Energetic About the Environment?: Careers in Clean Energy

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Forward in Energy

- Foster success of collaborative energy research projects
- Prepare energy leaders of today & tomorrow
- Provide energy solutions to the public, communities & industry
- Enhance public understanding of pressing energy issues

energy.wisc.edu
Outline

- Introduction to Clean Energy
- Clean Energy Sectors and Job Examples
- Resources and Advice
What Do We Mean by Clean Energy?

- Carbon-Neutral Energy Sources
  - Renewables: Wind, Solar, Geothermal, Bioenergy, Hydro
  - Nuclear?

- Energy Efficiency and Conservation
  - Reducing our energy usage in homes, businesses, factories, and transportation
Why Clean Energy?

- Do well by doing good
  - Climate change, pollution, sustainability

- Fast-growing sector:
  - Ex: One out of every 78 new jobs created in the U.S. over the past 12 months was created by the solar industry.
  - The solar industry is adding workers at a rate nearly 20 times faster than the overall economy.
  - But solar still counts for less than 1% of energy in U.S.
Four “Quadrants” of Clean Energy Leaders

• **Politicos**
  Students drawn to careers as politicians, policy advocates, lawyers, lobbyists, judges, activists- people who craft and advocate for a transformative clean energy public agenda.

• **Innovators**
  Students drawn to careers as engineers, scientists, inventors, entrepreneurs- people who discover and demonstrate the power of clean energy solutions.

• **Technicians**
  Students drawn to careers as builders, carpenters, mechanics, electricians, farmers, accountants- people who build and maintain the infrastructure of clean energy solutions.

• **Storytellers**
  Students drawn to careers as journalists, marketers, artists, musicians, filmmakers, teachers- people who capture, share and promote our new energy story.

Source: [http://focusthenation.org/](http://focusthenation.org/)
Employer Types in Clean Energy

- Electric Utilities
  - Alliant Energy, Madison Gas and Electric
- Construction/Installation Firms
  - Mortenson, Findorff, Boldt, Sun Peak
- Manufacturers
  - Johnson Controls, GE, Sunpower
- Energy Service Company (ESCO)
  - Wisconsin Energy Conservation Corp., Franklin Energy
- Consulting Firms
  - Navigant, DNV GL, CB&I
- Government Agencies
  - WI Public Service Commission, FERC, Dept. of Energy
- Non-Profits
  - Sierra Club, Environmental Defense Fund, RENEW Wisconsin
- Also plenty of startups (or start your own)!
Sectors in Clean Energy

- Sustainable Transportation
- Energy Saving Homes, Businesses and Manufacturing
- Low-Carbon Electricity
- Policy and Law
- Jobs that Transcend Sectors
Sustainable Transportation

- Bioenergy (sustainable fuels)
  - Biosciences
  - Engineering
- Vehicles (EVs, efficient engines)
  - Automotive Engineering (Electrical Engineering or Mechanical Engineering)
- Mass Transit (trains, buses, etc.)
  - Urban Planning
Energy Saving Homes, Businesses and Manufacturing

- Energy Efficiency and Demand Response Programs
  - Communications and Marketing
  - Data Analysis
- Manufacturing
  - Mechanical or Industrial Engineering
- Green Building
  - Civil Engineering, Real Estate
Low-Carbon Electricity

• Engineering
  – Designing and analyzing systems

• Construction
  – Planning and building systems
  – Environmental impact analysis

• Manufacturing
  – Materials, components, processes

• Financing and Markets
Policy and Law

- Policy Analyst
- Environmental Lawyer
- Environmental Advocate/Lobbyist
Jobs that transcend sectors

- Accountant/Economist/Financial Specialist
- Sales, Marketing and Communications
- IT
- Project Management/Development
Beyond the technical skills- what are good cross-cutting competencies?

• Good communication skills
• Ability to work with others across disciplines
• Systems thinking - being able to see how different parts affect one another in a system
• Numeracy – ability to put numbers into context
• Knowledge of industry – keep up with current events
### Figure 1: Employers rate the importance of candidate skills/qualities

<table>
<thead>
<tr>
<th>Skill/Quality</th>
<th>Weighted average rating*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to work in a team structure</td>
<td>4.55</td>
</tr>
<tr>
<td>Ability to make decisions and solve problems</td>
<td>4.50</td>
</tr>
<tr>
<td>Ability to plan, organize, and prioritize work</td>
<td>4.48</td>
</tr>
<tr>
<td>Ability to verbally communicate with persons inside and outside the organization</td>
<td>4.48</td>
</tr>
<tr>
<td>Ability to obtain and process information</td>
<td>4.37</td>
</tr>
<tr>
<td>Ability to analyze quantitative data</td>
<td>4.25</td>
</tr>
<tr>
<td>Technical knowledge related to the job</td>
<td>4.01</td>
</tr>
<tr>
<td>Proficiency with computer software programs</td>
<td>3.94</td>
</tr>
<tr>
<td>Ability to create and/or edit written reports</td>
<td>3.62</td>
</tr>
<tr>
<td>Ability to sell or influence others</td>
<td>3.54</td>
</tr>
</tbody>
</table>

*5-point scale, where 1 = Not at all important; 2 = Not very important; 3 = Somewhat important; 4 = Very important; and 5 = Extremely important

Source: Job Outlook 2014, National Association of Colleges and Employers
Resources and Advice

• Get Informed:
  – Take courses in energy (Intro: Physics 115)
  – Explore degree and certificate programs
  – Read the news

• Get Involved:
  – Student clubs (e.g. Energy Hub uwehub.org)
  – Internships
  – Research Experience
  – Competitions
Educational Programs at UW

- Certificate in Engineering for Energy Sustainability
  - Undergraduate certificate
- Energy Analysis and Policy Certificate
  - Graduate certificate
- Resource and Energy Demand Analysis
  - Accelerated Master’s degree
- Other programs with energy concentrations
  - Environmental Studies Major or Certificate
  - Sustainability Certificate
UW-Madison Academic Programs

Certificate in Energy Sustainability

Educational Materials

Education Programs

Event Blog

Certificate in Engineering Thermal Energy Systems

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Website: http://www.energy.wisc.edu/education/energy-certificate
energy.wisc.edu >> Resources >> For Students

- Research
- Careers
- Funding
- Competitions
Competitions

- Win up to $10k for your idea
- energy.wisc.edu/wesc
- (Deadline is in October, repeats annually)

- Compete against other colleges to design and deploy working turbine
- Team is filled for 2016, but may compete again in 2018
“Resources for Students” webpage

- [http://energy.wisc.edu/resources/for-students](http://energy.wisc.edu/resources/for-students)
- Job listings
- Links to other career resources, including:
  - DOE Clean Energy Jobs and Career Planning
  - My Energy Gateway
  - CareerOneStop Competency Models
  - Job boards
On getting a job

- Still an emerging industry
- Do a national search (especially for internships)
- First job may not be in clean energy, but ability to transfer (keep networking and researching)
- Do your research – find out about employers, network with alumni
  - Don’t ask them for a job, but ask them easier questions (how they got their job, skills needed)
- LinkedIn Search Activity
LinkedIn Search Activity

• Go to LinkedIn (create a profile if you haven’t already)
• Search for University of Wisconsin-Madison
• Click on “Explore Careers of 205,000 alumni”
• Enter keywords (e.g. energy)
• Filter by major, company, location, etc.
• Find one alumnus/a to contact
  – Ask for an informational interview or type up a set of questions
Questions?

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