


Fuel Cell Technologies Program Record		
Record #: 12017	Date: June 2012	
Title: Historical Fuel Cell and Hydrogen Budgets		
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Item

The Department of Energy has spent over \$2 billion (less than 1% of the total DOE budget) during the last 10 years on fuel cell and hydrogen research, development and demonstration. This is approximately 1% of the global investment in the solar, wind, and biomass industries in 2011 alone.

Supporting Information

Program History - From 1990 through 2011, the DOE activities related to hydrogen and fuel cells occurred in several different offices and programs. A summary of the contributing programs is below:

- From 1990 through 2002, the hydrogen and fuel cell programs within the Office of Energy Efficiency and Renewable Energy were two separate programs. The Hydrogen Program was funded from the Energy and Water Appropriations and Fuel Cells from the Interior Appropriations.
- In 2003, the Office of Energy Efficiency and Renewable Energy (EERE) combined the hydrogen and fuel cell programs into one program.
- In 2004, the Hydrogen Fuel Initiative (HFI) began and continued for 5 years, through 2008. The Hydrogen Fuel Initiative combined the DOE efforts of EERE, Fossil Energy (FE), Nuclear Energy (NE), and Basic Energy Sciences (BES), which is within the Office of Science.
- In FY 2009, hydrogen and fuel cell activities continued in the four DOE offices, as coordinated efforts.
- The Solid State Energy Conversion Alliance (SECA), within FE, focused on MW scale solid oxide fuel cell development but was not part of the HFI.

Funding – The charts below summarize the funding for hydrogen and fuel cells since 1990.¹⁻³ For the years 1990 through 1999, EERE funding is shown in Figure 1. Funding for SECA is shown beginning in 2000. The additional funding provided by FE along with NE and BES is shown beginning in 2004.

Overall, the funding for hydrogen and fuel cells from these programs is almost \$2.5 billion from 2002 through 2011. EERE has provided nearly \$1.5 billion (Figure 2) while SECA has provided close to \$510 million during the same time frame (Figure 3). This corresponds to roughly 0.9% of the total DOE budget for the same time period.⁴

As a comparison, in 2011, the global investment in the solar, wind, and biomass industries was more than \$248 billion.⁵ Over 10 years, DOE spent roughly 1% of what was spent in just one year by the solar, wind, and biomass industries. Through DOE-funded efforts, significant

progress has been made, including reducing the cost of fuel cells by more than 80% since 2002, and contributing to more than 310 patents and 33 commercial technologies out in the market.⁶

Figure 1 - DOE Hydrogen & Fuel Cells Budget History^{1,2,3}

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

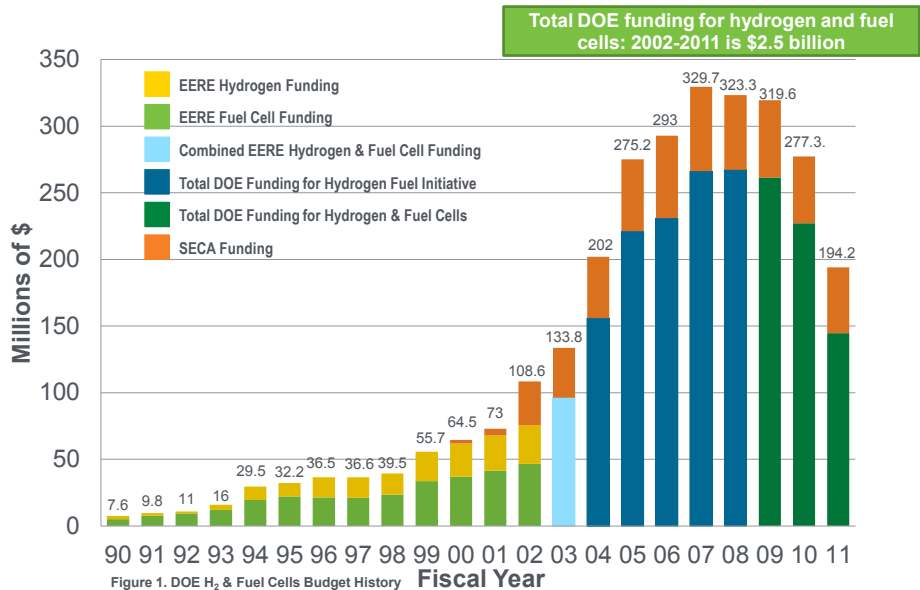


Figure 1. DOE H₂ & Fuel Cells Budget History

Note: Budget numbers for '04-'11 include funding from the EERE Hydrogen & Fuel Cells Program, Fossil Energy, Nuclear Energy, and Office of Science

1 | Fuel Cell Technologies Program Source: US DOE 3/3/2011 eere.energy.gov

Figure 2 - EERE Hydrogen & Fuel Cells Budget History^{1,2}

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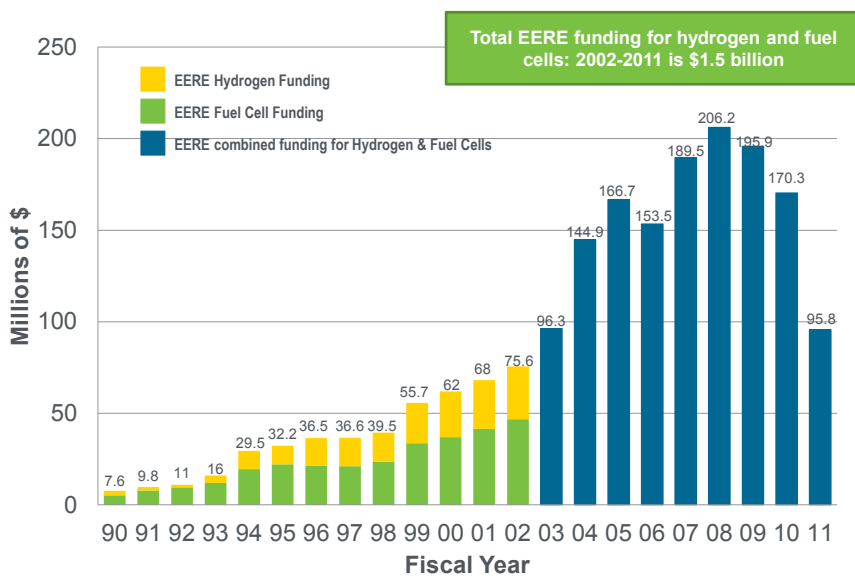


Figure 2. EERE H₂ & Fuel Cells Budget History

2 | Fuel Cell Technologies Program Source: US DOE 3/3/2011

eere.energy.gov

Figure 3 - Fossil Energy Fuel Cell Program: SECA Budget History³

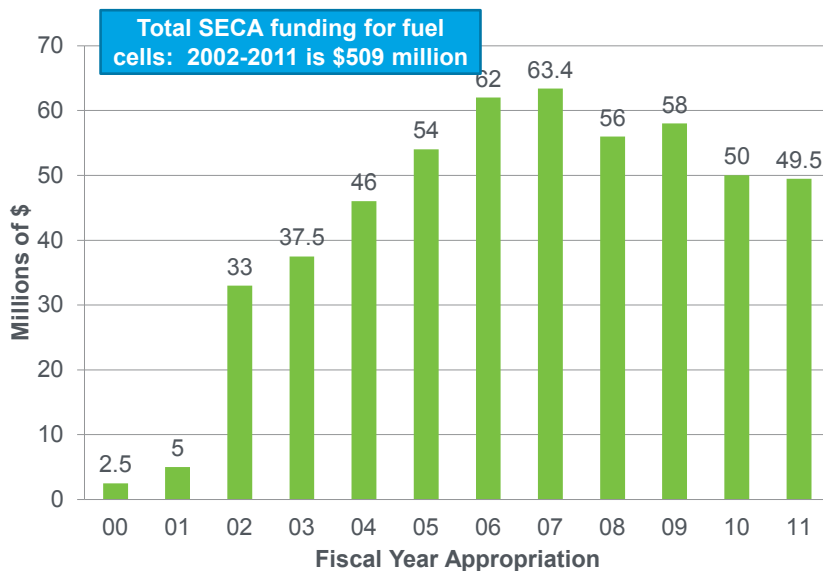


Figure 3. FE Fuel Cell Program: SECA Budget History

References

¹ Dr. JoAnn Milliken, "U.S. Department of Energy Hydrogen Program Annual Merit Review & Peer Evaluation Meeting," Arlington, VA, June 2008,

http://hydrogen.energy.gov/pdfs/review08/0_milliken_h2_program_overview.pdf.

² "Budget" *Hydrogen Program*. U.S. Department of Energy, Web, June 2012,

<http://www.hydrogen.energy.gov/budget.html>.

³ Dr. Shailesh D. Vora, "Overview of DOE SECA Program," National Energy Technology Laboratory, July 2011,

http://www.netl.doe.gov/publications/proceedings/11/seca/pdf/Tue%20AM/Vora.2011_07_26_SECA.pdf.

⁴ DOE Funding History, <http://www.cfo.doe.gov/cf30/DOEFundingHistory.xls>.

⁵ Bloomberg New Energy Finance, *Global Trends in Renewable Energy Investment 2012*, http://fs-uneep-centre.org/sites/default/files/media/globaltrendsreport2012_3.pdf.

⁶ Dr. Sunita Satyapal, "Hydrogen & Fuel Cells Program Overview," Arlington, VA, May 2012,

http://www.hydrogen.energy.gov/pdfs/review12/joint_plenary_satyapal_2012_o.pdf.