Preparing a Modern US Energy Workforce

Ann Shikany and Craig Zamuda, Ph.D.
Office of Policy and International Affairs
U.S. Department of Energy

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Overview

"Competing in the new energy economy will require our country to harness all of our resources, including American ingenuity."

- Steven Chu, US Secretary of Energy

The Department of Energy recognizes that as the energy market grows it will require:

- Innovative technologies both clean and conventional
- The best minds, with specific technological skills
- A diversity of ideas and perspectives

In response, the Department of Energy will:

- Work with academia and industry
- Enable today's students to be a part of the clean energy transformation.

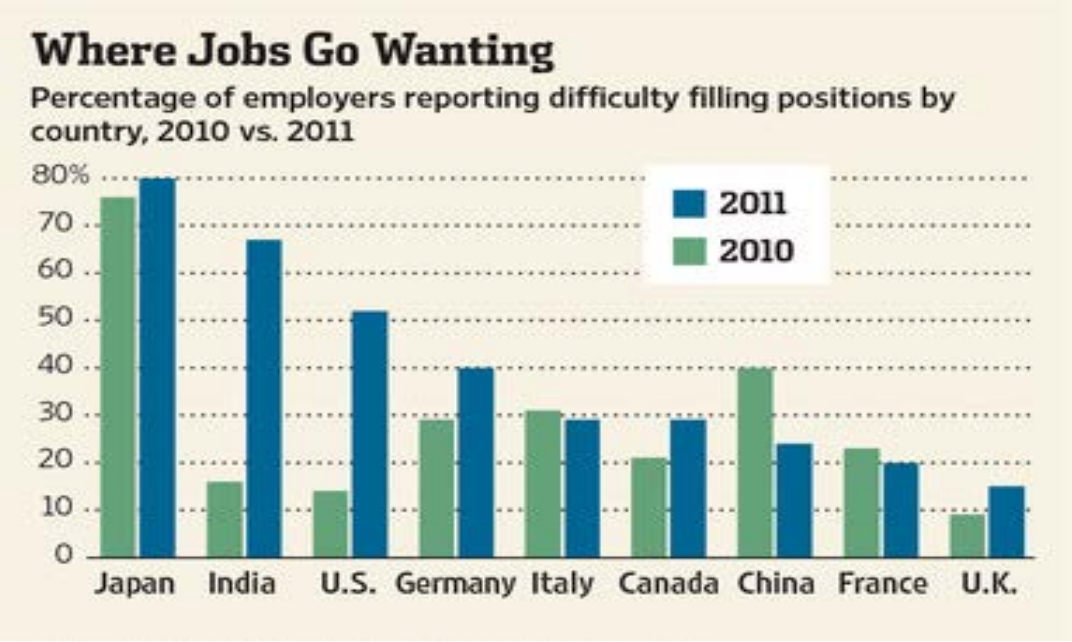
Department of Energy Priorities

- Catalyze the timely, material, and efficient transformation of the nation's energy system and secure U.S. leadership in clean energy technologies.
- Maintain a vibrant U.S. effort in science and engineering as a cornerstone of our economic prosperity with clear leadership in strategic areas.
- Both will require strategic efforts to build the energy technology workforce of the 21st Century

Workforce Challenge

- Many firms in energy efficiency and renewable energy are finding that they are not able to find people with skills matched to their new requirements. Retirements of skilled workers adds to the problem.

- President's Jobs Council: "Lack of alignment between what employers need and what skills are taught and delivered is becoming a critical problem for business and the nation." [2011 Year End Report, p. 13]



http://www.nsf.gov/statistics/seind10/c2/c2h.htm

Framing Questions

- *What are the human resource and educational requirements of energy enterprises in the global economy? How can they be identified?*
- *Do current educational programmes meet the needs of industry?*
- *How can industry work with educators to create stronger curricula?*

DOE Tools and Programs

- Energy Literacy and Information
- Internships and Fellowships
- Strategic partnerships with universities and industry
- Diversity inclusion programs

Energy Literacy and Information

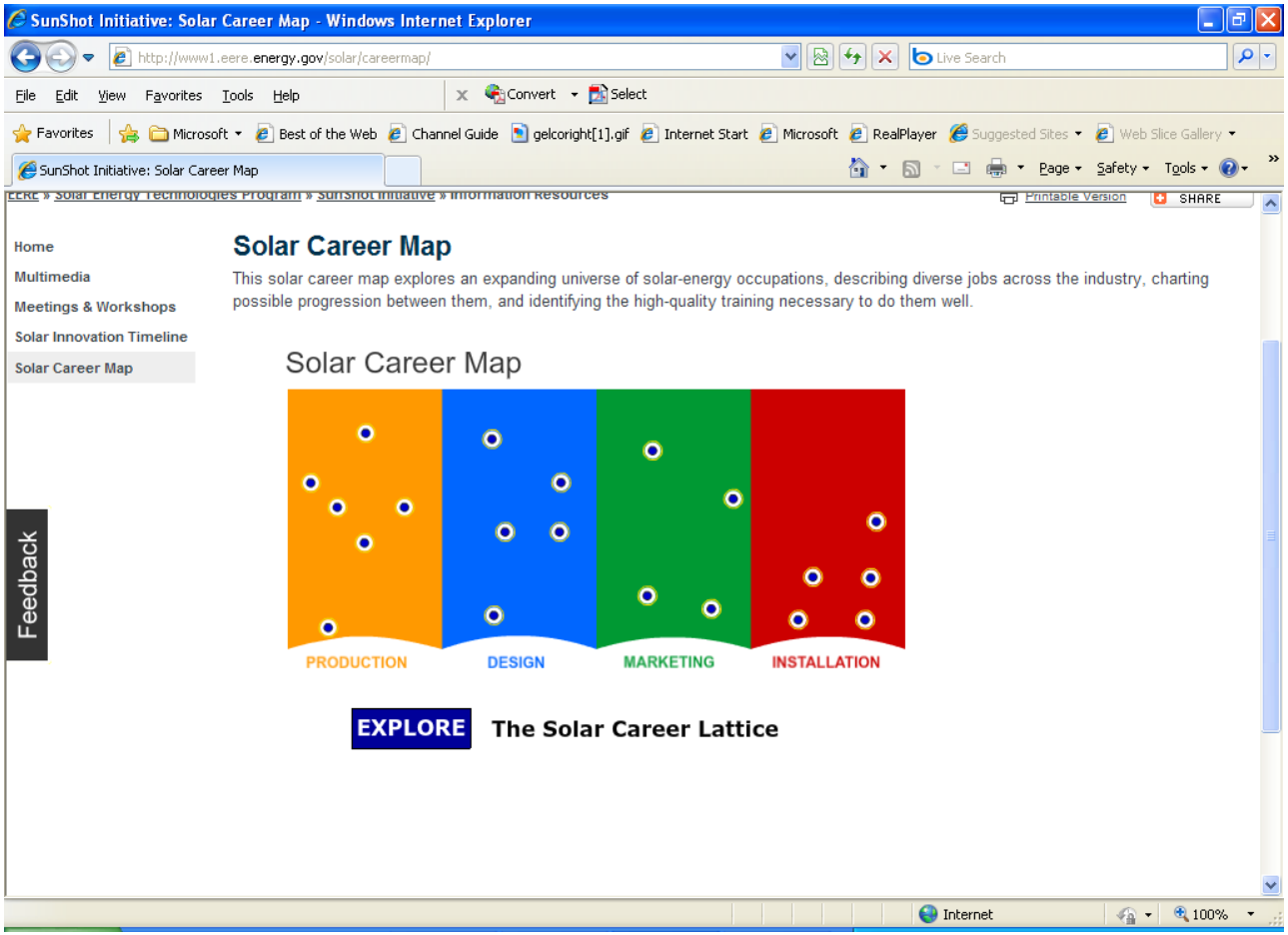
Energy 101

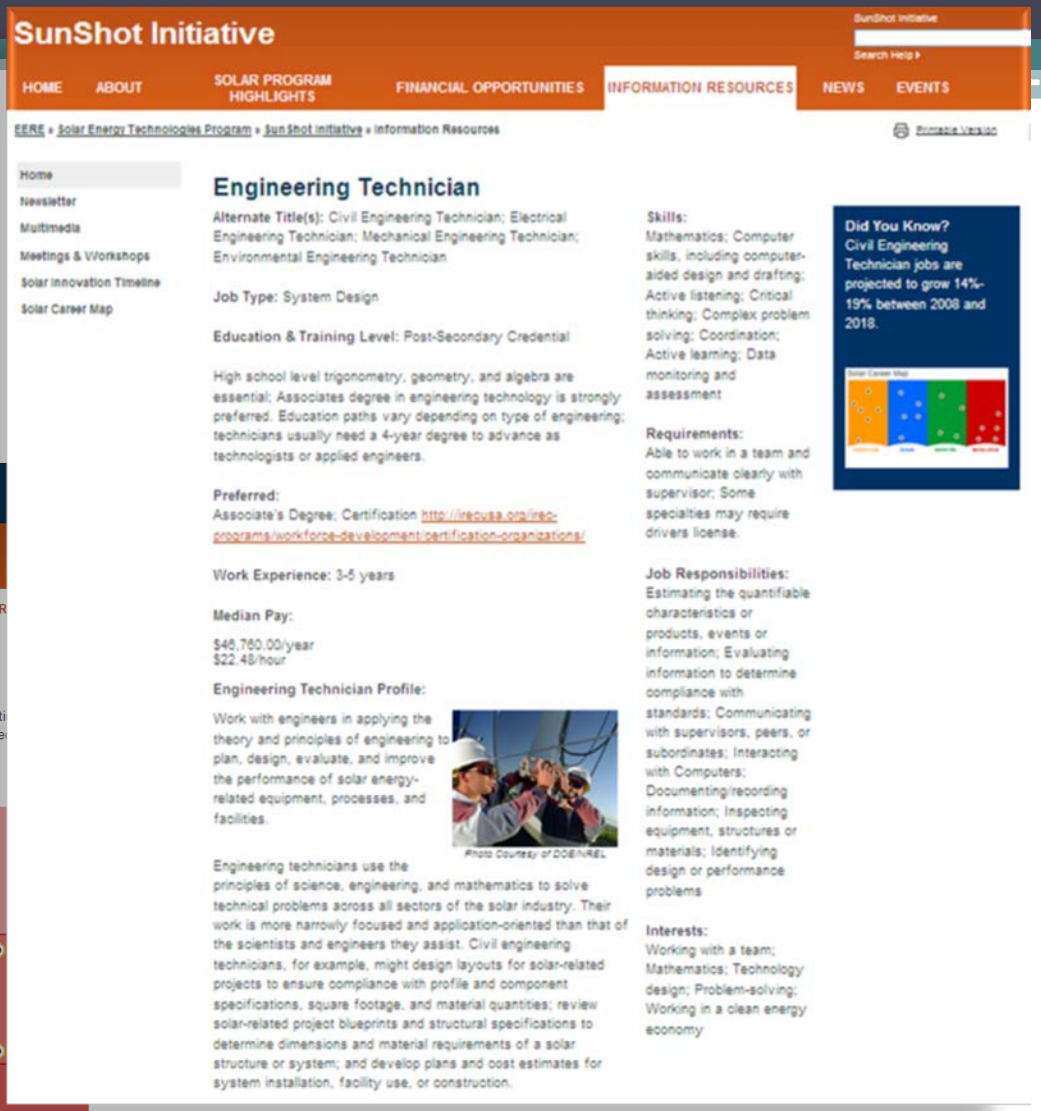
Creating a nationally recognized interdisciplinary general education energy course for community colleges and universities

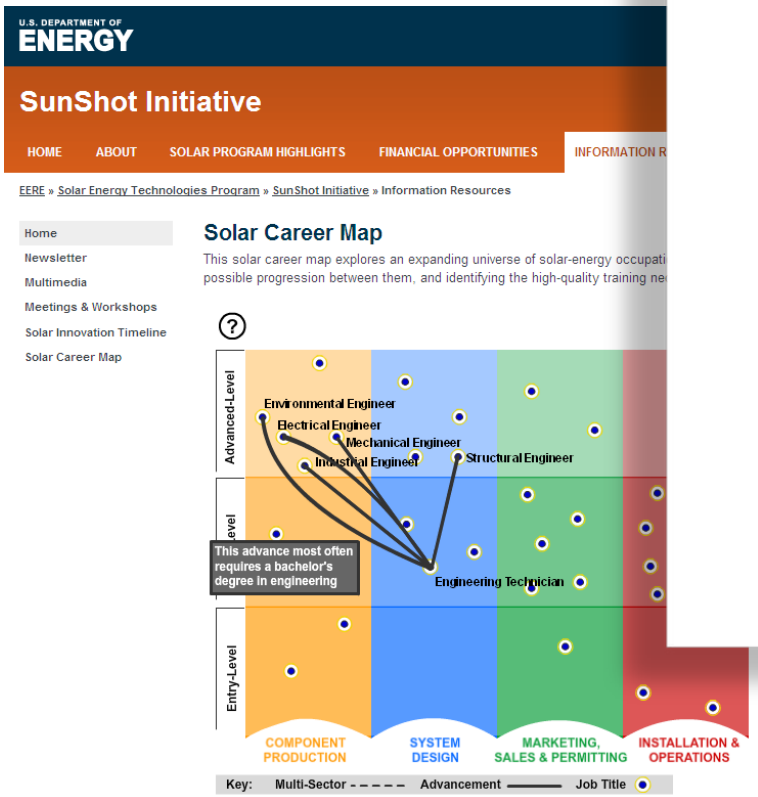
- DOE's Office of Energy Efficiency and Renewable Energy is supporting the development of an interdisciplinary energy course to meet different general education requirements across the country.
- Energy 101 use of the National Training and Education Resource (NTER), an open source tool for authoring and sharing course content using the latest web-based technology and interactivity
- Using NTER allows for the easy modification and customization of course to fit the needs of individual college or university

Energy Literacy and Information

Career Mapping Tools







"Job Details" for Engineering Technician.

Internships and Fellowships

Examples of Federal Level Programs:

- Presidential Management Fellowships
- Student Career Employment Program

Examples of DOE Specific Programs:

- The Science Undergraduate Laboratory Internship
- The DOE Office of Science Graduate Fellowship
- ARPA-E Fellows Program

Strategic Partnerships with Universities and Industry

Bringing academia and industry together through DOE's Innovation Hubs.

Energy Innovation Hubs are integrated research centers that combine basic and applied research with engineering to accelerate scientific discovery in critical energy issue areas. Each Hub fosters unique, cross-disciplinary collaborations by bringing together leading scientists to focus on a high priority technology.

Existing hubs are currently focusing on:

- Energy-Efficient Buildings System Design
- Fuels From Sunlight
- Nuclear Energy Modeling and Simulation

Innovation Hub: Greater Philadelphia Innovation Cluster (GPIC)

GPIC focuses Energy Efficient Buildings, specifically how to design, construct and retrofit commercial and residential buildings that are vastly more energy efficient than today's buildings .

It includes 11 academic institutions, two DOE laboratories, six high-profile global industry partners, regional economic development agencies, and community colleges. The hub's activities are organized and managed by five Task teams :

- Design Tools
- Integrated Technologies
- Policy, Markets & Behavior
- Deployment & Commercialization
- **Education & Workforce**

The Education & Workforce task is specific to this hub, but in general all the hubs bring members of government, academia and industry together, creating informal avenues of communication between partners.

Education & Workforce Task Team

Focus: developing skills for quality jobs at all levels in energy efficient building systems

Continuing Education Workshops

- Financing and Incentives for Energy Related Building Retrofits
- Energy Efficiency Opportunities for Commercial Office Tenants.

Education and Workforce Development Centers and Laboratories.

- Solar Installation Training
- Developing Fusion as an energy source
- Many Others

Reports:

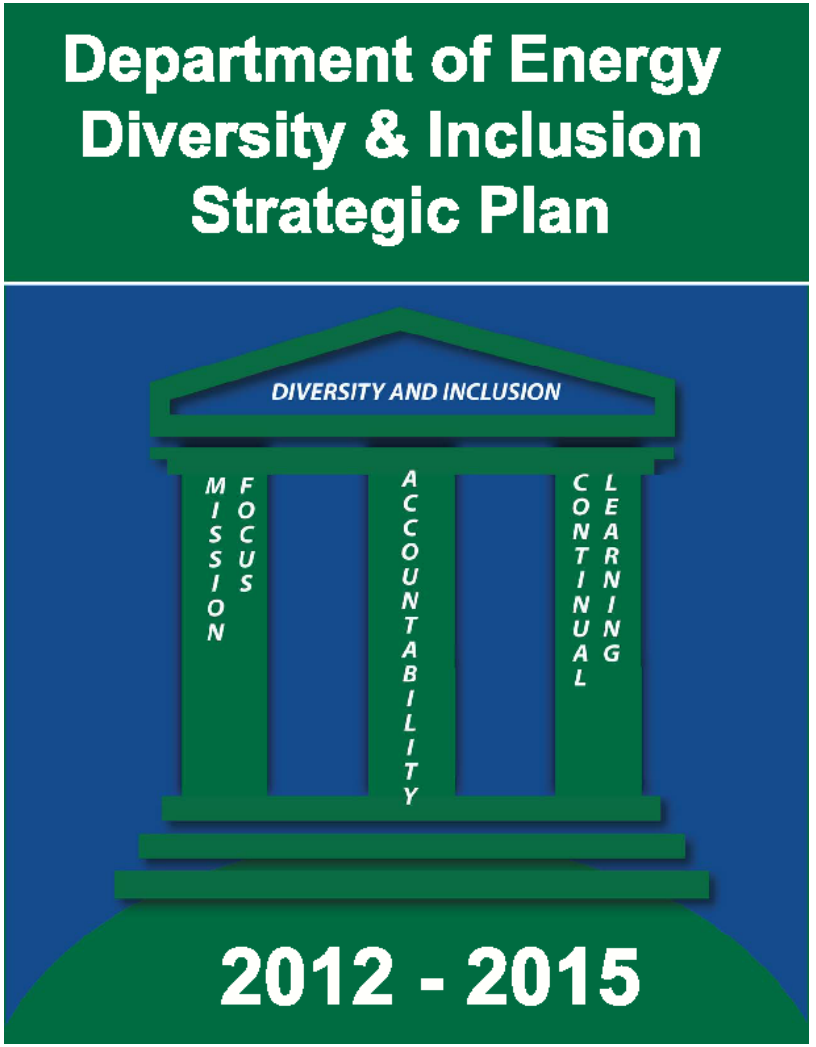
- Education and Workforce Programs Report
- Educator's Conference for Subject Matter Experts and Leaders

Diversity inclusion programs

President Obama signed an Executive Order "Establishing a Coordinated Government-wide Initiative to Promote Diversity and Inclusion in the Federal Workforce."

DOE's Vision statement:

DOE will capitalize on the diverse attributes of the Nation today to build an inclusive DOE for tomorrow. DOE will be the Federal government's model employer by leveraging diversity and inclusion to deliver the best public service on behalf of the Nation.



Clean Energy Education & Empowerment (C3E)

A Women's Initiative

The U.S. Clean Energy Education & Empowerment (C3E) program is an effort to advance the careers and leadership of professional women in the field of clean energy. It is led by DOE in strong partnership with MIT's Energy Initiative (MITei), and is composed of three core parts:

- **C3E Ambassadors** – corps of distinguished senior professionals committed to championing the initiative's success as spokeswomen and men and as mentors.
- **Awards program -** recognize mid-career individuals who advance the leadership and accomplishments of women in clean energy. Six awards will come with a cash prize of $10,000.
- **Symposium -** an annual professional conference including the awards ceremony and panel discussions on specific energy issues, with the larger aim of building a strong community of women in clean energy.

CLEAN ENERGY MINISTERIAL
Accelerating the Transition to Clean Energy Technologies

U.S. DEPARTMENT OF ENERGY

MITei

Lessons Learned

- **Information about education and jobs needs to be easily available and organized**. Federal programs are generally dispersed across the agencies and not consolidated in one place, making it challenging to discover and access them.

- **Students need to be inspired -** Even in a perfect system where a certain degree may lead directly to employment in energy careers.

- **Need to define the proper role of government, institutions, private sector**, etc., in addressing the workforce challenge and doing so in a collaborative manner is a work in progress.

- **Improved capabilities are required to characterize the needed talent pool** to accelerate energy technology research and innovation.

For Additional Information

Contact:

Ann Shikany
Office of Policy and International Affairs
US Department of Energy
1000 Independence Avenue, SW
202-287-6555
ann.shikany@hq.doe.gov
Or
Craig Zamuda, Ph.D.
Office of Policy and International Affairs
US Department of Energy
1000 Independence Avenue, SW
202-586-9038
Craig.Zamuda@hq.doe.gov