 Certified – still green company
 - Gorilla Glue – products would meet thresholds, but they have not certified their products - not a green company.
 - Question was posed – Is there a manufacturing process so onerous that it does not matter how many certifications the company receives, we would still consider it “Not Green”? – Group discussion concluded “no”. If a company meets the certifications, then at least they are better than they would have been without it.
 - Because some of the certifications on the list of “green businesses” are more respected within the environmental movement, the proposals should make distinction to maintain credibility
 - Different incentives for different “Shades of Green”
 - The more environmentally sound the certification, the more incentives are available
 - Additional distinction could be made between incentives and policies given for Green Company Policies/Operations, and Green Products



- Effort should be directed at helping existing companies move from one shade of green to the next – help green existing jobs

Identify Challenges/Opportunities for Green Growth

- Policy and Program Challenges to growth – two tracks
 - New Business
 - Existing Business
- See attached diagram for needs/tools matrix for new businesses
 - Additional discussion not captured in the matrix:
 - Need to get the funds to start many of the new programs
 - German Development Bank – Low interest loans
 - Need to develop a Green Manufacturing Council
 - On-going, continue this work, push for adoption of policy
 - Ensure representation from business, labor, government, and NGO
 - Some incentives will be more important for some industries, but not critical for others – for example, transportation is key to wind component manufacturing, but not necessarily for solar. Consider targeted industry needs.
- Need to develop a needs/tools matrix for existing businesses

Review of Next Meeting / Closing

- Next meeting: October 9, 9:30 – 11:00 @ emersion DESIGN – 1775 Mentor Avenue, Suite 202
- Review policy and program suggestions

GREEN JOBS TASK FORCE MEETING #1

LOCATION: Hamilton County Business Center
1776 Mentor Avenue, Conference Room 160

JULY 24, 2009

3:30-5:00 PM

Meeting Agenda

3:30 – 3:45 Introductions

1. Review committee structure

3:45 – 4:00 Overview of Project

5. Project Goals
6. Project Timeline – 3 total meetings

4:00 – 4:45 Questionnaire Discussion

4. Identify Current green companies and markets
5. Understand existing markets – growing or slowing?
6. Discuss future opportunities

4:45 - 5:00 Review of Next Meeting

2. Challenges to growth
3. Challenges to finding employees



GREEN JOBS TASK FORCE QUESTIONNAIRE
JULY 24, 2009

Organization: Cincinnati Workforce Network (Elijah Rudolph)
Address: _____

- 1. When was your organization founded?**
3 year initiative to focus Cincinnati area workforce programs
- 2. How has your organization changed (grown) as a result of your sustainable initiatives/programs/products?**
(% change in billings, SF, projects, etc.)
- 3. What green products or services does your organization provide?**
Collecting data and creating a forum in late September to determine what skill set is needed for advanced manufacturing?
- 4. Who are your biggest competitors (regional / international)?**
- 5. What are your future plans for expansion?**
Community Action Agency – manufacturing skills standards
- 6. What do you see as major opportunities?**
- 7. What policies/incentives have helped, or will help your organization?**

GREEN JOBS TASK FORCE QUESTIONNAIRE
JULY 24, 2009

Organization: Cincinnati State (Ralph Wells)
Address: _____

- 1. When was your organization founded?**
- 2. How has your organization changed (grown) as a result of your sustainable initiatives/programs/products?**
(% change in billings, SF, projects, etc.)
2 new teaching positions
In two years, Renewable energy program has grown to more than 100 people
- 3. What green products or services does your organization provide?**
Training – workforce and 2-4 year students
- 4. Who are your biggest competitors (regional / international)?**
- 5. What are your future plans for expansion?**
Certificates (construction and 3rd year LEED Certificates)
Collaborations with University of Cincinnati
- 6. What do you see as major opportunities?**
Research/Training collaborations with UC
- 7. What policies/incentives have helped, or will help your organization?**



GREEN JOBS TASK FORCE QUESTIONNAIRE
JULY 24, 2009

Organization: Duke Energy (Dick Brewer)
Address: _____

- 1. When was your organization founded?**
- 2. How has your organization changed (grown) as a result of your sustainable initiatives/programs/products?**
(% change in billings, SF, projects, etc.)
- 3. What green products or services does your organization provide?**
- 4. Who are your biggest competitors (regional / international)?**
- 5. What are your future plans for expansion?**
Make customers more efficient through rebates and energy audits
- 6. What do you see as major opportunities?**
Energy efficiency, renewable energy, district energy distribution
Smart grid technology being rolled out in our Midwest service territory over the next few years. Continued escalation of energy efficiency programs/projects and renewable energy installations to meet requirements of SB221
- 7. What policies/incentives have helped, or will help your organization?**
Renewable energy portfolio mandates and energy efficiency mandates (not sure these actually "help", but are programs directly affecting our business).

GREEN JOBS TASK FORCE QUESTIONNAIRE
JULY 24, 2009

Organization: Melink Corporation (Jeremy Chapman)
Address: Milford

- 1. When was your organization founded?**
- 2. How has your organization changed (grown) as a result of your sustainable initiatives/programs/products?**
(% change in billings, SF, projects, etc.)
Added 3 new business units: 1. Intellihood - 90% manufactured in Ohio, 2. Testing and balancing services, 3. Renewable energy solutions – Aventa, low velocity wind turbine (Ingrid) 2010 to begin manufacturing blades?
- 3. What green products or services does your organization provide?**
Intellihood, Wind, Solar (china/germany), solar thermal
- 4. Who are your biggest competitors (regional / international)?**
National accounts
- 5. What are your future plans for expansion?**
Aventa – bring manufacturing to Cincinnati
Solar Thermal – Freeman Schwab
- 6. What do you see as major opportunities?**
Provide Utility Workforce training – within 3-5 years, 50-60% of Utility workforce will retire
- 7. What policies/incentives have helped, or will help your organization?**
Take advantage of Ohio House Bill 1 – municipalities and townships can finance special energy improvements through real estate taxes



GREEN JOBS TASK FORCE QUESTIONNAIRE

JULY 24, 2009

Organization: Brotherhood of Railway Carmen (Phil Amadon)

Address: Labor Council, AFL-CIO
Cincinnati

1. When was your organization founded?

"1884"

2. How has your organization changed (grown) as a result of your sustainable initiatives/programs/products?

(% change in billings, SF, projects, etc.)

"We are on the cutting edge of green mass transit"

The American Federation of Teachers and the Utility Workers Union have both recently joined the Blue Green Alliance

3. What green products or services does your organization provide?

"Rail Transportation, Construction and Manufacturing for the Labor Council"

Laborers have a goal to create a LEED-GA apprenticeship program

4. Who are your biggest competitors (regional / international)?

"Companies that want to drive labor below the living wage and politicians that do not support rebuilding the national infrastructure."

5. What are your future plans for expansion?

"Organize to promote green investment"

6. What do you see as major opportunities?

"Rail transit expansion, green manufacturing and construction"

"Please include the following 3 companies in future meetings – Steelcraft, IlSCO, and Clermont Steel - these are steel working firms suitable for green energy parts/components."

3-C rail corridor – estimates of 16,000 Ohio Jobs paying \$40-45K/year

Obama National Rail Transportation Plan

7. What policies/incentives have helped, or will help your organization?

"Development of economy toward green jobs, good jobs... Lots of Them!"



GREEN JOBS TASK FORCE QUESTIONNAIRE
JULY 24, 2009

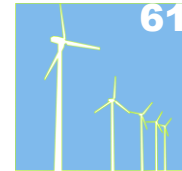
Organization: University of Cincinnati (Ray Miller)
Address: _____

- 1. When was your organization founded?**
- 2. How has your organization changed (grown) as a result of your sustainable initiatives/programs/products?**
(% change in billings, SF, projects, etc.)
UC now offers an Energy Auditing Certificate through the college of Engineering and Applied Science
- 3. What green products or services does your organization provide?**
- 4. Who are your biggest competitors (regional / international)?**
Regional Competitors (other schools)
- 5. What are your future plans for expansion?**
College of Applied Science to expand
- 6. What do you see as major opportunities?**
Provide Utility Workforce training – within 3-5 years, 50-60% of Utility workforce will retire
- 7. What policies/incentives have helped, or will help your organization?**
ARRA/Grants, Department of Labor, Department of Energy, State of Ohio

GREEN JOBS TASK FORCE QUESTIONNAIRE
JULY 24, 2009

Organization: Blue Chip Solar and Wind DayLeit.com
Leitner Electric Co.Perry Leitner, Pres.
Address: _____
10939-A Reed Hartman Hwy
Cincinnati, OH 45242

- 1. When was your organization founded?** 1978
- 2. How has your organization changed (grown) as a result of your sustainable initiatives/programs/products?**
(% change in billings, SF, projects, etc.) We have expanded in all directions including products, staff, and revenues.
- 3. What green products or services does your organization provide?**
Commercial and Residential Solar and Wind, Wind studies for large and small wind turbines
Advanced Energy Efficient Lighting in LED and Plasma-Induction
- 4. Who are your biggest competitors (regional / international)?**
Legitimate businesses, we are learning of many new unlicensed and non-certified, unlicensed new entrants into the marketplace.
- 5. What are your future plans for expansion?**
We have grown with representatives now in 7 states and 14 cities. Our plans are for slow and continued careful growth.
- 6. What do you see as major opportunities?** This recession ending.
- 7. What policies/incentives have helped, or will help your organization?** Utility companies, ODOD, NREL, DOA, and Federal Gov't. Tax credits.



GREEN JOBS TASK FORCE MEETING #2

LOCATION: Hamilton County Business Center

1776 Mentor Avenue, Conference Room 160

August 31, 2009

3:30-5:00 PM

Meeting Agenda

Objective: Review and Identify Opportunities and Challenges to Green Growth

3:30 – 3:40 Introductions

3:40 – 4:00 Discussion of New Questionnaires

4:00 – 4:20 Review database of existing green companies

1. Who's in the database that doesn't belong?
2. Who's missing?

4:20 - 4:55 Challenges to Green Growth

1. Challenges to growth
 - a. Networks
 - b. Investment
 - c. Overcoming upfront costs (clients and companies)
2. Challenges to finding employees
 - a. Training requirements

4:55 - 5:00 Review Next Meeting

1. September 28, 2009, [3:30-5:00pm], Room 160, HCBC
 - a. Review/Discuss solutions, programs, and incentives



GREEN JOBS TASK FORCE MEETING #2

LOCATION: Hamilton County Business Center

1776 Mentor Avenue, Conference Room 160

August 31, 2009

3:30-5:00 PM

Meeting Notes

Objective: Review and Identify Opportunities and Challenges to Green Growth

1. Introductions

- a. See attached sign-in sheet for meeting attendees

2. Discussion of New Questionnaires

- a. No new questionnaires for discussion

3. Review database of existing green companies

- a. The group reviewed the proposed database of existing green companies in the study area. There was no discussion regarding companies that were falsely assigned to any category.
- b. Several suggestions for further resources to identify green companies were discussed
 - i. *Renewable Energy Component manufacturing:*
 1. University Clean Energy Alliance Ohio
 2. Duke Energy Generating Services
 3. Janice Urbanik agreed to research Siemens to evaluate if any renewable energy components are being manufactured locally.

ii. *Clean Automobiles:*

1. Phil Amadon agreed to research Ford Motor Co. in Sharonville to determine if components for electric-vehicles would be manufactured there. Shawn to email "Green Car Guide" criteria and score to Phil for benchmarking.

iii. *Mass Transit/Rail Transportation*

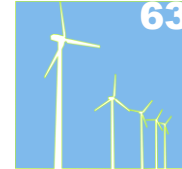
1. Phil Amadon agreed to research local rail transportation manufacturing and repair activities that occur within the study area

iv. *Green Chemical Manufacturing*

1. The group agreed that this market would be the most difficult to quantify
2. Griffin Industries was suggested as a re-processor of used cooking oils into biodiesel.

4. Full discussion of Challenges to Green Growth

- a. Challenges to growth for any company (regardless of whether they are "Green", or not, include
 - i. Networks – having a supply chain, and a customer base



1. Need a “foot in the door” with global/national players in green markets
 - ii. Investment
 1. Facility improvements
 2. Equipment purchasing
 3. Raw material purchasing
 - iii. Overcoming upfront costs
 1. Cost of finished product is too high – needs subsidy to be competitive with traditional products
 - iv. Challenges to finding employees
 1. Employees are not skilled in the correct areas
- b. All manufacturing processes require lots of energy. Overcoming the challenge of 90%+ coal produced energy for SW Ohio is important for “Green” oriented companies.
- c. Current workforce numbers are not static. – Center for Energy Workforce Development aging of the workforce reports – within 10-15 years many existing machinists and skilled trades people will be retiring, without younger apprentices to replace them.
- d. Fewer and fewer apprenticeship programs exist for skilled trades.
 - i. Need to evaluate existing apprenticeship programs in Ohio – Janice Urbanik agreed to forward on research that she had conducted into this

5. General Discussion for Steering Committee

- a. Potential exists for companies to be doing great things, but not be included in our database because they do not meet our current definition of “Green Business”
 - i. Smart Paper – does not produce FSC certified paper products, however, they operate a co-gen facility off of industrial process waste, and are a net producer of energy.
 - ii. Gorilla Glue – glues that meet VOC limits for healthy indoor air quality, but are not Green Seal Certified.
- b. Proposed quantifiable definition for determining a “Clean Automobile”
 - i. Vehicles that are classified as Zero Emission Vehicles (ZEV) by the California Air Resources Board
 - ii. Vehicles that achieve a minimum green score of 40 on the American Council for an Energy Efficient Economy (ACEEE) annual vehicle rating guide (See attached excel file)
 - iii. Vehicles that achieve a Class Ranking of “Above Average” in the ACEEE Green Book.

6. Next Meeting

1. September 28, 2009, [3:30-5:00pm], Room 160, HCBC
 - b. Objective: Review/Discuss solutions, programs, and incentives



GREEN JOBS TASK FORCE MEETING #3

LOCATION: Hamilton County Business Center

1776 Mentor Avenue, Conference Room 160

September 28, 2009

3:30 - 4:30 PM

Meeting Agenda

Objective: Review Solutions, Programs, and Incentives

3:30 – Introductions

3:30 – 3:45 Discussion of Policy Framework

1. Greening existing jobs
 - a. Needs
 - b. Opportunities
2. New green jobs
 - a. Needs
 - b. Opportunities

3:45 – 4:00 Review Existing Policy Framework

3. Federal / State
4. County / City
5. Other

4:00 - 4:20 Review Policy Examples / Proposals

1. Ohio WIND Energy Network
2. Minnesota Green Jobs Task Force
3. Other

4:20 - 4:30 Final Report Presentation TBD



**Appendix B:
2009 Jobs Data**



SOC Code	Description	2009 Jobs	2009 LQ	2016 LQ
41-9011	Demonstrators and product promoters	1,225	1.41	1.41
47-1011	First-line supervisors/managers of construction trades and extraction workers	5,888	0.83	0.82
47-2011	Boilermakers	133	0.93	0.95
47-2021	Brickmasons and blockmasons	972	1.04	1.01
47-2022	Stonemasons	251	0.70	0.67
47-2031	Carpenters	9,224	0.87	0.86
47-2041	Carpet installers	323	0.80	0.81
47-2042	Floor layers, except carpet, wood, and hard tiles	200	0.73	0.73
47-2043	Floor sanders and finishers	201	0.83	0.81
47-2044	Tile and marble setters	393	0.75	0.74
47-2051	Cement masons and concrete finishers	1,476	1.05	1.09
47-2053	Terrazzo workers and finishers	85	0.88	0.87
47-2061	Construction laborers	7,351	0.77	0.76
47-2071	Paving, surfacing, and tamping equipment operators	259	0.60	0.59
47-2072	Pile-driver operators	190	0.89	0.87
47-2073	Operating engineers and other construction equipment operators	2,403	0.82	0.79
47-2081	Drywall and ceiling tile installers	1,017	0.96	1.11
47-2082	Tapers	544	1.25	1.39
47-2111	Electricians	5,320	1.07	1.05
47-2121	Glaziers	457	1.17	1.14
47-2131	Insulation workers, floor, ceiling, and wall	342	1.66	1.96
47-2132	Insulation workers, mechanical	52	0.24	0.25
47-2141	Painters, construction and maintenance	3,046	0.84	0.80
47-2142	Paperhangers	108	0.94	0.91
47-2151	Pipelayers	564	0.77	0.74
47-2152	Plumbers, pipefitters, and steamfitters	3,407	1.04	1.04
47-2161	Plasterers and stucco masons	103	0.30	0.32
47-2171	Reinforcing iron and rebar workers	45	0.22	0.22
47-2181	Roofers	1,098	0.93	0.87

SOC Code	Description	2009 Jobs	2009 LQ	2016 LQ
47-2211	Sheet metal workers	933	0.82	0.79
47-2221	Structural iron and steel workers	684	1.40	1.43
47-3011	Helpers, brickmasons, blockmasons, stonemasons, and tile and marble setters	224	0.62	0.58
47-3012	Helpers, carpenters	136	0.25	0.25
47-3013	Helpers, electricians	635	0.92	0.92
47-3014	Helpers, painters, paperhangers, plasterers, and stucco masons	46	0.32	0.32
47-3015	Helpers, pipelayers, plumbers, pipefitters, and steamfitters	295	0.54	0.55
47-3016	Helpers, roofers	66	0.48	0.44
47-3019	Helpers, construction trades, all other	47	0.24	0.25
47-4011	Construction and building inspectors	764	0.86	0.85
47-4021	Elevator installers and repairers	343	1.98	1.92
47-4031	Fence erectors	100	0.41	0.40
47-4041	Hazardous materials removal workers	502	1.63	1.32
47-4051	Highway maintenance workers	1,178	1.22	1.22
47-4061	Rail-track laying and maintenance equipment operators	36	0.33	0.31
47-4071	Septic tank servicers and sewer pipe cleaners	70	0.34	0.30
47-4091	Segmental pavers	59	1.29	1.23
47-4099	Construction and related workers, all other	416	1.07	1.06
47-5012	Rotary drill operators, oil and gas	36	0.16	0.17
47-5013	Service unit operators, oil, gas, and mining	36	0.12	0.13
47-5021	Earth drillers, except oil and gas	74	0.39	0.38
47-5031	Explosives workers, ordnance handling experts, and blasters	37	0.73	0.71
47-5041	Continuous mining machine operators	43	0.45	0.44
47-5042	Mine cutting and channeling machine operators	43	0.52	0.51
47-5049	Mining machine operators, all other	43	0.85	0.81
47-5051	Rock splitters, quarry	40	0.50	0.46
47-5061	Roof bolters, mining	27	0.33	0.29



SOC Code	Description	2009 Jobs	2009 LQ	2016 LQ
47-5081	Helpers, extraction workers	53	0.23	0.20
47-5099	Extraction workers, all other	38	0.35	0.30
49-2092	Electric motor, power tool, and related repairers	214	1.14	1.17
49-2094	Electrical and electronics repairers, commercial and industrial equipment	667	1.27	1.23
49-2095	Electrical and electronics repairers, powerhouse, substation, and relay	74	0.44	0.45
49-2096	Electronic equipment installers and repairers, motor vehicles	86	0.57	0.56
49-3011	Aircraft mechanics and service technicians	483	0.58	0.54
49-3031	Bus and truck mechanics and diesel engine specialists	2,208	1.14	1.15
49-3043	Rail car repairers	107	0.59	0.58
49-9043	Maintenance workers, machinery	429	0.85	0.83
49-9051	Electrical power-line installers and repairers	622	0.78	0.77
49-9098	Helpers--Installation, maintenance, and repair workers	566	0.55	0.55
51-1011	First-line supervisors/managers of production and operating workers	5,887	1.27	1.24
51-2011	Aircraft structure, surfaces, rigging, and systems assemblers	62	0.23	0.21
51-2021	Coil winders, tapers, and finishers	59	0.38	0.37
51-2022	Electrical and electronic equipment assemblers	1,109	0.80	0.77
51-2023	Electromechanical equipment assemblers	331	0.78	0.75
51-2031	Engine and other machine assemblers	679	2.67	2.49
51-2041	Structural metal fabricators and fitters	510	0.68	0.59
51-2091	Fiberglass laminators and fabricators	101	0.39	0.40
51-2092	Team assemblers	8,232	1.13	1.12
51-4011	Computer-controlled machine tool operators, metal and plastic	983	1.06	1.01
51-4021	Extruding and drawing machine setters, operators, and tenders, metal and plastic	856	1.45	1.46
51-4022	Forging machine setters, operators, and tenders, metal and plastic	67	0.36	0.35
51-4023	Rolling machine setters, operators, and tenders, metal and plastic	677	2.86	2.59

SOC Code	Description	2009 Jobs	2009 LQ	2016 LQ
51-4031	Cutting, punching, and press machine setters, operators, and tenders, metal and plastic	2,224	1.46	1.42
51-4032	Drilling and boring machine tool setters, operators, and tenders, metal and plastic	437	1.98	1.89
51-4033	Grinding, lapping, polishing, and buffing machine tool setters, operators, and tenders, metal and plastic	615	1.02	0.97
51-4034	Lathe and turning machine tool setters, operators, and tenders, metal and plastic	457	1.23	1.18
51-4035	Milling and planing machine setters, operators, and tenders, metal and plastic	161	0.88	0.84
51-4041	Machinists	4,947	1.80	1.74
51-4051	Metal-refining furnace operators and tenders	59	0.43	0.37
51-4052	Pourers and casters, metal	151	1.38	1.08
51-4121	Welders, cutters, solderers, and brazers	2,349	0.85	0.80
51-4122	Welding, soldering, and brazing machine setters, operators, and tenders	1,013	1.98	1.84
51-4191	Heat treating equipment setters, operators, and tenders, metal and plastic	263	1.62	1.54
51-8011	Nuclear power reactor operators	71	1.21	1.24
51-8012	Power distributors and dispatchers	71	0.78	0.79
51-8013	Power plant operators	244	0.91	0.91
51-8021	Stationary engineers and boiler operators	328	1.12	1.11
51-8091	Chemical plant and system operators	290	0.91	0.77
51-8092	Gas plant operators	61	0.52	0.48
51-8093	Petroleum pump system operators, refinery operators, and gaugers	58	0.17	0.13
51-9011	Chemical equipment operators and tenders	880	2.37	2.24
51-9012	Separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders	508	1.70	1.66
51-9021	Crushing, grinding, and polishing machine setters, operators, and tenders	171	0.60	0.59
51-9041	Extruding, forming, pressing, and compacting machine setters, operators,	705	1.30	1.30



SOC Code	Description	2009 Jobs	2009 LQ	2016 LQ
51-9051	Furnace, kiln, oven, drier, and kettle operators and tenders	118	0.75	0.74
51-9061	Inspectors, testers, sorters, samplers, and weighers	3,910	1.23	1.23
51-9141	Semiconductor processors	92	0.33	0.29
51-9197	Tire builders	57	0.39	0.34
51-9198	Helpers--Production workers	4,379	1.37	1.35
53-4019	Locomotive engineers and operators	343	1.04	0.94
53-4021	Railroad brake, signal, and switch operators	112	0.75	0.69
53-4031	Railroad conductors and yardmasters	115	0.54	0.51
53-4099	Rail transportation workers, all other	110	2.75	2.59
53-7021	Crane and tower operators	128	0.42	0.38
53-7031	Dredge operators	155	1.95	1.90
53-7081	Refuse and recyclable material collectors	994	0.93	0.80
Total		105,266	0.92	0.89



**Appendix C:
Case Study Database**



Canada

Sustainable Development Technology Canada

(<http://www.sdtc.ca/en/index.htm>) – a non-profit foundation created in 2001 by the Canadian government to finance and support development of clean technology. They have two main funds:

- SD Tech fund (\$550 M)– is meant to support “late-state development and pre-commercial demonstration of clean technology solutions: products and processes that contribute to clean air, clean water and clean land, that address climate change and improve the productivity and the global competitiveness of the Canadian industry”. This fund does not have to be repaid.
- NextGen Biofuels Fund (\$500 M) – meant to support “commercial scale demonstration facilities for the production of next-generation renewable fuels and co-products” to help Canada meet its Renewable Fuel standards. Grants from this fund have to be repaid once the new tech is profitable.

United States

- Texas – Number of cities are focusing on bringing clean energy tech to their locals, for jobs creation, etc. (<http://www.wacotrib.com/news/content/news/stories/2008/08/31/08312008wacgreenjobs.html>) This article states that Texas is an early leader in wind power in the US, and that they’re trying to build more. Number of cities are working on ways to attract more green businesses (Waco, Austin, as examples) and the universities and colleges are upping their offering for green tech and jobs training.
- Illinois – Rockford Region offers a number of incentive programs for new entrepreneurs, existing or new businesses, and manufacturers in an effort to encourage green industry to come to the region (<http://www.rockfordil.com/incentives>)

Japan

- Announced it would expand green business and create up to 1 million new jobs in the ‘green business’ market, including offering zero interest loans for green companies (<http://www.reuters.com/article/vcCandidateFeed2/idUST327766>)
- Investing \$30 B in environment and energy sectors over the next 5 years (<http://www.meti.go.jp/english/policy/GreenITInitiativeInJapan.pdf>)

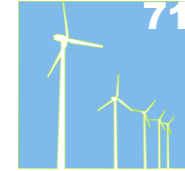
South Korea

- \$38 B to be invested over 4 years to create 960,000 new green jobs, including creation of green transport networks, 2 million green homes, and clean-up of four main rivers in the country. (<http://www.unep.org/Documents/Multilingual/Default.asp?DocumentID=556&ArticleID=6035&l=en>)

China

http://www.businessweek.com/magazine/content/09_21/b4132040805185.htm?chan=magazine+channel_in+depth

- China is largest producer of PV panels in the world
- 2nd largest market for wind turbines
- Goal to boost % of energy from renewable to 23% by 2020
- Recent economic stimulus package includes \$ earmarked for clean tech
- Finance Ministry has financial incentives, including subsidy of \$3/watt solar capacity installed in 2009
- Himin Solar Energy Group – world’s largest producer of rooftop piping systems for solar water heating.
- Insists on collaboration with major companies (GE, Wal-Mart, DuPont, 3M, Siemens)
- Government is heavily subsidizing green industries (such as electric cars, PVs, etc.)



- Solar subsidies (<http://www.reuters.com/article/GCA-GreenBusiness/idUSTRE56K3W720090721>)

France

- (<http://www.dw-world.de/dw/article/0,,4676121,00.html>) France intends to unveil a 16 month rebate program on electric / hybrid cars, and will also offer 400 M Euros over 4 years for green car development

Germany

- (<http://www.businessgreen.com/business-green/news/2248348/germany-approves-500-million>) Government is investing 500 M Euros into electric car development by 2011.

United Kingdom

- Low Carbon Industrial Strategy: Grants available (out of 10 M Euros) for 20 best low carbon communities (<http://decc.gov.uk/en/content/cms/news/pn109/pn109.aspx>)
- Automotive Assistance Program (<http://www.berr.gov.uk/whatwedo/sectors/automotive/aap/page50296.html>) – primary goal is to support continued development / research into low-carbon emitting vehicles.
- 250 M Euros in incentives for purchasing electric vehicles through 2011 (<http://www.goauto.com.au/mellor/mellor.nsf/story2/7A46E378A0F5AD6DCA25759E00274743>); this also includes 20 M Euros for upgrades / additions to infrastructure for charging stations, etc.
- Low Carbon Buildings Programme (<http://www.lowcarbonbuildings.org.uk/about/>) – grants for installing PVs, wind turbines, small scale hydro, solar hot water, ground source heat pumps, air source heat pumps, biomass.

- Low Carbon Building Programme Phase 2, headed by British Gas (<http://www.britishgas.co.uk/energy-efficiency/products/energy-innovation/low-carbon.html>) – 50 M Euros in grants available for “installation of microgeneration technologies for local housing authorities, housing associations, schools and other public sector buildings and charitable bodies..”
- Low Energy House – Green Grants (<http://www.lowenergyhouse.com>)
- Energy Savings Trust (<http://www.energysavingtrust.org.uk/What-can-I-do-today/Energy-saving-grants-and-offers/Search-for-grants-and-offers>) – Grants and offers for energy saving measures for buildings

India

- New Ventures: Venture capital for green projects / businesses - <http://www.newventuresindia.org/nvi/newdesign/index.jsp>

Successful workforce training programs

United Kingdom

- UK Green Building Council has launched a Sustainability Training & Education Programme (STEP) task group to set up the STEP program (<http://www.ukgbc.org/site/info-centre/display-category?id=79>)



Germany

- Siemens just built a new wind power training center in Bremen, which will provide training for wind energy technicians in the country and from around the world.

US - National:

- Walmart Foundation Green Jobs Initiative (<http://walmartstores.com/CommunityGiving/8975.aspx>) – Grants totaling \$6.1 M to groups to help create jobs in emerging green industries, and to develop green job training sites in WA, CO, NM, and LA.
- Veterans Green Jobs (<http://veteransgreenjobs.org/>) – provides education and career development opportunities on green jobs for US military veterans. Also runs Veterans Green Corps, in collaboration with Southwest Conservation Corp
- US Dept of Labor:
 - ARRA Energy Training Partnership Grants (\$100 M) to 20-30 projects that provide training and placement services in energy efficiency and renewable energy industries
 - ARRA Pathways out of Poverty Grants (\$150 M) for projects to provide training / placement services into employment in energy efficiency / renewable energy industries.
 - ARRA State Energy Sector Partnership & Training Grants (\$190 M) for state workforce investment boards for workforce sector strategies that target energy efficiency and renewable energy
 - ARRA Green Capacity Building Grants (\$4 M) to fund projects that build the capacity of DOL-funded training programs to ensure targeted groups are prepared to meet the country's expanding green industries.

US - State-specific

- California – (Sept 09) \$75 M green jobs training program (<http://www.energy.ca.gov/greenjobs/>) – the largest green jobs training program in the US. Intends to train over 20,000 workers for renewable energy jobs (manufacturing, installing, etc.)
- Florida (Aug 09) – City of Miami got \$500,000 in grants from EPA to train people for jobs assessing / cleaning brownfield sites. (<http://www.environmental-expert.com/resultEachPressRelease.aspx?cid=7698&codi=59692>)
- Ohio (Aug 09) - \$100,000 for weatherization training in Cleveland
- Massachusetts (<http://boston.bizjournals.com/boston/stories/2009/08/31/daily14.html>) – MA Green Jobs Act of 2008: \$4 million in grants available through the Massachusetts Clean Energy Center to job training institutions to “develop vocational programs in the cleantech sector”.
- Michigan – Detroiters working for Environmental Justice Green Jobs Training Program (http://www.dwej.org/Green_Jobs.htm) -
- Minnesota:
 - (<http://www.mngreenjobs.com/>) – Action plan has suggestions for how legislation can increase # of green jobs in the state (including specific focus on renewable energy)
 - Green Jobs Act (<http://www.greenforall.org/resources/summary-of-minnesota-green-jobs-act-2007>) – passed in 2007; signed into law in 2008. This act seeks to advance green economic development while creating living wage jobs. Act includes loans for improvement to building energy use, and created a green jobs task force.
- New Jersey – Green Job Training programs (http://www.state.nj.us/dca/hmfa/gho/news/2009/pdf/20090717news_GreenJob.pdf) – training programs for both adults and youth.



Adults – Isles' Center for Energy and Environmental Training (done with NJ Dept of Labor and Workforce Development). Training for 'youths = New Jersey Youth Corps program which offers green jobs training for ages 16 – 25.

- **New Mexico** - (<http://www.rdcnm.org/LinkClick.aspx?fileticket=xBmCUzPV64A%3D&tabid=1726>) – New Mexico Green Collaborative – got \$500 M from ARRA for green jobs training in the state.
- **New York:**
 - Sustainable South Bronx (<http://www.ssbx.org/index.php>) – offers training for green jobs, among other benefits.
 - Green Jobs / Green NY Act of 2009 (http://www.gouverneurtimes.com/index.php?option=com_content&view=article&id=6327:senate-passes-green-jobs-act&catid=60:st-lawrence-news&Itemid=175) - \$112 M, to be used to create 14,000 green jobs; primary focus is on building retrofitting. Act also includes loans for retrofitting and for energy audits.
- **North Carolina** – North Carolina State Board of Community Colleges – established a green training initiative called 'Code Green', which entails major expansion of green-collar workforce training programs on all their campuses. (<http://www.chathamjournal.com/weekly/news/chathamschools/cc-c-in-forefront-of-training-green-collar-workforce-90411.shtml>)
- **Rhode Island** - \$17.2 M for workforce training grants (from ARRA) for job training. While this is not all reserved for green jobs only, green industries are given preference.
- **Tennessee** (<http://tn.gov/wap/>) – Weatherization assistance program, as well as program to train people to do energy audits and to become weatherization contractors.
- **Washington** – Senate Bill 5649 designates \$14.5 M (funding comes from ARRA) to be used for green job training programs, and for weatherizing homes and businesses, and to provide grants for

neighborhood energy-efficiency projects around the state.

(<http://www.greenforall.org/resources/washington-senate-bill-5649>)

Canada

- **BlueGreen Jobs** (<http://www.bluegreencanada.ca/index.php>) – Green jobs training programs (specifically for steelworkers) throughout Canada
- **Clean Energy Classrooms** (<http://www.cleanenergyclassrooms.ca/government-initiatives/>) – a list of local government initiatives for clean energy in Canada

United States

- Energy Efficiency Opportunity Fund (<http://dealbook.blogs.nytimes.com/2009/09/25/aiming-to-create-green-jobs-and-profits/>) – new social investment fund that will finance projects like building retrofits. Fund is sponsored by Living Cities and Green For All.
- Energy Efficiency & Conservation Block Grant Program (<http://www.eecbg.energy.gov/>) - \$2.7 B in available funds for grants to states, local governments and tribes to “develop and implement projects to improve energy efficiency and reduce energy use and fossil fuel emissions in their communities.” The link provided also shows a list of all applicants which have received money so far.
- Green for All Capital Access Program (<http://www.greenforall.org/what-we-do/capital-access-program>) – designed to assist investors, non profits, and businesses to get involved in the clean energy economy; offers assistance in securing stimulus and other funds to create green jobs, etc.





**Appendix D:
Organization Information**





Blue Green Alliance

The Blue Green Alliance is a national partnership of labor unions and environmental organizations dedicated to expanding the number and quality of jobs in the green economy. With partners USW, Sierra Club, CWA, NRDC, LIUNA, SEIU, AFT and UWUA, the Blue Green Alliance is uniting eight million people in pursuit of good jobs, a clean environment and a green economy.

www.bluegreenalliance.org

Greater Cincinnati Foundation

The Greater Cincinnati Foundation is the Tristate region's community foundation. GCF is a nonprofit organization created by and for the people of Greater Cincinnati to provide a simple, powerful, and highly personal approach to giving. GCF offers a variety of giving tools to help people achieve their charitable goals – and create lasting good work in their communities.

www.greatercincinnati.org

emersion DESIGN

emersion DESIGN is a full service architecture, planning, engineering, design, and sustainability consulting firm. emersion DESIGN is a collaborative practice driven by a passion for exceptional design and planning that advance clients & society. We have been recognized for our research in sustainability and social responsibility, and have published and spoken extensively on sustainability topics ranging from planning, design, and construction to government policy and green jobs.

www.emersiondesign.com

Davis Langdon

Davis Langdon provides comprehensive consulting services to owners, architects, government agencies and institutions. Founded in 1974, Davis Langdon has 8 offices nationwide with a total staff of over 110. With five interrelated specialist business units which cover cost management, sustainability consulting, research, project management and risk consulting, we are able to service our client's projects from a broad perspective. Services are tailored to the specific needs of projects, sometimes functioning individually, and often as an integrated service.

www.davislangdon.com

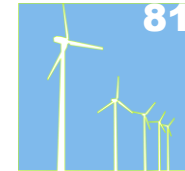




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