## New and Expanding Market Investigations: Exploration into an “Energy Management Studies” Program

**Boston University Metropolitan College, April 2009**

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### NEMI Background

New and Expanding Market Investigations (NEMI) was developed by the Office of Student and Corporate Outreach in collaboration with MET faculty and staff. The goal of these investigations is to identify new areas for program development, gain a deeper understanding into industry trends, and understand the implications for increasing student enrollments.

### Inquiry Overview

The authors proposed a program on “Energy Management Studies”, envisioned as a rigorous, interdisciplinary academic with a focus on scientific and policy problem-solving. It would be oriented towards students wanting to take advantage of professional green collar opportunities such as LEED certification, energy savings, energy investment, energy analysis, and management of installations. The authors sought assistance in collecting industry feedback, employment trends, identifying similar program offerings, and defining the target market for such a program.

### Methodology

To get a sense of overall trends in the field of energy, the lead researcher attended a variety of lectures and events on the topic and visited numerous job-seeking related Web sites to identify the types of jobs that exist, or are expected to exist, in this area. The lead researcher identified the key skills sets required for energy-related jobs by interviewing industry and community leaders; posting a request for feedback using the professional networking site, Linked In; and reviewing the requirements listed in relevant job descriptions. Lastly, the lead researcher identified universities and training vendors currently offering programs on the topic of energy by conducting a general internet scan. *For a list of primary and secondary sources used in this research, please see Exhibit A: Research Sources.*
Executive Summary

The following represents a summary of the key trends uncovered through this research investigation:

- **The majority of the “green collar” jobs expected to be created through the American Recovery & Reinvestment Act do not necessarily align with MET’s core competencies, as they are more technical and labor intensive in nature.** However, industry experts predict there will be a demand for professionals with the policy skills to understand the new legislation being passed on a state and federal level, and the project management skills to successfully implement new energy management and sustainability programs.

- **MET can leverage its existing curricula in Project Management and City Planning as a foundation on which to build a niche Graduate Certificate or Master's degree program on sustainability or energy management.** Such a program would appeal to a manager level professional working in the public or private sector.

- **The working title of “Energy Management Studies” evokes a program that is more technical in focus than MET would be able to offer.** It is suggested that the program title include the words “Energy and Sustainability” to give it less of a technical connotation.

- **MET should pay close attention to CPE’s Leadership in Energy and Environmental Design (LEED) preparation course, being offered this spring.** Presently, LEED is the industry standard for energy efficiency in buildings. A person becomes LEED accredited, enabling him or her to certify a building. Many other universities and training programs have sold out seats for their LEED preparation courses and have had to offer multiple sessions to meet the great demand. MET will need to determine whether the content of LEED would make an appropriate academic, for-credit offering.

- **MET should also be aware of similar initiatives taking place within Boston University.** Currently faculty in the College of Engineering, the School of Management, and the Center for Energy and Environmental Studies are collaborating to create a series of interdisciplinary courses on energy that graduate students in all programs can apply towards their degrees.
Key Findings

Policy and Workforce Development Trends

With the arrival of a new administration, the idea of the “green economy” is becoming increasingly mainstream. In the recently passed American Recovery & Reinvestment Act of 2009, roughly $92 billion will be invested in clean technology, including a $500 million Green Jobs Act that will train 70,000 workers in renewable energy and energy efficiency jobs over two years. Closer to home, the green revolution has manifested itself in Massachusetts’s passing of the Green Jobs Act, and Boston University’s recent hiring of a new Sustainability Director.

Given Massachusetts’s prioritizing of these issues, and the expected growth in this industry, more people will be looking for training and education in the area of energy and sustainability. It must be noted that many of the anticipated jobs will be in construction and manufacturing and will require practical training rather than classroom education. The job growth in the areas of Engineering, Legal, Research and Consulting, that will align more closely with MET’s core strengths, is not expected to be as rapid.

According to the study, “U.S. Metro Economies: Green Jobs in U.S. Metro Areas, October 2008, Current and Potential Jobs in the U.S. Economy”, Boston is in top 5 Metropolitan Areas for Green Jobs in US. There were approximately 19,299 “green jobs” in the Boston-Cambridge-Quincy MA-NH region in 2006. More than half of these jobs were in Engineering, Legal, Research and Consulting--“indirect” jobs to Green Economy. The report noted that wind energy is currently the fastest growing alternative energy source in the country.

The report anticipates that 156,660 new green jobs will be created through 2038 in the Boston-Cambridge-Quincy MA-NH area. It expects that these jobs will be primarily in construction and manufacturing. It also projects that there will be a single indirect job for every two direct jobs in the future, which is well below the historical pattern. Therefore, job growth in the areas of Engineering, Legal, Research and Consulting, that will align more closely with MET’s core strengths, is not expected to be as rapid.

The study “Green Collar Jobs in the U.S. and Colorado” prepared by Management Information Services for the American Solar Energy Society, notes promising statistics, in that the renewable energy industry grew more than three times as fast as the U.S. economy in 2007 (not including hydropower). Renewable energy is also growing more rapidly than the energy efficiency industry, but the energy efficiency industry is currently much larger than the renewable energy industry. According to the study, renewable energy and energy efficiency can create millions of well-paying jobs, many of which are not subject to foreign outsourcing. These jobs are in two categories that every state is eager to attract: college-educated professional workers (many with advanced degrees), and highly skilled technical workers.
For an overview of different aspects of the green industry see Exhibit B: Overview of Green Industry.

**LEED**


The Leadership in Energy and Environmental Design (LEED) Green Building Rating System is the nationally accepted benchmark for the design, construction and operation of high performance green buildings, managed by the US Green Building Council (USGBC), a non-profit organization whose mission is to “transform the way buildings and communities are designed, built and operated, enabling an environmentally and socially responsible, healthy and prosperous environment that improves quality of life.” Currently, buildings in the US are responsible for 72% of electricity consumption and 39% of CO2 emissions.

**Demand for LEED-certified buildings and professionals is booming due to unprecedented governmental initiatives, heightened residential demand and improvements in sustainable materials.** Individuals can become LEED accredited by successfully taking the LEED Accredited Professional Exam, which enables an individual to facilitate the rating of buildings with the various LEED systems.

**Key Takeaway:** New jobs will be created as a result of the Obama Administration’s focus on energy efficiency and the “green economy.” However, many of these jobs will be more technically focused and labor intensive, and not necessarily be a match for MET’s core competencies. If MET does decide to offer an energy related program, it may want to align the content with LEED in order to ride the wave of this accreditation’s popularity.

**Program Content Suggestions**

**Feedback from Industry**

Interviews with government and industry leaders revealed the skills they look for when hiring new employees, thereby providing suggestions of content that should be incorporated into a program on Energy Management studies:

*Jim Hunt, Chief of Environmental and Energy Services for City of Boston:*
  - Suggests developing a program that will create the ‘Energy Manager’.
  - Program would include following topics:
    - Procurement
    - Energy Markets
- Commodities
- Performance Contracting
- Project Management

He also thinks the energy industry is going in the direction of price response. There is a clear technology element involved to monitor systems and create software applications to measure building performance.

Kurt Gaertner, Director of Urban Sustainability at the Massachusetts Executive Office of Energy and Environmental Affairs

- Massachusetts Department of Energy Resources is hiring:
  --Statisticians and Economists: People who can do modeling to determine what our greenhouse emissions are; need to set a baseline of current emissions so we can set a target.
  --Policy Experts: Need to understand regulatory changes, manage/start dialogues.
  --Technical Assistance: Energy audit program needs program managers and city planners.
  --Outreach Coordinators: People who will help cities/towns implement energy practices consistent with Green Communities Act.

- Mentioned the importance of considerations beyond energy efficiency, like land use/development patterns so that buildings are close to public transportation and/or within walking distance from most people who will be using them.

Ted Barton, Head Principal, Epsilon Associates

- Massachusetts has programs underway to collect up to $400-500 million/year tax payer money (surcharges on electric bill) aimed to improve energy efficiency and reduce green house gas emissions.
- Need people with quantitative skills and policy skills to make good use of this money so these programs become an effective reality.
- Need a balance of analytical skills, policy skills, project/program management skills.
- There should be a basic course on “energy science” that includes a little chemistry, physics, heat and mass transfer, units, power flow—what most engineers take in first 2-3 years of college. Should cover the “language of energy”, e.g. BTUs (British Thermal Units). They don’t need to become experts, but need to understand language and have enough quantitative skills to work effectively field.
- May also need a survey course on Greenhouse Gas and Climate Change.

Marc Aronson, Business Development Manager, Constellation Energy

- Should include a mix of technical and financial content.
- Should teach people how to conduct energy audits—how a building operates.
- Should include a course on renewable energies: Biomass, Solar, Wind, Geothermal.
**Jill Santopietro, Talent Manager, CB Richard Ellis**

- When hiring they look for people who are LEED accredited—shows a commitment to energy.
- LEED is the gold standard when it comes to buildings.
- Suggests we look into standards around other aspects of energy (e.g. farmland).

**Job Descriptions**

A review of energy related job descriptions on various job-seeking Web sites revealed qualifications that many employers require. Of particular note were those competencies that align with current MET offerings. This exercise also demonstrated that certain job titles, such as Director of Energy Management Services, are too technical to align with a potential MET program. A MET program might, however, offer desirable project management and policy skills that would complement those of a student with an engineering background.

*To see examples of specific green job descriptions see Exhibit C: Green Jobs Examples.*

**LinkedIn**

The lead researcher posted the below discussion thread on a number of LinkedIn groups, including Sustainability Professionals, Renewable Energy Business Network, Clean Energy Community, CleanTech, Alternative Energy Network, Green, The-Green-Group.com, and FountainBlue:

*I work for a university that is in the very early stages of developing a program on "Energy Management Studies". We are interested in feedback as to the content you would like to see in such a program, based on where you perceive there to be a skills gap between potential employees and current jobs in the clean tech industry/jobs you predict will be created as this field grows.*

The respondents to this topic provided content suggestions that would align more closely with a technical training or engineering program and would not be of interest to the reader. Based on these responses, as well as further discussion with the proposal authors, it is clear that the title “Energy Management Studies” evokes too much of a technical/engineering type of program. It has instead been suggested to use a working title of Master of Science in Energy and Sustainability.

**Key Takeaway:** There is demand among energy related employers for project management and policy skills. MET should build upon its existing courses in Project Management, City Planning and Urban Affairs, and create a new course that provides more of a scientific overview of energy, environment and sustainability. The program title should be changed to incorporate the word “sustainability” so that it does not connote a program more technical in nature and attract the wrong audience.
Competitive Program Scan

The lead researcher collected a variety of programs through internet research, events and colleague referrals on the topic of energy and sustainability. The programs have been categorized, where possible, according to the primary discipline area (e.g. Business, Environmental Studies, Urban Planning/Public Policy, and Engineering). The lead researcher paid particular attention to programs offered by schools in the Boston area. At the time of research the following schools were not currently offering programs similar to the program proposal: Northeastern, Bentley, Babson and BC.

Harvard Extension, Lesley University and Brandeis offer relevant programs that should be further examined.

The programs included in the Business and Environmental Studies sections may be of most interest to MET as it explores this initiative further. The lead researcher will collaborate with MET’s Marketing Department to collect additional intelligence on these programs through mystery shopping.

*For complete list see Exhibit D: Competitive Program Scan.*

Internal Scan of Boston University Resources

The lead researcher compiled a list of relevant resources within Boston University through colleague referrals and internet research. Resources include relevant courses and programs offered through MET other BU colleges, university initiatives and clubs, and specific faculty and staff contacts who may have expertise in a related area.

Of particular note is that faculty within SMG, ENG, and the CEES program are collaborating to create a series of courses on energy that students from these colleges can apply towards their graduate degrees.

*For complete overview see Exhibit E: Resources within Boston University.*
During the NEMI Advisory Committee meeting on April 16th, it was proposed that MET aim to launch a Graduate Certificate using existing courses from Project Management, City Planning and Urban Affairs, and one new course, by the fall of 2010. A number of next steps were outlined for various people and departments:

<table>
<thead>
<tr>
<th>Task</th>
<th>Person Responsible</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talk to faculty chairs for volunteers for a program committee</td>
<td>Tanya</td>
<td>Complete</td>
</tr>
<tr>
<td>Work with Bill Reed to develop course on Ecology/Living Systems/Sustainability</td>
<td>Enrique</td>
<td>Spring/Summer</td>
</tr>
<tr>
<td>Get curricula for Harvard Extension, Lesley, San Diego State, ASU, UVM and Brandeis programs for Tanya to share with Program Committee</td>
<td>Katie</td>
<td>Immediately</td>
</tr>
<tr>
<td>Mystery shop existing programs (above)</td>
<td>Katie and Kat and others</td>
<td>Spring/Summer</td>
</tr>
<tr>
<td>Google key word search/volume</td>
<td>Roxolana</td>
<td>Spring/Summer</td>
</tr>
<tr>
<td>Monitor success of CPE’s LEED course: where are students/instructors coming from?</td>
<td>Ruth Ann</td>
<td>This spring</td>
</tr>
<tr>
<td>Collect feedback from Gary Nicksa, Dennis Carlberg and BU Sustainability Committee members</td>
<td>Bob</td>
<td>Immediately</td>
</tr>
<tr>
<td>Conduct Focus Groups, gather more feedback from Linked In</td>
<td>Marketing</td>
<td>?</td>
</tr>
<tr>
<td>Conduct other market research to further determine demand for program</td>
<td>Marketing</td>
<td>?</td>
</tr>
<tr>
<td>Continue to attend relevant industry events on topic of sustainability and energy</td>
<td>Outreach</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Create and maintain contacts with industry and government leaders to cultivate relationships that may lead to enrollment generation when a new program is launched</td>
<td>Outreach</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Connect with ENG, SMG and GRS about the courses they are developing on Energy</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>Create Advisory Board with alumni industry and government contacts to help shape program content</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>Explore Grant-Funding opportunities</td>
<td>?</td>
<td>?</td>
</tr>
</tbody>
</table>
## Exhibit A: Research Sources

### Conversations and Interviews, December 2008-February 2009
- **Rick Dimino**, CEO, A Better City
- **Ted Barton**, Principal, Epsilon Associates
- **Jim Hunt**, Chief of Energy and Environmental Services, City of Boston
- **Kurt Gaertner**, Director of Urban Sustainability at the Mass Executive Office of Energy and Environmental Affairs.
- **Michael Gevelber**, Associate Professor in Manufacturing Engineering

### Greenbuild Conference, November 2008
*Attended lectures and had conversations with the following people:
- **Van Jones**, Founder and President of Green for All
- **Mark Aronson**, Business Development Manager, Constellation Energy
- **Jill Santopietro**, Talent Manager, CB Richard Ellis
- **Randi Gruber**, Marketing Group, Gale International
- **Phil Sauer**, Education Program Administrator, Energy Center of Wisconsin

### MIT Symposium on Sustainable Energy Technology in Germany and the U.S., December 2008
*Attended lectures delivered by the following people:
- **Colleen Soden**, Green Roundtable
- **Professor Elmar Bollin**, Director of Research Group NET-Sustainable Energy Technologies, University of Applied Sciences, Offenburg
- **Dietrich Schneider**, Senior Scientist, University of Applied Sciences, Stuttgart
- **Oliver Baumann**, President, Ebert and Baumann Consulting Engineers

### UCEA Workforce Development Conference, January 2009
*Attended lectures and had conversations with the following people:
- **Patricia Malone**, Director of Corporate Training and Education, Office of the Vice President for Economic Development, Stony Brook University
- **Debra Rowe**, President, US Partnership for Education for Sustainable Growth
- **Sharon Hanna West**, Exide Distinguished Lecturer of Ethics and Sustainability, University of South Florida
- **Anthony Joseph**, New York State Department of Labor
- **Wendy Evers**, Senior Director of Program Development, San Diego State University, College of Extended Studies
**Studies**

Prepared by Global Insight for the United States Conference of Mayors and the Mayors Climate Protection Center

*Green Collar Jobs in the U.S. and Colorado*
Prepared by Management Information Services for the American Solar Energy Society
January 2009
[www.ases.org/greenjobs](http://www.ases.org/greenjobs)

*Massachusetts Clean Energy Clean Energy Industry Census*
Prepared by Global Insight for the Massachusetts Technology Collaborative
August 2007

**Job-Seeking Web sites**

[http://www.masstech.org/renewableenergy/employ_links.htm](http://www.masstech.org/renewableenergy/employ_links.htm)
[http://www.energyplacement.com/jobs/renewable_energy_jobs_alternative](http://www.energyplacement.com/jobs/renewable_energy_jobs_alternative)
Exhibit B: Overview of “Green” Industry

I. Wind Energy Jobs

As the industry grows and matures the demand for technical expertise is being extended to expertise in the softer areas such as PR, community liaison, environmental impact, etc. The sector offers capable and energetic individuals vast potential to succeed in an industry which is growing faster than any other. The international nature of the wind industry means that individuals with additional language skills are especially valued.

Getting a Job in Wind Energy

There are an increasing number of specialist employment areas within the Wind Energy sector. Whilst many vacancies require an engineering background, many other good opportunities are available for individuals who may lack direct experience within the wind power sector, but who have enthusiasm and sought-after transferable skills.

Wind Energy Related Employment

Financial & Legal
- CEOs
- Finance Directors
- Senior Accountants
- Business Development
- Legal Advisors
- Investment advisor

Wind Farm Development
- Wind Farm Development Managers
- Off-shore expertise
- Project Mangers
- Technical Directors
- Engineering
- Grid Connection

Wind Resources
- Resource Analysis
- Micrositing
- Wind Farm Software modeling

Planning Consents
- Policy
- EIAs
- Environmental Monitoring
- Planning Regulations
- Community Relations

Turbine Manufacture
- Turbine R&D
- Towers and Nacelles
- Control Systems
- Quality Control

Non-technical
- Sales
- Communications
- Marketing
- Public Relations
- Human Resources

II. Green Building Employment Opportunities

The adoption of micro-renewables, and software packages to aid the design and management of energy systems within buildings, has created new job opportunities. There is a demand to fill positions such as Energy Manager, Energy Control Systems Engineer and for individuals adept at computer modeling, or installing and commissioning of solar, wind and other micro-renewables technologies.
Sustainable Planning
Facilitating this change in architectural practices are the layers of local, national and international regulations that must be designed, implemented and controlled. Each of these tiers requires knowledgeable staff to successfully drive sustainability standards upwards. At the strategic level, planners must be aware of the need to integrate energy generation and supply with sustainable transport, waste and water management systems into the residential and commercial elements of urban and rural areas.

**JOB AREAS:**

<table>
<thead>
<tr>
<th>Green Building</th>
<th>Planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Design</td>
<td>Building Standards</td>
</tr>
<tr>
<td>BREEAM, LEED standards</td>
<td>Planning Strategy</td>
</tr>
<tr>
<td>Ecological Design</td>
<td>Environmental</td>
</tr>
<tr>
<td>Sustainable Materials</td>
<td><strong>Energy Efficiency</strong></td>
</tr>
<tr>
<td>Construction</td>
<td>Thermal Insulation</td>
</tr>
<tr>
<td><strong>Micro Renewables</strong></td>
<td>Energy control systems</td>
</tr>
<tr>
<td>Solar Water</td>
<td>District Heating systems</td>
</tr>
<tr>
<td>PV</td>
<td><strong>Engineering</strong></td>
</tr>
<tr>
<td>Micro-wind</td>
<td>Energy Management</td>
</tr>
<tr>
<td>Heat Pumps</td>
<td>Project Management</td>
</tr>
<tr>
<td>Grid Tie</td>
<td>CAD</td>
</tr>
<tr>
<td>Inverter Systems</td>
<td></td>
</tr>
</tbody>
</table>

III. Solar Job Areas:


**Business & Financial**

<table>
<thead>
<tr>
<th>CEOs</th>
<th>Building integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finance Directors</td>
<td>PV Installers</td>
</tr>
<tr>
<td>Senior Accountants</td>
<td><strong>Solar Powered</strong></td>
</tr>
<tr>
<td>Business Development</td>
<td>Vehicles</td>
</tr>
<tr>
<td>Investment advice</td>
<td>Aircraft</td>
</tr>
<tr>
<td><strong>Solar Thermal</strong></td>
<td>Consumer goods</td>
</tr>
<tr>
<td>Domestic Hot water</td>
<td>Buildings</td>
</tr>
<tr>
<td>solar cooking</td>
<td>Communities</td>
</tr>
<tr>
<td>Passive solar</td>
<td><strong>Non-technical</strong></td>
</tr>
<tr>
<td>Solar pumps</td>
<td>Sales</td>
</tr>
<tr>
<td><strong>PV systems</strong></td>
<td>Communications</td>
</tr>
<tr>
<td>Grid tied inverters</td>
<td>Marketing</td>
</tr>
<tr>
<td>Battery systems</td>
<td>Public Relations</td>
</tr>
<tr>
<td>System Design</td>
<td>Human Resources</td>
</tr>
</tbody>
</table>
IV. Energy Finance
http://www.greenenergyjobs.com/career-guide/energy-finance-jobs/

There are many specialist areas within the financial sector of the renewable energy industry. The expansion and internationalization of the global energy markets, combined with the varied green energy certificate schemes and offset mechanisms provides roles ranging from those concerned with half-hour pricing to long-term forecasting. Beyond the skills and experience required within energy trading there is demand for financial acumen needed to assist companies in their business growth. New companies must navigate through the risks of business growth as well as their need for services in day to day financial management and accountancy practices.

V. Carbon Management Job Areas:
http://www.greenenergyjobs.com/career-guide/carbon-management-jobs/

Carbon Audits
Energy Efficiency
Micro Renewables
Sustainable Procurement
CHP
Waste Management

Energy Management
Building Assessments
Energy Control software

Emissions Offsetting
Emission Trading
Renewable Energy Certificates
Climate Change Policy

Carbon Sequestration
CO2 burial
Sequestration in Biomass
Exhibit C: Green Jobs Examples

Key qualifications have been italicized and highlighted in yellow

1. Director of Energy Management Services
   Nexamp, Inc. North Andover, MA

Position Summary
Nexamp is seeking a Director, Energy Management Solutions, to lead and build all aspects of our energy management business line, including the design, integration, and financing of energy efficiency solutions. Nexamp is an energy and carbon reduction systems integrator. We deliver a broad range of turnkey solutions that reduce energy consumption and carbon emissions for businesses, governments, and homeowners. We are seeking bright and enthusiastic professionals to join our highly motivated and effective team. For more information: www.nexamp.com.

Qualifications
Ideal candidate must be bright, enthusiastic, self-motivated, results-oriented, and a team player. The candidate should be a technical expert in energy management services, and related audit, design, integration, operational, and cost issues. The candidate also should have significant experience at a leadership level in the sale and delivery of energy management solutions to large energy users. 5 plus years experience in energy engineering or energy management services management. 4 year degree in engineering. Advanced degree in business or engineering preferred.

Required Skills. Excellent management experience, written and verbal communication skills, and proficiency with CAD, MS Word, Excel, and PowerPoint
Preferred Skills. Certified Energy Manager (CEM), and/or Certified Energy Auditor (CEA).

2. Solutions Development Leader (Renewable Energy)
   Johnson Controls

Job Responsibilities:
- Be the Regional "Champion" for Renewable Solution Development, and insure that a Renewable component is included with any applicable opportunity within the Region.
- "Regionalize" our Renewables Message of Value (MOV) and Renewables Strategy to the specific local markets.
- Work with Sales and potential customers to help qualify customer needs, and potential Johnson Controls Renewable Solutions.
- Provide coordination of preliminary analysis and development of customer business case for proposed Renewable Solution.
• Network with the National Renewables Team, and other Renewable SDLs to document and leverage best practices.
• Establish local exposure for Johnson Controls as a player in the Renewables marketplace (speaking, networking, training, etc.)
• Provide "Opportunity Targeting" efforts for the Region focused on potential Renewable opportunities (i.e. LFG to Energy, etc.)
• Provide follow on Regional training to Sales and Development on Renewable Solutions.
• Establish the Regional database for the Renewables incentives at Federal, State, and Local level. Provide influence where possible.
• Take ownership for the Renewables sales plan for the Region, and be the reporting contact.

Qualifications
Bachelor's degree in engineering, business or a related field, MBA desirable. Requires 10+ years of engineering, construction, and facility operations, with excellent knowledge of building-related systems and services. Experience in Renewable Solution Development. Broad understanding of all Renewable offerings (Biogas/Biomass, Wind, Solar, Geothermal, Sustainable design). Possesses an advanced understanding of Johnson Controls capabilities and the conceptual skills to solve important customer problems through a combination of Johnson Controls capabilities. Must have solid knowledge of the regulatory, legislative and business environment around Renewable Solutions. Possesses strong project management skills for managing large development projects with diverse resources. Excellent presentation and communication skills required. Strong conceptual skills required for developing innovative solution designs. Has excellent customer-facing skills and is comfortable presenting at the C-level. Strong team leader, able to quickly assemble and manage a solution development team as required. Has excellent business analysis skills used to create compelling business cases. Possesses solid working knowledge of common computer applications (e.g., MS Word, MS Excel, MS PowerPoint, MS Project, etc.). Ability to travel up to 50%, primarily within Region.

3. Head of Energy Management, Acre (UK)
You will be tasked with the creation and implementation of the company's energy/CO2 strategies. This will involve solving complex problems to deliver on strategic targets for energy and greenhouse gas performance. In addition you will:
• Identify strategies to make a cultural shift in the way the business views and manages its energy agenda
• Own and deliver the significant energy budget (one of the largest of its kind anywhere in the world), taking P&L responsibility
• Review new and existing building energy technologies and their application within the energy strategy
• Manage a team of 15 and up to 30 additional consultants
• Create excitement and passion with in the company that will allow the delivery of energy and emissions targets

To be a success in this high profile role you will be a leader within the field of energy management with the credibility to inspire people right up to Board level on energy and environmental issues.

You will be passionate about optimizing energy consumption and will have a proven ability to solve the complex problems large, multi-site organizations face to increase energy efficiency while maintaining a commercial focus. You will have experience of:

• Overseeing the design of significant and complex energy infrastructures
• Managing cost and program accountability of significant R&D programs
• Managing cost and operational accountability of energy management including the processes and systems which support this
• Process and technology improvement techniques (Root cause analysis, FMEA, HAZOP)
• Controlling of large budgets

4. Sustainability Manager, Cabarrus County Government

Qualifications:

Requires graduation from an appropriately accredited College or University with major course work in business administration, public administration, environmental science, engineering or a related field and 2 years experience; an equivalent combination of education and experience may be considered.

Thorough knowledge of sustainability theories as well as local, national, and global sustainability initiatives and best practices; excellent oral and written communications skills; strong skills and a track record for sustained measurement of program outcomes; general knowledge of EPA, NCDENR, OSHA, and NFPA regulations; knowledge of LEED certification programs; skill in analyzing information, problems, situations and procedures; ability to identify concerns and formulate logical and objective conclusions and analyze technical content; knowledge and skill in word processing, spreadsheet, calendaring, Microsoft Word, Excel, Outlook, PowerPoint, web authoring tools and database development and/or maintenance; ability to work independently and to establish and maintain effective working relationships with associates.

5. Environmental Sustainability Analyst
Sony Pictures Entertainment, Culver City CA

Sony Pictures Entertainment (SPE) is creating a new position to assist in meeting their environmental stewardship program, energy initiatives, and carbon reduction projects. Under the guidance of the Director, Environmental Sustainability, the Analyst will be instrumental in implementing and monitoring SPE’s overall environmental strategy with a
specific focus on decreasing environmental impacts within their worldwide operations.

Responsibilities:
• Manage the day to day operation of our SPE Environmental Website
• Perform cost benefit analysis for employee suggestions on how to improve environmental performance
• Track new and existing federal, state and district air regulations, and manage programs for their implementation
• Compile energy, water and waste reports on a regular basis to demonstrate organizational progress to management. Familiarity with energy intensity and carbon emission factors is a plus
• Manage carbon offset database and data entry tools, including interfacing with vendors and consultants
• Support team leaders involving a wide range of environmental stewardship projects
• Assist with planning virtual web based seminars and programs to support initiatives
• Analyze and understand complex production and/or manufacturing processes
• Provide sustainability training and support for a broad range of employees
• Recognize and phase out activities and/or practices that are not consistent with the company's environmental policies
• Support Green Teams operating across the organization

Skills:
• Strong analytical, data reporting, and problem solving skills
• Detail oriented, organized, and able to manage multiple tasks simultaneously
• Exceptional written communication skills
• Strong follow-through capabilities
• A passion for the environment

Experience:
• 2 - 5 years of experience in environmental project management strongly preferred; recent graduates with strong academic records in a relevant discipline will be considered
• Knowledge of building systems, energy efficient technologies, green building and high performance design is a plus
• Understanding of strategic marketing and market analysis techniques is a strong plus
• Experience with modeling techniques related to energy or environmental planning is a strong plus
• Understanding of programs such as Energy Star, LEED certification, and other standards for leadership is a strong plus
• Experience with project budgeting and cost tracking preferred
• Experience preparing written materials (presentation and reports) for executive review
• Public speaking experience
• Event planning experience
• Experience with Microsoft Excel and data analysis required
• Powerpoint, Visio, Sharepoint is a plus
Education: Bachelor's degree in natural or applied science is required.

6. Product Manager, Renewable Energy & Conservation Programs  
Washington Gas Energy Services  
Herndon, VA

Washington Gas Energy Services, Inc. (WGES), is a subsidiary of WGL Holdings, and is an affiliate of a company that has served the Washington metropolitan area for over 150 years, Washington Gas. WGES is the leading competitive retail energy marketer in the mid-Atlantic region and focuses on selling natural gas and electricity, including wind-powered electricity, to both commercial and residential customers. Recently, WGES partnered with a local solar energy company and electrical construction firm to build one of the largest solar power systems in Maryland.

Position Overview:

We are seeking an experienced professional to manage the Company's CleanStepsSM Conserve program. CleanStepsSM Conserve is a program designed to help energy consumers take action in decreasing energy usage in their homes.

Responsibilities:

The CleanStepsSM Conserve manager will lead these efforts by:

- Supporting the development of a newly introduced Product for residential customers, "CleanStepsSM Conserve". The product/service life cycle of CleanStepsSM Conserve includes a Home Energy Review, a report to customers, referrals to a network of energy efficiency home improvement contractors and the sales of energy conservation products.
- Coordinating the operations related to CleanStepsSM Conserve. Manage product/service sourcing and delivery capabilities, either in-house or contracted. Ensure optimal quality including evaluation, certification and quality assurance of contractors.
- Supporting activities to deliver optimal pricing and quality of CleanStepsSM Conserve services and products, including contract management.
- Coordinating and support activities related to improvement of data acquisition and analytics software of the Home Energy Review.
- Traveling within the WGES geographical footprint (VA, DC, MD, and DE).

Qualifications:

To be successful in this position you will need to have:
• 7 years of successful experience supporting environmental conservation program(s) or products, and 5 years of direct experience in energy efficiency.
• 3 years of experience working with or supervising contractors.
• BA/BS degree in Environmental Science, Engineering, Energy Management, or other technical/scientific college degree.
• Demonstrated expertise and certification in Energy Audits (example BPI) and/or energy software packages.
• Excellent communication skills both verbal and written.
• Excellent quantitative, analytical and technical skills

**Compensation:** If you want a casual, yet professional environment with a company that offers a competitive compensation package including excellent salary, bonus program, benefits package, 4 weeks paid vacation plus up to 2 weeks sick leave, a generous tuition reimbursement program, and a commitment to professional development and work/life balance, then this is the company for you!

7. Office of Sustainability Manager
City of Tacoma
**Categories:** Admin/ Gen Mgmt/ CSR/ Envir Mgmt Systems/Program Management
**Skill Level:** Senior Level
**Position Type:** Full Time

The City of Tacoma is seeking a Sustainable Development Manager with proven ability and understanding of sustainability theories as well as local, national and global sustainability initiatives and best practices and experience developing and executing creative plans and programs converting an organization and community such as the City of Tacoma to be more sustainable.

**Responsibilities:**
The Sustainable Development Manager will be responsible for working with senior management to balance the City's commitment to manage environmental impacts while efficiently and effectively providing city services to Tacoma citizens; planning and implementation of 5 and 10 year sustainability goals for City government and the community; refinement and implementation of the City of Tacoma's Climate Action Plan; implementation of plans and actions that integrate sustainability and environmental values into City plans, programs and policies; collaboration and coordination with the Tacoma Public Utilities sustainability activities; establishing relationships with other state, local, national and international entities, and provide ongoing advice to the City Manager and the Senior Management Team on the direction and work of the Office of Sustainability.

**Qualifications:**
Bachelor's degree in business, public administration, communication, organizational systems, environmental or political science or related field and 5 years of progressively responsible experience implementing sustainability programs, or programs in a related field such as environmental or resource management or project management
Exhibit D: Competitive Program Scan

I. Sustainability Misc.

Brandeis University Heller School of Social Policy and Management
- M.A. in Sustainable International Development
  http://www.heller.brandeis.edu/sid/programs_ma.htm#define

San Diego State
- Professional Certificate in Green Energy and Solar Management (online)
  www.ces.sdsu.edu/green_energy.html
- Professional Certificate in Green Building Construction (online)
  www.ces.sdsu.edu/construction.html

Arizona State University School of Sustainability
- Master of Arts in Sustainability
  http://schoolofsustainability.asu.edu/prospective/degrees/program_MA.php
- Master of Science in Sustainability
  http://schoolofsustainability.asu.edu/prospective/degrees/program_MS.php
- Interdisciplinary Graduate Certificate Program in Transportation Systems
  http://design.asu.edu/transportation/index.shtml

Consortium for Education in Renewable Energy Technology
- Certificate in Renewable Energy Technology (online) www.ceret.us

Baldwin Wallace College
- Undergrad Major in Sustainability (on campus)
  http://www.bw.edu/news/sustainmajor/

University of Vermont Institute for Global Sustainability
- Professional Certificate in Sustainable Business
  http://www.uvm.edu/~sustnbu/
- Green Building and Community Design
  http://learn.uvm.edu/igs/green_building
- Ecological Economics
  http://learn.uvm.edu/igs/ecological_economics

II. Business Degrees

UC Denver Business School
- Global Energy Management Master’s Degree Program (hybrid-online)

University of South Florida College of Business
- MBA Emphasis in Sustainable Business (on campus)
  http://cob.sfsu.edu/cob/graduate-programs/sustainable.cfm

Anaheim University
- Green MBA (online) http://www.anaheim.edu/content/view/638/704/
- Diploma in Sustainable Management (online)
  http://www.anaheim.edu/content/view/611/658/
- Certificate in Sustainable Management (online)
  http://www.anaheim.edu/content/view/610/657/

Vienna University of Economics and Business Administration
- Professional MBA in Energy Management
  http://www.executiveacademy.at/pmba_em

III. Environmental Studies

Harvard Extension School
- Master of Liberal Arts in Environmental Management (on campus and online courses)
- Certificate in Environmental Management (on campus and online courses)
  http://extension.harvard.edu/2008-09/courses/envr.jsp#e-101

Montclair State University
- Master of Arts degree in Environmental Studies-Environmental Management (on campus)
  http://www.montclair.edu/GradSchool/programs/masters/env3.shtml

UC Davis Extension School
- Land Use and Environmental Planning Certificate Program
  http://extension.ucdavis.edu/unit/land_use_and_natural_resources/course/listing/?unit=LUNR&prgList=EPL&coursearea=Environmental+Planning

IV. Urban Planning/Public Policy

Tufts Graduate School of Arts and Science
- Master of Arts in Urban and Environmental Policy and Planning (on campus; 12 courses; part-time or full-time)
  http://ase.tufts.edu/UEP/Degrees/MA.aspx
  Sample Concentration options:
  - Sustainable communities
  - Environmental justice and brownfields
  - Community development and housing
  - Land use and growth management planning
  - Regional and metropolitan planning
  - Natural resource policy
Science/technology, ethics, and environmental policy
- Environmental risk
- Corporate responsibility and the environment
- Climate change/green building
- International environmental policy
- Environmental education and communication

- Master of Public Policy (on campus, 9 courses part-time or full-time)
  http://ase.tufts.edu/UEP/Degrees/MPP.aspx
- Certificate in Community Environmental Studies (on campus)
  http://gs.as.tufts.edu/1176473070088/GSAS-Page-gsas2ws_1176473070381.html
  Courses can be used towards the master’s degree in urban and environmental policy and planning.

MIT
- Master in City Planning with a Concentration in Environmental Policy and Planning
  http://web.mit.edu/dusp/epp/

Harvard Graduate School of Design
- Master of Urban Planning (can also earn a join MUP and Master of Public Policy)
  http://www.gsd.harvard.edu/academic/upd/mupprogramofstudy.htm

NYU Wagner Graduate School of Public Service
- Master of Urban Planning (on campus)
  Specialization: Environment, Infrastructure and Transportation
  http://wagner.nyu.edu/urbanplanning/spec_env.php

Columbia University
- Master of Public Administration in Development Practice (to launch Fall ’09)
  http://www.earth.columbia.edu/articles/view/2282
  http://mdp.ei.columbia.edu/sitefiles/file/Exec_Summary-Int%27l_Commission_on_Education_for_Sustainable_Dev_Practice.pdf

George Washington University College of Professional Studies
- Graduate Certificate in Sustainable Landscapes (on campus)
  http://cps.gwu.edu/landscape.html
  Can be used towards a Master’s of Professional Studies in Landscape Design

Arizona State University College of Design
- Master of Urban and Environmental Planning
  http://design.asu.edu/planning/graduate.shtml
- PhD in Environmental Design and Planning
  http://design.asu.edu/phd/index.shtml

UC Davis Extension School
- Green Building and Sustainable Design
  http://extension.ucdavis.edu/unit/green_building_and_sustainability/course/listing
V. Engineering

MIT
  o One Year Post Graduate Diploma Course in Energy Management (online)
    http://www.mitsde.com/energy_management.asp

Harvard School of Engineering and Applied Sciences
  o Master’s and PhDs in Environmental Sciences and Engineering (one area of
    research is Energy and Technology—the study of new, more efficient, and
    greener sources of energy)
    http://www.seas.harvard.edu/research/envirosciencesandengineering.html

UC Davis Extension School
  o Renewable Energy Systems
    http://extension.ucdavis.edu/unit/green_building_and_sustainability/course/listing/
  o Energy Resource Management Certificate Program
    http://extension.ucdavis.edu/unit/engineering_and_technology/course/listing/?unit=

George Washington University School of Engineering and Applied Sciences
  o MS or PhD in Environmental and Energy Management (on campus)
    http://www.emse.gwu.edu/focus/focus_eem.html

Duke University
  o Masters of Engineering Management. (on campus) http://memp.pratt.duke.edu/
    A one year program with 4 classes in business, law, entrepreneurship, and a 4
    class technical concentration with a required 3 month internship. The technical
    concentration can be anything from financial engineering to biomechanics. They
    have an Energy and Environment concentration that seems like something more
    like what we would structure the curriculum for the "Energy Management
    Studies" program.

UC Berkeley
  o The Energy and Resources Group (on campus, more focused on undergraduate
    education but group conducts research) http://erg.berkeley.edu/

NYIT
  o Master of Science in Energy Management (on campus and online)
    http://www.nyit.edu/pdfs/catalog/grad_etec.pdf
    This relatively new and rapidly expanding field combines expertise in
    management practices and strategies as well as the technical aspects of
mechanical and environmental engineering. Accredited by the Middle States Association of Colleges and Schools.

New Jersey's Science and Technology University

- Master of Science in Power and Energy Systems (evening and weekend courses available for those who want to pursue part-time)

NC State

- Energy Management Diploma Series (on campus or online)
  [http://continuingeducation.ncsu.edu/energymgt.html](http://continuingeducation.ncsu.edu/energymgt.html)
Exhibit E: Resources within Boston University

- **Collaboration among ENG, CEES and SMG to create series of courses that can be used towards MBA, Grad CEES and ENG programs.**
  Faculty contacts are:
  - Michael Gelvelber, Associate Professor, ENG
  - Robert Kaufmann, Director CAS Geography and Environment
  - Uday Pal, Division Head of Mechanical Engineering
  - Michael C Caramanis, Professor, Mechanical Engineering

- **MET Programs and Courses**
  - CPE—LEED course to begin this spring (Karen Murphy)
  - Enrique’s Culminating City Planning Course on Sustainability
  - Sam Mendlinger’s Eco-Tourism course
  - Project Management courses
  - Ginny Grieman’s International Development course proposal (this course proposal was developed to address the growing need for the teaching of the political, legal and financial challenges associated with the planning and implementation of large scale infrastructure, transportation, energy, technology and environmental projects both locally and internationally with a focus on developing countries.)

- **Boston University Sustainability Committee (Bob Schudy)**

- **BU Energy Club**

- **Greening the Campus website:** [http://www.bu.edu/green/index.shtml](http://www.bu.edu/green/index.shtml)

- **GRS: Energy and Environmental Studies**
  [http://www.bu.edu/cees/](http://www.bu.edu/cees/)

- **SED Green**
  [sedgreen@bu.edu](mailto:sedgreen@bu.edu)
  Douglas Zook [dzook@bu.edu](mailto:dzook@bu.edu)

- **School of Management courses:**
  **SP844: Competitive Environmental Strategy**
  There is little disagreement that environmentalism affects corporate management, which alters profit and loss statements and influences both domestic and international strategy. Yet, while many within industry and government are vilifying environmentalism as a threat to economic growth, others are taking advantage of the economic opportunities it can reveal. This course will consider how cutting edge companies are beginning to see environmental protection as a strategic opportunity rather than as a threat. While it focuses on environmental
issues in particular, the course is of interest to anyone concerned with understanding how new social issues are moving onto the corporate agenda. Students will learn how to identity emerging issues, frame and sell them to others in the corporation, and manage their integration.

**OM845: Clean Technology Business Models**  
The clean technology industry is touching some of the largest sectors of the economy and yet still undergoing significant growth and attracting a plethora of new entrants. It has been characterized by a great deal of experimentation around new technologies and around business models in the face of regulatory and market place disruptions. The course uses a combination of cases, simulation and analytical exercises to review trends and their co-evolution within the clean technology/energy eco-system. It aims to build a skill set around risk and opportunity assessment, and allied implementation challenges.

- **MS in Engineering—concentration in Energy and Thermo-Sciences**  
  [http://www.bu.edu/me/graduate/masters/index.html](http://www.bu.edu/me/graduate/masters/index.html)

- **MPH, Concentration in Global ecology, environmental sustainability, and health**  