



U.S. Department of Energy's Role in Energy Efficiency and Renewable Energy Education and Workforce Development

July 27, 2011

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Biomass Program

Electric Power Generation

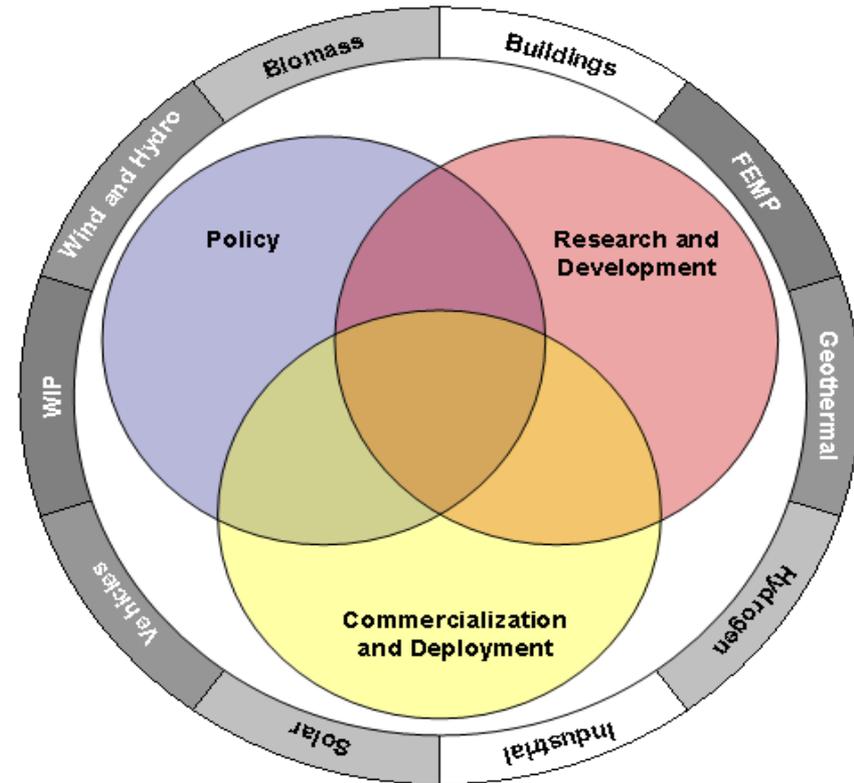
- Geothermal
- Solar
- Wind & Hydropower
- Hydrogen & Fuel Cells

Transportation

- Biomass
- Hydrogen & Fuel Cells
- Vehicles

Energy Efficiency

- Buildings
- Industrial
- Federal Energy Management
- Weatherization and Intergovernmental



Mission Statement

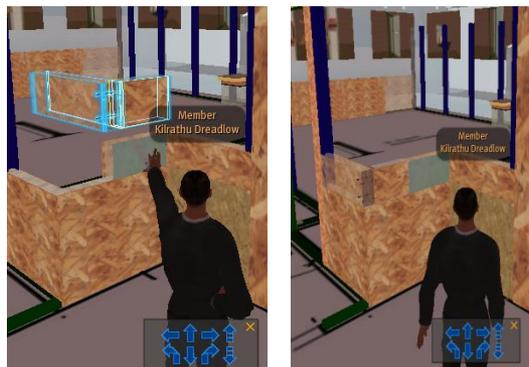
To develop cost competitive technology, facilitate commercialization and deployment to the marketplace



Education

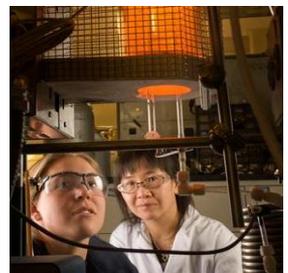


Training

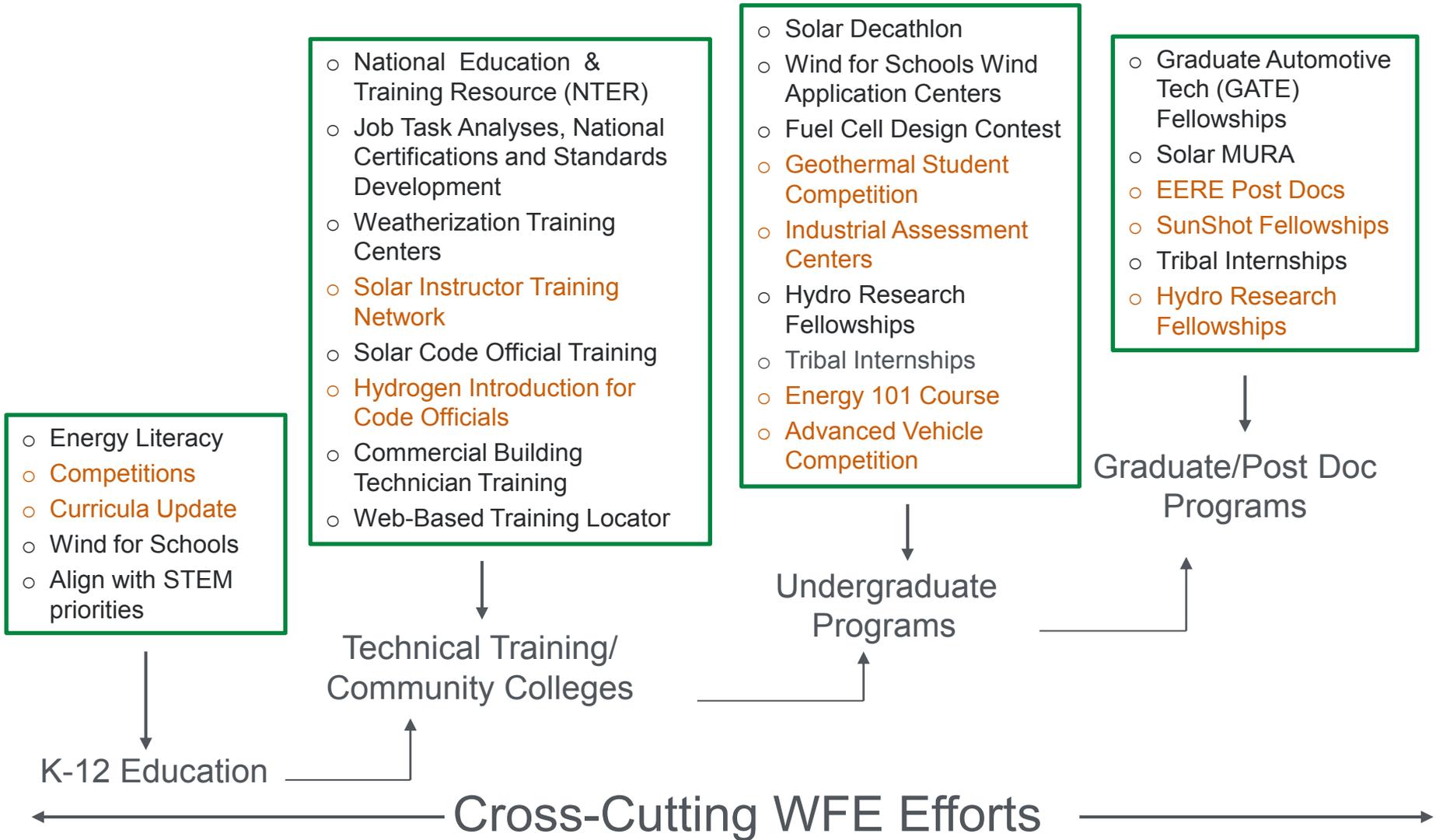


Advanced IT Learning

- EERE education and workforce highlights
 - Curriculum development
 - Competitions
 - Summer/extracurricular courses
 - Research fellowships
 - Training programs
- Objectives
 - Initiate discussion about what role DOE should play to foster bioenergy workforce development/education
 - Gauge different stakeholders' level of interest and obtain input on the extent to which DOE should explore some of these approaches to address identified needs



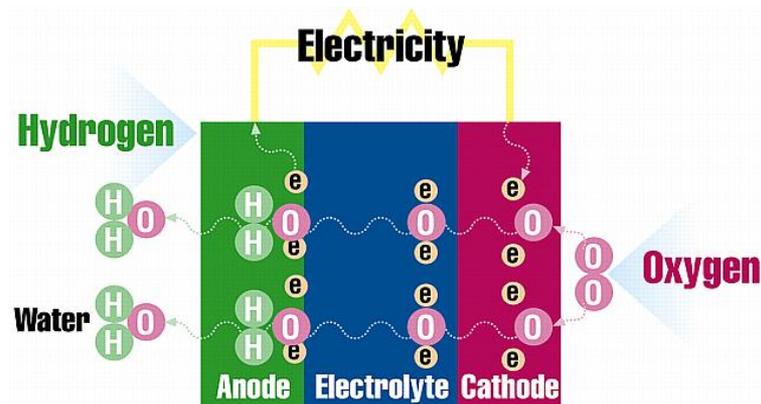
EERE Activities Across the Education / Training Pipeline



Web Site - Materials - Interagency Coordination - Outreach - Evaluation

Middle School: H2 Educate!

- Objective is to develop, design, and deliver a first-class, comprehensive middle school hydrogen education program that includes:
 - Training, classroom materials
 - Technical and best-practices exchange
 - Evaluation

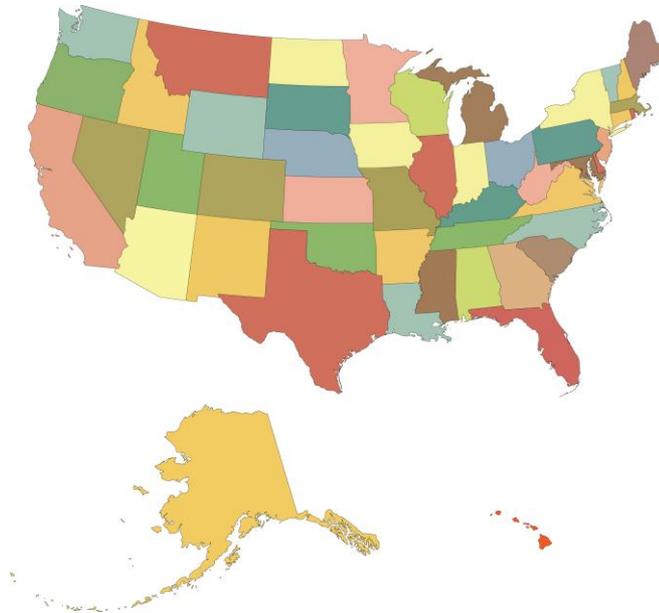


High School: Hydrogen Technical Education Curriculum (HyTEC)

- Curriculum module about hydrogen and fuel cells.
- Correlates to the National Science Education Standards and/or state and local standards to help ensure integration.

Energy 101

- Proposed university-level course that satisfies general education requirements
- On May 25, the Association of Public Land Grant Universities (APLU) convened an Energy 101 Summit in conjunction with DOE
 - DOE showcased soon-to-be released National Training and Education Resource (NTER) software platform



National Geothermal Academy (NGA)

- 8-week intensive summer course on geothermal energy development and utilization
- Available for undergraduate/graduate credit or professional development

Contributors to Consortium

University of Nevada – Reno

Oregon Institute of Technology

Southern Methodist University

Stanford University

University of Utah

Cornell University

University of MA – Dartmouth

West Virginia University

Industry

Courses

Dates

Introduction to Geothermal Energy Utilization

June 20-24

Public Policy, Permitting and Environmental Issues

June 20-24

Resource Assessment and Exploration

June 27-July 8

Drilling Engineering

July 11-15

Reservoir Engineering

July 18-22

Power Plant Design and Construction

July 25-29

Direct Use and Heat Pumps

August 1-5

Geothermal Business Principles and Development

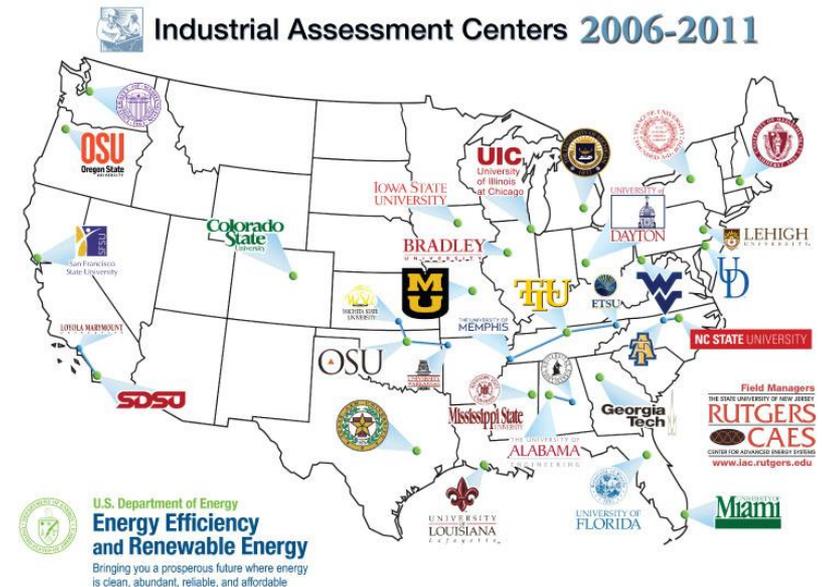
August 8-12

Independent and Team Projects

June 29-August 12

Industrial Assessment Centers (IAC)

- Begun in 1976, the IAC program is a workforce development initiative aimed at creating the next generation of energy engineers
- Teams help identify opportunities and provide recommendations to manufacturers for:
 - energy efficiency improvements
 - waste minimization
 - pollution prevention
 - productivity improvement



National Geothermal Student Competition (NGSC)

- Managed by NREL and funded by DOE
- Eleven teams selected for the 2010-2011 NGSC
- Each team received \$10,000 to conduct their assessment of the Rio Grande Rift.



Rio Grande Rift

2010-2011 Teams	Location
Colorado School of Mines	Golden, CO
Oregon Institute of Technology	Klamath Falls, OR
The Pennsylvania State University	University Park, PA
San Diego State University	San Diego, CA
Stanford University	Palo Alto, CA
Texas A&M University	College Station, TX
University of California, Davis	Davis, CA
University of Idaho	Moscow, ID
University of North Dakota	Grand Forks, ND
The University of Utah	Salt Lake City, UT
Virginia Polytechnic Institute and State University	Blacksburg, VA

Advanced Vehicle Competitions

EcoCAR: The Next Challenge

Challenged students to reengineer a 2009 Saturn Vue over a three-year engineering competition that started in 2008 and ended in 2011.

EcoCAR 2: Plugging in the Future

Challenges 16 universities across North America to reduce the environmental impact of a Chevrolet Malibu without compromising performance, safety and consumer acceptability. **Participants have been announced and series will begin in the fall.**



First place in the 2011 EcoCAR competition was awarded to the engineering team from Virginia Tech, the awards ceremony took place Thursday June 16 at the Library of Congress, Washington D.C.

Hydro Research Fellowship Program

DOE has awarded a 3-year, \$3 million grant to the Hydro Research Foundation for year 2011.

- The Program now funds 23 students at 15 universities.

Benefits

- \$26,000 Living Stipend
- \$2,000 For Discretionary Fund for Professor Supervising Fellow's Work
- Up to \$16,900 allowance for tuition & university-sponsored health insurance
- Attendance at Hydro Fellows Roundtables



American companies are developing innovative ways to generate energy from waves, currents, and tides.

EERE Postdoctoral Fellowships

- Offers recent Ph.D. recipients the opportunity to conduct applied research at universities, national laboratories, and other research facilities
- Focus is on applied technologies not already offered by NSF

SunShot Initiative Fellowships

- Offers fellows key leadership roles in beginning new R&D programs to achieve the goal of **\$1/W installed photovoltaics by 2020**
- Fellowships will begin by mid-November, 2011, and last up to two years
- Initial cohort is targeted to be 3-5 Fellows

"We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard." — President Kennedy, September 12, 1962



Introduction to Hydrogen for Code Officials

The online training course provides an overview of:

- Hydrogen and fuel cell technologies
- How these technologies are used in real-world applications
- The codes and standards required for permitting them

A short quiz is offered at the end of each module.

In addition, the course features a Library section with supplementary information including publications, related links, and a glossary of terms used in the course.

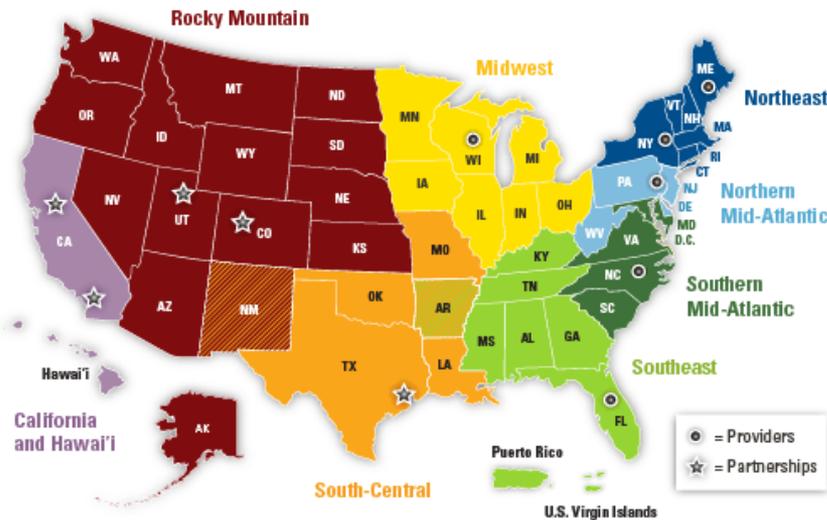
The screenshot shows the 'Introduction to Hydrogen for Code Officials' course page. At the top, there are navigation tabs for 'COURSE MATERIALS', 'LIBRARY', and 'EXIT'. Below these are four sub-sections: 'Hydrogen & Fuel Cell Basics', 'Hydrogen & Fuel Cell Applications', 'Hydrogen Fueling Stations', and 'Fuel Cell Facilities'. The main content area is titled 'Hydrogen Basics' and contains the following text: 'Although we never see it, hydrogen is everywhere in the world around us. It's the simplest element on Earth and the most abundant element in the universe.' Below this, it states: 'A hydrogen atom consists of one proton and one electron. A hydrogen molecule consists of two hydrogen atoms, so hydrogen is often abbreviated as H₂. Hydrogen combines easily with other elements. On Earth, it's rarely found in pure form. Instead, it is found in combinations such as water, methane, and biomass.' To the right of the text is a large blue water droplet icon with 'H₂O' written inside. Below the text are two images: one showing a tractor in a field and another showing a river flowing through a forest. At the bottom of the page, there is a footer with 'Back', 'Slide 1 of 30', and 'Next' buttons.



Solar Instructor Training Network

- Promotes high-quality training in the installation of solar technologies
- Launched in October 2009
- 5-year effort intended to create a geographic blanket of training opportunities in solar installation across the United States

The National Administrator: The Interstate Renewable Energy Council (IREC) since August 25, 2010.



The network has nine providers and partnerships in eight regions of the United States. Providers represent one organization while partnerships represent multiple entities at different locations.

Nine Regional Resource and Training Providers

Kennebec Valley Community College (Solar Heating and Cooling)
Hudson Valley Community College (PV)
The Pennsylvania State College
North Carolina Solar Center at North Carolina State University
Florida Solar Energy Center at University of Central Florida
Midwest Renewable Energy Association
Energy Institute at Houston Community College, Ontility
Salt Lake community College, Solar Energy International, and the Utah Solar Energy Association
California Community Colleges Board of Governors, California Energy Commission, California Centers for Sustainable Energy, Labor Management Cooperation Committee

Questions

- How much more work should be done to identify key needs and gaps?
- To what extent should the Biomass Program explore certain low-cost, high impact options that other DOE programs currently administer?
- What are some of the advantages/disadvantages of choosing one education/workforce development mechanism over another?

Learn more about
EERE Energy Education & Workforce Development
www.eere.energy.gov/education