Green jobs for Flint and Genesee County

A report prepared for

Advanced Solutions Group, LLC

by

American Green Careers, LLC

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Flint, MI 48507

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What is a Green Job?

A core principle of the Energy Efficiency and Conservation Block Grant is to invest funds in programs and projects that create and/or retain jobs and stimulate the economy while meeting program energy goals. For this reason, it's important to evaluate what jobs can be created from energy efficiency and conservation. For many, jobs in the energy efficiency and renewable energy sectors are considered 'Green Jobs'. But what is a green job, and how can municipalities foster green job creation in their communities?

Despite the fact that there is more interest than ever before in 'green jobs' and the potential boost to the economy from new technologies and industries related to energy and the environment, there exists no universally agreed upon definition of what a green job is. And because it has only recently been identified as a Workforce Development opportunity, there is no standardized approach for evaluating its potential.

State of Michigan Definition

Despite the lack of a standardized definition, state and local governments across the country have begun to develop their own definitions of a green job. For example, the State of Michigan broadly defines Green jobs as jobs that help to improve the environment and also create opportunities to help revitalize the economy and get people back to work[1].

The State of Michigan, in a report released in May, further defines the 'Green Economy' as industries that provide products or services related to:

- Agriculture and natural resource conservation,
- Clean transportation and fuels,
- Increased energy efficiency,
- Pollution prevention or environmental cleanup, and
- Renewable Energy production.

The State is defining Green jobs as all occupations necessary to sustain and grow these emerging sectors.

How are Green Jobs Similar or Different from Existing Jobs?

Many organizations and government agencies differ on the breath of occupations that are considered to be green jobs. The National Institute for Occupational Safety and Health (NIOSH) classifies green jobs as including the following types of work:

- Traditional jobs that use green products (e.g., a plumber installing a low flow toilet).

[1] State of Michigan Green Jobs Report, May 2009.

- Green jobs that encompass tasks from traditional jobs (e.g., an electrician installing solar panels).
- Jobs that are relatively new stemming from an increasing focus on energy efficiency (e.g., Energy Auditors, Weatherization Technician).

The following table lists the State of Michigan green job sectors, the jobs that comprise them, and traditional jobs that may now be considered green jobs.

Figure 1. Traditional Jobs, Green jobs

Traditional Jobs ***Green jobs***

Michigan Green jobs Field	Traditional Jobs	Green jobs
Increased energy efficiency	HVAC Contractor Insulation Installer	Energy Auditor, Weatherization Technician
Clean transportation and fuels	Automotive Engineer	Hybrid Engine Designer/Builder
Renewable energy production	Sheet Metal Workers, Machinists, Truck Drivers	Wind Turbine Manufacturer
Agriculture and natural resource conservation	Farmer	Organic Farmer
Pollution prevention or environmental cleanup	Environmental Engineer	Environmental Engineer

Suggested questions to consider when defining a green job:

- How competitive does the level of green job training an employee has make them in their job?
- In what sectors are green jobs considered to be?
- Does the job benefit the environment?
- Does the industry or business that the job comes from have an environmentally-friendly:
    - Process
    - Product
    - Purpose

Defining 'Green Jobs' is critical to a municipal government's development of a strategy to create green jobs. How a green job is defined affects a program's guiding principles, goals and objectives, implementation, as well as how to measure program success. It is also important for public education and outreach efforts. Determining how a green job is defined should be the first step of any municipal green job creation initiative.

Benefits of Green Jobs

Green jobs in energy efficiency (e.g. building retrofits) or renewable energy (e.g. solar panel installation) are generally jobs that can't be outsourced. In addition, Green jobs, often referred to as "Green Collar" jobs, can be "Blue Collar" jobs, such as manufacturing and skilled trades, as well as "White Collar" jobs, such as technological or engineering based jobs. Either way, jobs classified as green jobs generally pay competitive wages. Employees who complete green job training generally become more competitive. For example, an electrician who receives Solar Panel installation training is now eligible to work for a Solar Panel Installation company and go from earning $27.00/hour to $40.00/hour[2].

Green jobs in new and emerging fields also stimulate the economy. For example, in the Green Construction Market alone, U.S. Green Building Council (USGBC) estimates the following nationwide economic impact[3]:

	2000–2008	2009–2013
GDP	$173 billion	$554 billion
Jobs	2.4 million	7.9 million
Wages	$123 billion	$396 billion

Other benefits of Green Jobs include environmental benefits, reduced energy consumption, and reduced dependence on foreign oil and coal imports.

According to the USGBC Green Construction and Renovation generated $1.3 Billion in energy savings from 2000-2008. It is forecasted that from 2009-2013 the green construction market is expected to generate $6 billion in energy savings[4].

[2] www.wikipedia.org/wiki/greenjob
[3] U.S. Green Building Council Green Jobs Study Summary, Booz Allen Hamilton, July 2009, Washington D.C.
[4] U.S. Green Building Council Green Jobs Study Summary, Booz Allen Hamilton, July 2009, Washington D.C.

Green Jobs in Energy Efficiency

The Recovery Act and the EECBG in particular is focused on creating jobs in the energy efficiency and renewable energy fields. The following table lists jobs related to the sectors mentioned in the EECBG, and the State of Michigan green jobs sectors.

	EECBG	State of Michigan
(Building) Energy Efficiency	X	X
Transportation	X	X
Renewable Energy	X	X
Materials Recovery	X	
Greenhouse Gas Recovery	X	
Agriculture and Natural Resource Conservation		X
Pollution Prevention or Environmental Cleanup		X

The following describes green job opportunities that are particularly relevant to the City of Flint.

Buildings

Of all 'Green' industries, energy efficiency is considered to be the low hanging fruit – the sector where the biggest savings to the economy are possible as well as the one where we can put people to work immediately.

All of the above mentioned sectors involve energy efficiency or energy conservation in some way. For example, in the Transportation Sector, the primary aspect that makes Alternative Fuel Vehicles green is that they run more fuel efficiently. In the waste and materials recovery sector, recovering materials, reusing them, or recycling them into other products saves the energy it takes to extract raw materials. Producing energy locally, such as through solar panels installed on municipals buildings, saves the energy that gets lost in the distribution when energy gets distributed across a grid.

However, in our assessment, of all of the above mentioned energy efficiency sectors, the single sector that stands to reap the biggest immediate financial Return on Investment is the building and construction sector through energy efficiency in residential, commercial, and municipal buildings.

There are three types of buildings that require professionals who are versed in energy efficiency:

- New construction
- Rehabs/Reconstruction
- Retrofits

Green jobs in the Building Retrofit industry present an opportunity for Flint and Genesee County to create jobs that can't be outsourced, diversify the economy, reduce energy consumption and our dependence on foreign oil while creating new job opportunities.

According to the U.S. Bureau of Economic Analysis (BEA), every $1 million spent in the construction industry, which includes home remodeling and bridge construction, generates 26.67 jobs. These include "direct" and "indirect" jobs[5]. Indirect jobs are those created because of expenditures for construction other than wages and benefits, such as suppliers of insulation, blower doors, infrared scanning equipment, vans, efficient appliances and heating systems, as well as conventional building materials and tools, as well as experts employed to train the program's "green collar" workforce to use these new tools and to become skilled energy auditor/inspectors.

Jobs in Building Energy Efficiency include:

Energy Auditors
Inspect buildings for inefficient heating and cooling technologies, lighting, windows, and insulation. Auditors make recommendations to upgrade the inefficient systems to demonstrate the savings value and educate consumers about tax incentives and return on investment from retrofit work.

Weatherization Technicians
Weatherization is the practice of modifying a building to reduce energy consumption. Administering air sealing, insulation, duct sealing, measuring indoor air quality, and basic mechanical system updates are part of the weatherization process.

Measurement & Verification Professionals
Third Party Inspectors who measure and verify energy savings in buildings after retrofit work has been completed (typically used in Commercial applications). M&V professionals follow the standards set forth in the Efficiency Valuation Organization's (EVO) International Performance Measurement & Verification Protocol (IPMVP). IPMVP is a widely referenced framework for 'measuring' energy or water savings. M&V contractors are almost always third party independent contractors, which is important for verifying energy savings. Often M&V

[5] Economic Opportunity Studies. How Many Workers Does the Weatherization Assistance Program Employ Now? What Jobs Will the Recovery Act Offer? Washington, D.C.

contractors are the same professionals who do Commissioning or Re-Commissioning for commercial buildings.

More information about grant funding and other resources for building programs through the U.S. Department of Energy's Building Technologies Program is available at: http://www1.eere.energy.gov/buildings/

Renewable Energy

Flint's skilled workforce in manufacturing and the skilled trades, as well as its manufacturing facilities and infrastructure are assets that make it attractive as a location for a Renewable Energy project. Through a power purchase agreement and leveraging EECBG funding, the City can appeal to Wind Turbine Manufacturers, Solar Power Manufacturers, and others.

Established Flint Green Businesses

1. Flint Solar Photovoltaic Installation Company (Howard Croft/Mid-Michigan Solar, LLC).

2. Flint Solar Thermal Panel Manufacturer (Ken Pethers/ Sunsiaray, LLC).

Material Recovery

While Deconstruction is considered by many to not be cost effective compared to demolition labor costs, there are many benefits. Forty percent of the total solid waste stream in the US is construction and demolition waste[6], although diversion rates of 80% are possible and are being achieved in regions throughout the country. For example, Albuquerque, New Mexico plans to eliminate their landfill entirely by 2030. Landfill tip fee rates greatly affect the cost effectiveness of taking construction and demolition wastes to the landfill. Also, deconstructing buildings not only creates jobs, it puts valuable materials back into the market. Building deconstruction is the reuse and recycling of building materials. One study on the cost effectiveness found that deconstruction can be more cost effective than demolition when demolition contractor also operate resale companies[7].

Other Potential Green Jobs

The EECBG encourages innovation, and the green jobs and sectors mentioned in this report are only a brief summary of all the possibilities that exist for green job creation.

Potential Flint Green Employee-Owned Business Cooperatives

Mondragón Cooperative Corporation (MCC) a 16 Billion € (Euro) network of Spanish Cooperatives has a US outreach arm which does training and consulting for Industrial Worker Cooperatives and other Cooperatives. MCC has expressed a willingness to consult and support establishing cooperatives in Flint. American Green Careers is in discussions with MCC regarding providing Cooperative Education and Training. Businesses could be implemented as Green Employee-Owned Business Cooperatives. In Cleveland, OH the Evergreen Cooperative Development Fund is establishing Green Employee-Owned Business Cooperatives, which could

[6] LEED Building Practices.
[7] http://www.lifecyclebuilding.org/files/Six%20House%20Building%20Deconstruction.pdf

be emulated in Flint. *"Evergreen Cooperative Laundry will open its doors this summer [2009] as the first industrial-scale green laundry in Northeast Ohio. Its initial customer base will be health care institutions, nursing homes, and hotels, and it will hire 50 low- and moderate-income residents from Greater University Circle neighborhoods. Ohio Solar Cooperative will own, install, and maintain solar panels on the rooftops of Cleveland's large, nonprofit anchor institutions. It will hire and train under-employed residents from local neighborhoods. Its first installations will begin in August [2009] and its goal is to develop workforce capacity to carry out installations throughout Ohio. A third project is Evergreen City Growers, a year-round, large-scale, food production greenhouse using hydroponics to grow green leafy vegetables and other crops. The plan includes an 8- to 10-acre facility to annually produce up to 8 million heads of lettuce, with a goal of opening in 2010[8]."*

Financing Incentive Programs

Weatherization and Retrofitting of Residential and Commercial Businesses

As relates to energy efficiency and conservation, weatherization and retrofitting of residential, commercial, and municipal buildings is considered to be the 'low-hanging fruit' – the work that can be done with the greatest payback from the least investment. As such, the potential for creating jobs from energy auditing, weatherization, and retrofitting will be this report's primary focus. However, many more opportunities for creating green jobs in the Flint and Genesee County region exist, especially in terms of new technologies associated with renewable and clean energy. This report outlines the challenges and the opportunities for developing green jobs related to energy efficiency and conservation, as well as other key focus areas.

The financial and energy savings gained from weatherization can often more than pay for the cost of the retrofitting. However, to reap these benefits, a homeowner or business owner must first make an initial capital investment. As with any investment, a homeowner or business owner must consider the following questions, which also correlate with the three biggest hurdles to their implementation:

1. What is the up-front capital investment required?
2. What is the return on investment?
3. If I invest in energy efficiency improvements and then decide to sell my home or move my business, will the responsibility for the loan stay with me, or with the house or business location?

Weatherization Assistance Program

Other funding for retrofits includes the Weatherization Assistance Program (also known as the low-income Weatherization Program). An ongoing program that received $5 billion in this year's Recovery Act funding for low-income households to complete retrofits, 10 times the annual funding prior to this year. The Federal standards for these programs only require 10-15% increase in energy efficiency of a home although 40-60% energy savings are possible and may result in a larger Return on Investment. A family of four that earns less than $44,100 a year can qualify for the low-income program.

[8] http://www.clevelandfoundation.org/uploadedFiles/Donor%20Connections%20-%20Spring%202009.pdf

Incentives for the Middle Class

Vice President Joe Biden's Middle Class Task Force has recently proposed a program called Recovery through Retrofits. The program will make it easier for cities to set up programs that encourage homeowners to have retrofits done on their homes. Similar to other infrastructure improvements, city financing mechanisms can encourage homeowners to take out loans to financing retrofits:

"The Vice President's Middle Class Task Force program is intended to expand a national energy retrofit market beyond the low-income weatherization program. To make financing for efficiency improvements more attractive, the report suggests adding the cost of retrofits to a homeowner's property tax bill. If a house were sold, the buyer would continue to pay for the improvements through the tax bill. The costs would be spread out over enough time so that the monthly payments generally would be lower than the savings on utility bills. Another program, to make energy-efficiency expenses part of the mortgage when a house is bought or refinanced, is already available, but the report said there have been "significant barriers" to widespread use. It suggests ways to overcome those barriers, such as making it easier to rate a house's energy performance. Part of today's announcement will be a new $454 million program from the Department of Energy that will look for ways to retrofit residential and commercial buildings in entire neighborhoods or communities, taking advantage of economies of scale that would lower individual costs[9]."

Pilot Program

One strategy that City may employ to begin a program employing energy efficiency professionals is to fund residential energy efficiency audits and retrofits through a Pilot Program.

According to the most recent U.S. Census data, there are approximately 24,000 Owner-Occupied homes in the city of Flint. If we assume that at least 50% of these would achieve significant energy savings from a home retrofit, then 12,000 homes could be retrofitted in Flint in the coming years.

Weatherization Technician	Total Homes	Years	Homes Retrofitted/Year	#Days	Working Days/Year	#Houses/Year	4-man crews (240)	4-man crews (2400)
4	12,000	5	2400	4	240	60	16	160
Energy Auditor	**Total Homes**	**Years**	**Homes Retrofitted/Year**	**#Days**	**Working Days/Year**	**#Houses/Year**	**2-man crews (240)**	**2-man crews (2400)**
2	12,000	5	2400	1	240	240	2	20

How many people would this employ? Based on input from industry professionals, the most comprehensive Energy Audit takes a team of two Energy Auditors one full day per house. It takes a crew of four Weatherization Technicians four full days to complete a retrofit. Using these numbers, we estimate that over 5 years 12,000 homes in the City of Flint could be

[9] http://headlines.ocregister.com/news/energy-47296-house-program.html

retrofitted employing 160 Weatherization Technicians and 20 Energy Auditors. In addition to employing Flint residents, this program will allow homeowners to save 40-60% on their energy bills, further stimulating the economy.

While the funding in the EECBG is insufficient to fund a city-wide residential retrofitting program, the City may consider consolidating its revolving loan fund (RLF) monies with Genesee County, in order to fund a Pilot Program that could retrofit 50 homes.

The chart below states potential funds available for a RLF and the estimated number of homes that could participate in the loan program at one time.

EECBG Recipient	RLF	Cost/Home	# Homes Retrofitted
Flint	$250,000	$15,000	17
Genesee County	$500,000	$15,000	33
Total	$750,000	15000	50

A Pilot Program such as this would also require investment in the required equipment to perform energy efficient retrofits:

Equipment/EA Crew	Equipment/WT Crew
$10,000	$27,000-$50,000

Revolving Loan Fund

Municipalities may use EECBG funds to carry out activities aimed at meeting the goals of the EECBG in several ways. One way is to establish financial incentive programs for energy-efficiency improvements. A financial incentive program that has gained popularity across the country as a means of promoting energy efficiency (Green For All, personal communication) is what is called a revolving loan fund. A Revolving Loan Fund is "a loan program, usually sponsored by a government entity, in which a specific amount of public funds is set aside to make loans for delineated purposes. As the loans are repaid, the funding pool is reallocated and loaned out again (smarte.org)."

The key to the RLF being applied to an energy efficiency program is that the energy savings are projected to equal the cost of the improvements over time. A city may use up to 20% or $250,000 of the EECBG for establishment of revolving loan funds (with jurisdictions permitted to pool their funds into a single fund).

Portland Model

The City of Portland, Oregon, has gained national recognition for its creation of a revolving loan fund that enables Portland homeowners to take out long-term, low-interest loans and repay them through small additions to their utility bills[10]. The home energy retrofits will save energy and lower bills, while creating construction jobs. The revolving loan fund is putting federal

[10] http://www.cleanenergyworksportland.org/faq.php

Recovery dollars to work in a smart way. While in its pilot phase, the program will improve 500 homes and create 40 jobs. According to the City's Mayor, the City expects to retrofit 100,000 homes over the next 10 years, employing 1,000 people to retrofit those homes during that time period.

How the Portland program works:

1. Homeowners sign up for a home energy assessment through Energy Trust of Oregon.
2. Energy Trust will schedule the home energy assessment to be performed by a certified Building Performance Institute contractor and provide an "Energy Advocate" to explain recommended measures and financing options, and help the homeowner through the installation process.
3. Homeowners will choose which options best meet their needs. At least one option will be a scenario where energy savings are projected to equal the cost of the improvements over time.
4. In coordination with the Energy Advocate, the contractor will then arrange to have the energy efficiency improvements made.
5. Homeowners pay nothing up front. Repayment is available on their utility bill.

Long term, all improvements from insulation to space heaters to windows to solar photovoltaics will be available. However, the pilot focuses on key weatherization efforts.

Pilot	**Full roll-out**
• Basic weatherization (insulation, air sealing, duct sealing) • Space heating (furnace or heat pump) • Hot water (gas, electric, tankless gas)	• Basic weatherization (insulation, air sealing, duct sealing) • Space heating (furnace or heat pump) • Hot water (gas, electric, tankless gas) • Solar hot water • Solar photovoltaic • Windows

The financing terms are "at or below market interest rates with longer than typical amortization periods. The program is designed to offer "equitable access among a variety of income levels and credit qualities".

Municipal Energy Financing

Property tax or municipal energy financing allows the costs of retrofits to be added to a homeowner's property tax bill, with monthly payments generally lower than utility bill savings[11]. This arrangement attaches the costs of the energy retrofit to the property, not the individual, eliminating uncertainty about recovering the cost of the improvements if the property is sold.

In conclusion, by promoting job creation and stewardship of our energy and natural resources Flint can establish itself as a leader in being "green", and set an example for what cities can do.

[11] Recovery Through Retrofits program of the Vice President's Middle Class Task Force

Appendix I: Green Job Training and Certification

Some green jobs do not require specialized training or the receipt of specialized certifications or licensing (Appendix II). However, certain certifications are required for federally funded programs. To qualify to receive funding for low income programs, certain Federal guidelines must be met. For example, the Recovery Act requires that contractors hired to perform energy audits be certified by RESNET as a HERS Rater or by BPI as a Building Envelope Analyst.

The State of Michigan No Worker Left Behind initiative funds green job training programs for unemployed workers. In addition, funding for pathways out of poverty programs can be used to pay for green jobs training, as well for support services for workers while they are in the training, like child care.

Certification Required for Employment in Building Retrofits

Job Title	Employers	Certification Required for Employability?	Certification and Certifying Agency	Training Providers in Flint and Genesee County	Cost of Training	Funding Available
Energy Auditor	Utilities, HVAC companies, electricians, electrical contractors, Energy Saving Companies (ESCOs), Insulation Companies, GCCARD	Yes - for federally funded programs. In addition, some utilities such as DTE reimburse at the highest rate for Energy Auditors that have a HERS Rater certification.	Home Energy Rating System (HERS) through RESNET and Building Analyst certifications through the Building Performance Institute (BPI).	American Green Careers	$5,000	No Worker Left Behind, Trade Adjustment Act (TAA), other Federal programs.
Weatherization Technician	Utilities, HVAC companies, electricians, electrical contractors, Energy Saving Companies (ESCOs), Insulation Companies, GCCARD	Yes - for federally funded programs. In addition, must have Builders License in order to make over $600 in modifications to a building.	Envelope Analyst certification through the Building Performance Institute (BPI)	American Green Careers	$5,000	No Worker Left Behind, Trade Adjustment Act (TAA), other Federal programs.
Measurement and Verification Professional	M&V, Commissioning, and Re-Commissioning Companies	No. M&V professionals follow the IPMVP guidelines. M&V contractors are almost always third party independent contractors.	Efficiency Valuation Organization (EVO) produces the International Performance Measurement & Verification Protocol (IPMVP).	N/A	N/A	N/A

Training Programs in Flint and Genesee County

Training Provider	Name of Training Program	Date Available	Certificate / Degree
Baker College	Mechanical Engineering	Available	Bachelor's
	Architectual Construction Tech.	Available	Certificate
	Architectual Construction Tech.	Available	Associates
	Automotive Services Tech.	Available	Certificate
	Electronic Engineering Tech.	Available	Associates
	Industrial Management	Available	Bachelor's
	Industrial Technology	Available	Bachelor's
	Mechanical Engineering Tech.	Available	Associates
	Environmental Science and Planning	Available	
CS Mott Community College	Hybrid Automotive Vehicles	2010	Certificate
	HVAC Program	Available	Certificate & As
	Building Construction	Available	Certificate & As
	Sustainable Construction	2010	Certificate
	Demolition and Deconstruction	2010	Course
	Building Construction Remodeler	2010	Course
	Concentrated Welding Technician Program	Available	Certificate
Delta College	Alternative Energy/Wind Turbine Tech.	Available	Associates
	Water Environment Technology	Available	Associates
	Chemical Process Technologist	Available	Associates

Training Provider	Name of Training Program	Date Available	Certificate / Degree
Kettering University	Concentration in Sustainable Energy and Hybrid Technology	Available	MS in Engineering
	Concentration in Automotive Systems	Available	MS in Engineering
	Solar Energy Training	Workshops	Workshops
Oakland Community College	Green building, renewable energies, and energy management.	Available	Courses
University of Michigan Ann Arbor	Master's of Energy Systems Engineering	Available	Master's
University of Michigan Flint	Applied Science	Available	Bachelor's
	Engineering	Available	Bachelor's
	Physics	Available	Bachelor's
	Biology	Available	Bachelor's
	Chemistry	Available	Bachelor's

Appendix II: Resumes

Karl Morgan Kaufman

kkaufman@americangreencareers.com

Founded American Medical Careers, Inc. (AMC), and American Green Careers, LLC. (AGC), and serves as President and CEO for the Flint, Lansing & Detroit locations. Led AMC in training over 3,700 dislocated and underemployed workers for family-supporting medical career pathways. Directed the 2005-2007 initiative to establish an innovative one-year Practical Nursing education program in Flint. Licensed by the Michigan Board of Nursing in 2007, the PN Program's third cohort of students began in September, 2009. Guided AMC's request for a grant of institutional accreditation from the Accrediting Council for Continuing Education & Training (ACCET), with a currently projected award date of April, 2010. AMC/AGC has been accepted as the first Building Performance Institute (BPI) Affiliate in Eastern Michigan. Demonstrates core strengths in futuristic, strategic ideation. Currently establishing American Green Cooperative Institute in affiliation with Mondragon International, as a 501c3 charged to support establishment of long-term sustainable Employee-Owned Business Cooperatives in Flint, MI.

EDUCATION:

The University of the State of New York, Albany, NY
Associate in Applied Science - Nursing Degree: Jan. 1992

Saginaw Practical Nurse School, Saginaw, MI
Practical Nurse Certificate: Feb. 1981

LICENSURE & CERTIFICATION:

Michigan Registered Nurse, 1992- 2011
Train-The-Trainer, State of Michigan, Bureau of Health Services, 2001-2010

PROFESSIONAL AFFILIATIONS:

Director, Former Treasurer: Michigan Association of Career Colleges & Schools
Member: Chief Executive Forum

PROFESSIONAL EXPERIENCE:

2002 – Current **AMERICAN MEDICAL CAREERS, INC.**

FLINT, MI Founder, President & CEO – Started Genesee CNA Academy, Inc. in 2002, a State-Licensed Proprietary School subsequently re-named American Medical Careers, Inc. (AMC). Serves as President and CEO for AMC's Flint, Lansing & Detroit locations, where over 3,700 dislocated and underemployed workers have been trained for family-supporting Nursing and Medical careers. Founded innovative one-year Practical Nursing program in 2007.

2008 – Current **AMERICAN GREEN CAREERS, LLC. –** A DIV. OF AMERICAN MEDICAL CAREERS, INC. -

FLINT, MI Founder – Green Training Division established in recognition of the emerging need to train workers for green jobs in the new green economy. Current programs include Energy Auditor, Weatherization Technician and Energy

Efficiency Specialist. AMC/AGC has been accepted as the first Building Performance Institute (BPI) Affiliate in Eastern Michigan.

2009 – Current **AMERICAN GREEN ENERGY OPTIMIZATION, LLC.**
FLINT, MI Founder – Established to provide Energy Efficiency services.

2007 –2008 **21ST CENTURY GREEN SOLUTIONS, LLC.**
FLINT, MI Co-Founder – Established start-up to license mid-scale 600 kW European wind turbine technology for manufacture & assembly in Flint, Michigan.

1981 - 2002 **MULTIPLE NURSING EMPLOYERS**
Intensive Care, Emergency, Medical/Surgical & Long Term Care Nursing
Critical Care Registered Nurse (CCRN) Professional Certification 1997-1999.

EARL H. GREENE JR.

earl.greene@att.net

Summary of Qualifications

Detail-oriented, accomplished Manufacturing Systems Engineer that offers a solid background of progressive, responsible experience. Innovative and organized with a history of developing dynamic strategies and translating them into practical tactics that produce significant results. Outstanding communication, negotiation, and interpersonal skills with a reputation for forming productive business relationships at all levels. Independent self-starter and natural leader that fosters collaborative efforts. Strong critical thinking, problem solving, and time management skills with proven success handling multiple responsibilities in fast-paced environments. Knowledgeable and skilled in:

- Project Management
- Research and Analysis
- Customer Relations
- MS Office
- Launch Coordinator
- Quality Engineer
- Test Engineer
- ISO QS-9000
- Product Engineer
- DFM and DFA

Top Career Accomplishments

Coordinated the design and build of a new Test Process; Functional Tester that saved millions of dollars. Contribute significantly to the successful launch of new products by proactively identifying potential issues with parts and process; effectively managing the purchase and internal build of assembly equipment. Responsible for the purchasing of equipment and successful launch of several projects that meet metrics of Quality and Rate. Nominated for the Martin Luther King Drum Major Award for my years of voluntary service tutoring math to the enter city youth.

Professional Experience

AMERICAN GREEN CAREERS, INC, FLINT, MI June 2009 - Current

Green Program Instructor

- Co-authored curriculums for teaching building energy audits and weatherization with an emphasis on the fundamentals of building science, health and safety and combustion safety testing per the Building Performance Institute (BPI).
- Trained students on how to calculate building component heat loss, payback (PB) and return on investment (ROI) for recommended measures.
- Demonstrated and taught students how to use a blower door, duct blaster, infrared camera, and combustion gas analyzer equipment.

DELPHI, FLINT, MICHIGAN 1988 – 2008

Sr. Manufacturing Systems Engineer

- Responsible for ensuring the design intent of new production equipment.
- Update PFMEA's and Process Control Plans as needed.
- Work with all functional areas to maintain uptime and operational availability of production processes and equipment.
- Responsible for ensuring the quality of equipment and processes for new product launches for the automotive product line.

- Oversee all Engineering aspects of Production Parts Approval Process (PPAP) as it relates to processes and equipment.
- Work with Quality to find Root Cause and Corrective Action for internal and external Customer returns.

US ARMY CORP OF ENGINEERS, VICKSBURG, MISSISSIPPI 1980 – 1983

- Electronic Equipment Technician
- Responsible for the installation electronic equipment for measuring wave, current, and tide data.
- Responsible for the upgrade of electronic equipment for monitoring data collection devices.
- Responsible for upgrading procedures used in capturing wave data in harbors and water inlets around the country.

UNITED STATES MARINE CORPS, SAN DIEGO, CALIFORNIA 1977 – 1980

MICHIGAN BIO-MEDICAL LABORATORY, FLINT, MICHIGAN 1975 – 1977

- Bio-Medical Technician
- Responsible for analyzing Blood and other Bio-Medical samples.
- Responsible for informing Doctors of any abnormal test results.
- Responsible for calibrating equipment used in the testing process.

Education

NORTH CAROLINA A&T STATE UNIVERSITY, GREENSBORO, NORTH CAROLINA
Bachelor of Science Electrical Engineering, *1986*

ALCORN STATE UNIVERSITY, LORMAN, MISSISSIPPI
Associates Degree in Engineering,
Minors in Math, Computer Science, and Physics, 1983

University of Michigan, Flint, Michigan
PRE-MEDICAL STUDENT, 1977

National AWARDS & HONORS:
Who's Who Among Students in American Universities and Colleges: 1981 - 1982
National Dean's List and Trustee Scholarship: 1980 - 1983

JENNIFER KIRVALYN YOUNG

youngjenk@gmail.com

EDUCATION

University of Michigan
M.S. 2008 School of Natural Resources & Environment Resource Policy & Behavior

Eastern Michigan University
B.S. 2003 Biology Department Major in Biology

AWARDS

Rackham Graduate Student Research Grant (2008), University of Michigan.
School of Natural Resources and Environment Opus Research Grant (2008), University of Michigan.
Marshall Weinberg Fund Fellowship (2007), University of Michigan.
Meta Hellwig Special Study Undergraduate Scholarship (2002), Eastern Michigan University.

GRANTS

Galápagos Invasion Earthwatch Expedition (2005-2006), Earthwatch Institute. Approximate funds raised for environmental research: $210,000 (Co-Principal Investigator).

Invasive plants impact on the Galápagos petrel (2004), American Bird Conservancy. Funds raised for environmental research $5,000 (Co-Principal Investigator).

PROFESSIONAL EXPERIENCE

Independent Contractor: American Green Careers
2009 – Present Flint, MI

- Developing curriculum for Battery Technician program.

Project Analyst: Resource Recycling Systems, Inc.
2008 – 2009 Ann Arbor, MI

- Conducted data analysis on the availability of wood biomass for power plants.
- Collected benchmark data on recycling practices through fact finding phone interviews with Department of Public Works officials in cities throughout the United States.
- Created GIS maps.
- Wrote Request for Proposals and evaluation criteria.
- Conducted 'Regulated Medical Waste' audits at Henry Ford Hospital.
- Developed budget projections and financial modeling for recycling programs.

Assistant Research Scientist: Food System Economic Partnership
2007 – 2008 Ann Arbor, MI

- Conducted statistical analysis and wrote report on the economic potential of urban gardening.
- Report available at: http://fsepmichigan.org/reports/Economic%20Potential%20of%20Urban%20Gardening%20in%20Southeast%20Michigan

Intern: Food System Economic Partnership
2007 Ann Arbor, MI

- Wrote and applied for grants and program funding.
- Implemented online farm product directory.

- Facilitated community outreach activities.
- Developed and edited newsletter and educational materials.

Research Assistant & Co-Principal Investigator: Earthwatch Institute
2005 – 2006 (Four field seasons) Galápagos Islands, Ecuador

- Directed international research project to assess the impact of invasive species in the Galápagos.
- Coordinated activities and facilitated communication between faculty at Eastern Michigan University, researchers at the Charles Darwin Research Station, staff at the Galápagos National Park Service, the Earthwatch Institute Project Manager and volunteers.
- Conducted training and field instruction for over 90 international volunteers from ages 16-75 with varying levels of knowledge of and experience with the research topic.

Co-Campaign Manager: State Representative Steve Tobocman
2004 Detroit, MI

- Set-up campaign office.
- Directed volunteer activities.
- Engaged the public through door to door canvassing in Southwest Detroit.
- Facilitated the successful re-election of a State Representative.

PROFESSIONAL DEVELOPMENT

Thirteen years experience with an international leadership and development training company.

Introduction Leaders Program: Landmark Education
2009 – Present Livonia, MI

- Trained in presenting to the public, communication, team work, and breakthrough performance.

Assisting Team Leader: Landmark Education
2007 – Present Livonia, MI

- Schedule and lead orientations to an 'Assisting Program'.
- Administer weekly and monthly reporting on program metrics.

Course Supervisor: Landmark Education
2000 – 2007 Livonia, MI

- Produced over 40 weekend seminars with 50-200 participants.
- Prepared for and directed logistical management of event production.
- Accountable for the success and training of over 300 production team members in a 7 year period.
- Interfaced between staff, program leaders, production team, and course participants.

RELEVANT COURSES

NRE 550: Systems Thinking for Sustainable Development & Enterprise (Dr. Thomas Gladwin)
NRE 570: Microeconomics with Natural Resource Applications (Dr. Michael Moore)
NRE 574: Sustainable Energy Systems (Dr. Gregory Keoleian)