U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Annual Merit Review and Peer Evaluation Meeting

June 16, 2014

Reuben Sarkar

Deputy Assistant Secretary, Office of Sustainable Transportation

U.S. Department of Energy

EERE Reorganization includes new Office of Transportation

Sustainable TRANSPORTATION - EERE Technology Offices

Hydrogen and Fuel Cells

Vehicles

Bioenergy

- **Efficiency Improvement**
- **Fuel Diversification**
- **Domestic & Renewable Sources**
- **Reduced GHG**

National Energy Goals & Climate Action Plan

Reduce net oil imports by 50% by 2020, compared to 2008

Reduce GHG emissions >80% below 2005 levels by 2050

Meeting Objectives

- **Evaluate DOE-funded projects for their contributions to the Program mission and goals.**
  - *Reviews are based upon a number of factors, such as:*
    - *Technical accomplishments and progress*
    - *Relevance to overall objectives of the Program*
    - *Approach to performing the R&D*
    - *Collaborations with other institutions*
    - *Proposed future research*
- **Communicate the status of the technologies, the latest progress, and future plans**
- **Provide valuable networking opportunity to foster collaboration & continued progress**
- **Demonstrate accountability to Congress and taxpayers**

AMR 2014 – By the Numbers

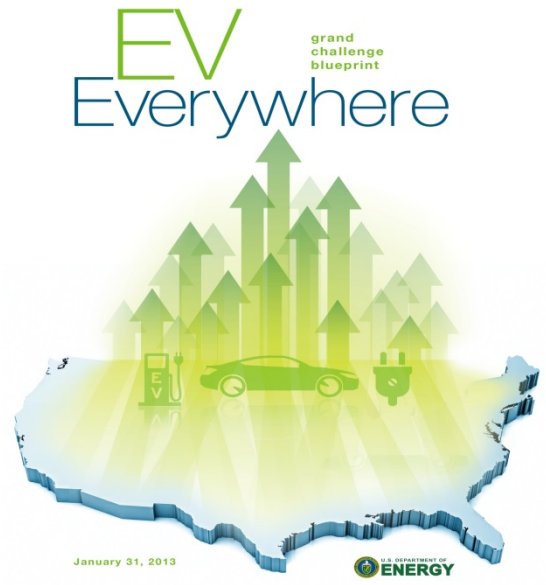
Nearly 1,700 attendees

>350 oral presentations

>150 posters

>500 projects

>370 reviewers



A Clean Energy Grand Challenge

- Enabling plug-in vehicles to be as affordable and convenient for the American family as conventional gasoline-powered vehicles by 2022
- Bring together America's best and brightest scientists, engineers, and businesses to produce EVs at lower cost, with improved vehicle range and increased fast-charging ability

EV Everywhere Goal

Enable the U.S. to be the first in the world to produce plug-in electric vehicles that are as affordable and convenient as today's gasoline-powered vehicles within the next 10 years

For a copy of the Blueprint, visit electricvehicles.energy.gov

President Obama announced EV Everywhere during a visit to Daimler Trucks in North Carolina, March 2012

DOE and Industry- Launched Public-Private Partnership

H_2USA

Mission: To promote the commercial introduction and widespread adoption of FCEVs across America through creation of a public-private partnership to overcome the hurdle of establishing hydrogen infrastructure.

Current partners include (additional in process):

U.S. DEPARTMENT OF ENERGY

Fuel Cell & Hydrogen Energy Association

GlobalAutomakers

GM

DAIMLER

HYDROGENICS
Advanced Hydrogen Solutions

HONDA
The Power of Dreams

EDTA
Electric Drive Transportation Association

NISSAN

HYUNDAI

ITM POWER
Energy Storage | Clean Fuel

Mercedes-Benz

OAK RIDGE National Laboratory

AGA
American Gas Association

California Fuel Cell Partnership
DRIVING FOR THE FUTURE

SCRA

Sandia National Laboratories

PROTON
THE LEADER IN ON SITE GAS GENERATION.

Pacific Northwest National Laboratory

NREL
NATIONAL RENEWABLE ENERGY LABORATORY

AIR LIQUIDE

arc:HYDROGEN

plug power

NUVERA
Making hydrogen make sense.

Massachusetts Hydrogen Coalition

TOYOTA

Argonne NATIONAL LABORATORY

Announcement of New Award Selections

New Selections for Hydrogen Production RD&D

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

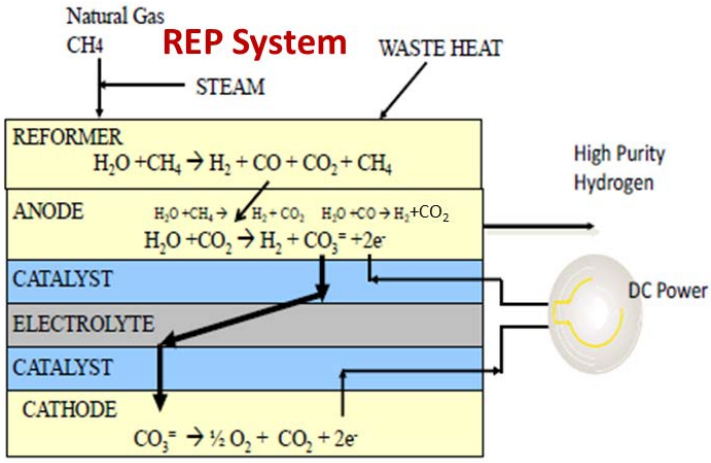
Novel approaches to hybrid reforming, bio-derived liquids and solar water splitting

6 selections, $13.3 M in federal funds

FuelCell Energy Inc.

($900k), Danbury, CT

- Novel reformer-electrolyzer-purifier (REP) system



Pacific Northwest National Laboratory

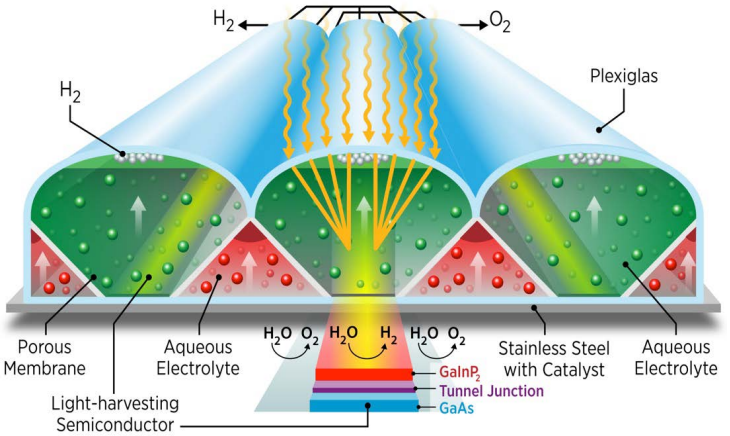
($2.2M), Richland, WA

- Scalable, compact piston-type reactor for H_2 production from bio-derived liquids.

National Renewable Energy Laboratory

($3M), Golden, CO

- High-efficiency tandem absorbers based on novel semiconductor materials
- Economical solar hydrogen production from water.



New Selections for Hydrogen Production RD&D

Novel approaches to hybrid reforming, bio-derived liquids and solar water splitting

6 selections, $13.3 M in federal funds

University of Hawaii ($3M), Honolulu, HI

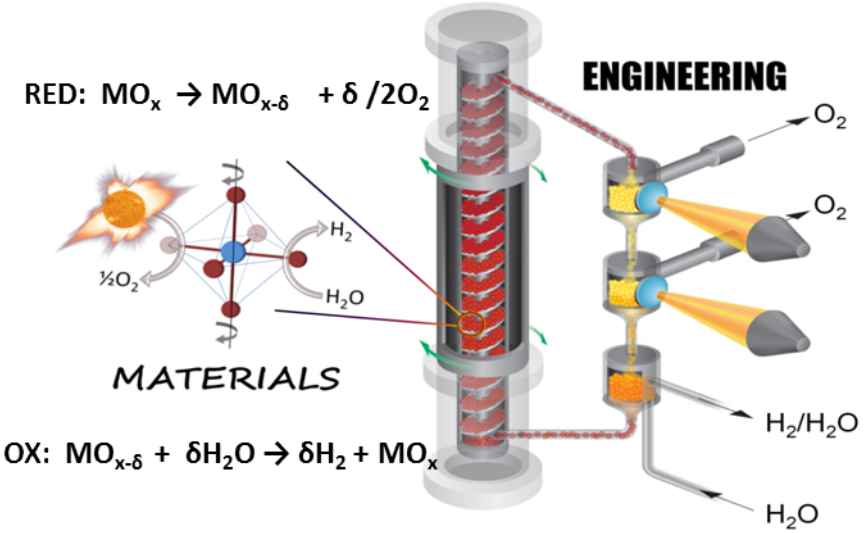
- Photoelectrodes based on novel wide-bandgap thin-films for direct solar water splitting.

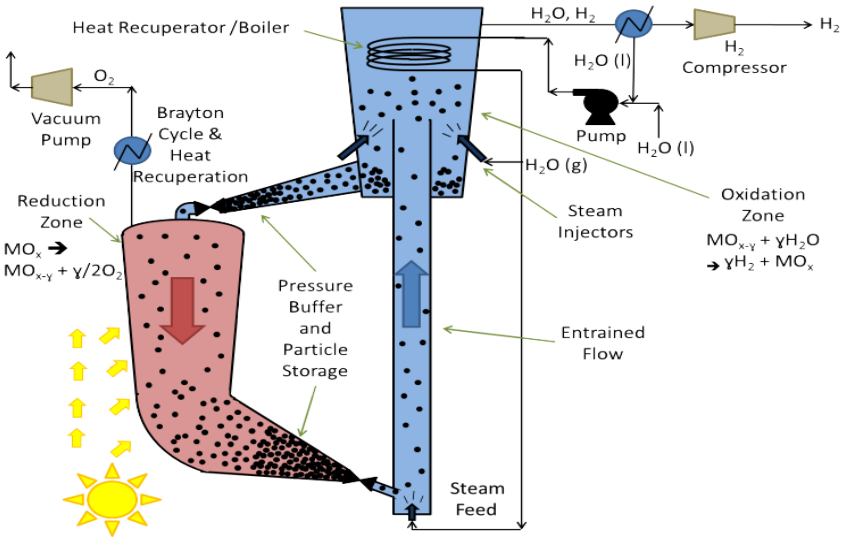
Sandia National Laboratories ($2.2M) Livermore, CA

- Innovative high-efficiency solar thermochemical reactor for H_2 production.

University of Colorado, Boulder ($2M), Boulder, CO

- Novel flowing particle bed solar-thermal reactor to split water with concentrated sunlight.





New Selections for Hydrogen Delivery RD&D

Innovative technologies for forecourt compression, storage and dispensing

4 selections, $7.3 M in federal funds

Southwest Research Institute ($1.8M), San Antonio, TX

- Linear motor reciprocating compressor for forecourt H_2 compression

Oak Ridge National Laboratory ($2.0M), Oak Ridge, TN

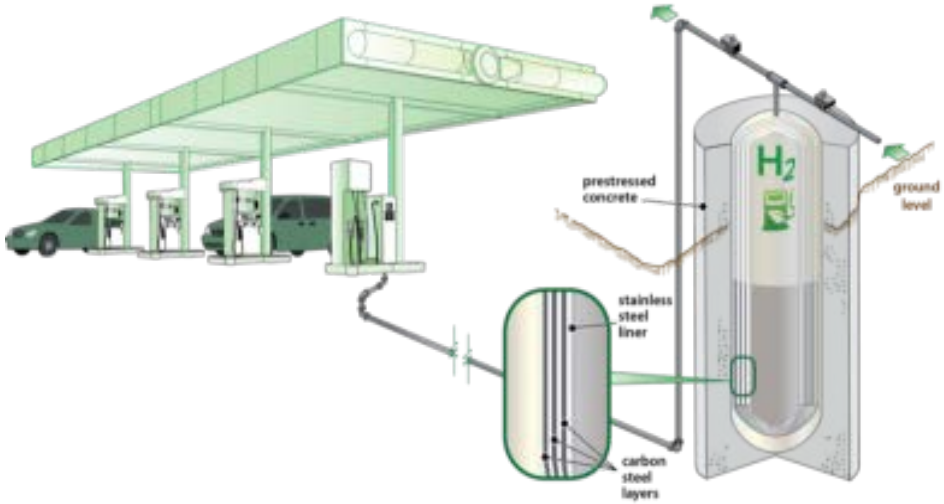
- Low cost steel concrete composite vessel for high pressure forecourt H_2 storage.

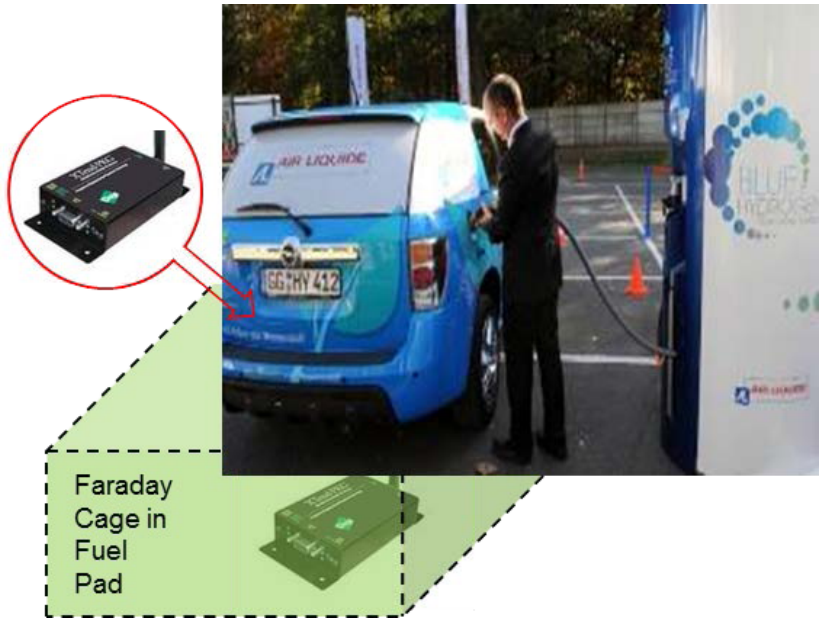
Wiretough Cylinders LLC ($2.0M), of Bristol, VA

- Low cost 875 bar H_2 storage vessel using a steel wire overwrap.

Nuvera Fuel Cells Inc. ($1.5M), Billerica, MA

- Integrated, intelligent 700 bar H_2 dispenser for fuel cell electric vehicle fueling





2014 AMR Plenary Schedule

1:00 **Reuben Sarkar,** *Deputy Assistant Secretary, Sustainable Transportation*
Welcome

1:15 **Alan Taub,** *Professor, Material Science & Engineering Univ. of Michigan*
Keynote Address

1:45 **Sunita Satyapal,** *Director, Fuel Cell Technologies Office*
Overview of DOE Hydrogen and Fuel Cells Program

2:05 **Patrick Davis,** D*irector, DOE Vehicle Technologies Office*
Overview of DOE Vehicle Technologies Office

2:25 **Harriet Kung,** *Director of Basic Energy Sciences, DOE Office of Science*
Overview of DOE Office of Science, Basic Energy Sciences Activities