



Legislative Update
February 2003

An update service provided by the National Hydrogen Association to its members covering hydrogen legislation.

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DOE FY 2004 Budget Rollout 2

The following are the highlights of the FY 2004 Budget Rollout for DOE pertaining to hydrogen. The budget rollout occurred Monday, February 3. This information is excerpted from the CD-ROM provided to attending stakeholders. It is also available online, and will be updated there. To see the complete budget request or check latest updates, check out DOE's web site at "<http://www.mbe.doe.gov/budget/04budget>".

Keep in mind, this information reflects DOE's FY04 Request to Congress. The NHA will keep members updated on budgets that are appropriated by Congress. At this point, the FY03 DOE budget has yet to be appropriated.

PROGRAM DESCRIPTION

The **Energy Efficiency and Renewable Energy** (EE) program conducts research and development (R&D) and assists with deployment efforts to advance energy efficiency and clean power technologies and practices. EE's **Energy Supply** activities promote the development and use of clean power technologies to meet growing national energy needs, to reduce dependence on foreign energy sources, and to enhance energy security. Also supported is R&D on technologies to improve the reliability and performance of the national electric grid and to make it easier to connect renewable and distributed power sources.

The FY 2004 **Hydrogen Technology** program request increases funding for technology development in support of the Administration's **FreedomFuel** and **FreedomCAR** initiatives. This enhanced program will facilitate an industry decision in 2015 on the feasibility of commercializing hydrogen-powered fuel cell vehicles, and allow rapid market penetration to achieve significant oil displacement and environmental benefits for the year 2020 and beyond. The newly proposed FreedomFuel initiative will help accelerate research and development of hydrogen fuel production, storage, infrastructure, codes, and standards. The Administration is committing over \$1.2 billion towards the FreedomFuel initiative over the next 5 years (FY 2004 through 2008).

EERE's programs are designed to provide the Nation with more energy efficient technologies and greater availability of domestic renewable energy resources. Taken together, these new technologies and energy sources provide the U.S. with unprecedented opportunities to respond to our future energy-related, economic, environmental, and security challenges.

The development of substantially more efficient vehicles, capable of operating on domestically-produced hydrogen, affords the Nation an important opportunity to reduce, and potentially eliminate, its dependence on imported oil. The development of more reliable, high-quality electricity supports our increasingly information-based economy. The development of substantially more efficient buildings and factories, combined with new means of producing electricity on-site, often from locally available renewable resources, will help the Nation address growing electricity infrastructure and reliability problems. The development of locally-available sources of electricity that can provide emergency services even in the event of power or fuel losses can improve our homeland security.

Reducing Dependence on Energy Imports

This budget request implements many of the recommendations of the President's National Energy Policy (NEP) that focus federal investment on future energy solutions.

This budget was formulated using a rigorous performance evaluation process as directed in the President's Management Agenda, to focus research and development resources where they make the most difference. As a result, the FY 2004 request for energy programs maintains high performing energy programs focused on the Nation's energy future. Hydrogen as a source of energy supply holds the promise of an ultra-clean and sustainable energy option for America's future. Another longer-term potential energy solution still at the level of basic scientific pursuit is fusion energy, which if successful, could solve the Nation's reliance on energy imports.

FreedomFuel and FreedomCAR. The Department will begin a major new initiative to accelerate the availability and affordability of hydrogen-powered fuel cells. The new FreedomFuel initiative will focus on research to advance hydrogen production, storage, and infrastructure. It complements the FreedomCAR Partnership announced last year which is aimed at developing viable hydrogen fuel cell vehicle technology as well as supporting a suite of nearer term technologies. FreedomFuel will facilitate a decision by industry to commercialize hydrogen-powered fuel cell vehicles by 2015. The FY 2004 budget proposes \$169

million to continue to implement FreedomCAR to bring a full range of emissions-free, sustainably powered, affordable cars and light trucks closer into being.

The companion initiative, FreedomFuel, focuses on the supply side of hydrogen power -- establishing a delivery infrastructure and resolving storage issues. With the proposed total funding of \$272 million for FreedomFuel and FreedomCAR initiatives in FY 2004, DOE will lead in the design and development of the technologies and infrastructure needed to create a new energy future.

Coal Research. The FY 2004 budget recognizes the abundance of domestic supplies of coal and the enormous contribution coal promises to improve America's energy security. At \$367.5 million, the Department's coal budget focuses resources on advanced research in areas such as carbon sequestration, hydrogen and production, and fuel cell power systems. This President's budget includes \$130 million for a Clean Coal Power Initiative that supports a new round of solicitations in coal-fired power generation. The refocused coal portfolio reflects the PART and R&D Investment Criteria assessments recommending the Department focus more on research and development of new technologies.

Nuclear Energy. Nuclear energy is a critical component of the nation's energy portfolio and will remain a significant part of the American energy future. The total FY 2004 request for the Nuclear Energy program is \$388 million, an increase of \$61 million over the FY 2003 request. To lead the way for new power plants in the United States by the end of the decade, DOE will continue **Nuclear Power 2010** (\$35 million), a cost-shared program with industry to demonstrate key regulatory processes and complete research on advanced reactor technologies. For the longer term, DOE will proceed with **Generation IV** Nuclear Energy Systems (\$9.7 million) to develop advanced energy systems that are more proliferation resistant and have reduced life cycle costs. As part of the Department's FreedomFuel initiative, the new **Nuclear Hydrogen Initiative** (\$4 million) will explore the use of nuclear energy to provide clean and abundant hydrogen. The **Advanced Fuel Cycle Initiative** (\$63 million) will continue development of proliferation-resistant fuel treatment technology to reduce the volume and toxicity of highlevel waste to optimize the first U.S. repository and reduce the need for additional repositories. Finally, this nuclear energy budget request supports revitalization of the Idaho National Engineering and Environmental Laboratory as the command center for nuclear R&D and provides funds for transition of the site's infrastructure and security and safeguards to the nuclear energy program.

DOE EERE FY04 BUDGET REQUEST

		(dollars in thousands)			
	FY 2002	FY 2003	FY 2004		
	Comp.	Amended	Request	Request	Congress
	Approp	Request	Congress		
Energy Efficiency and Renewable Energy					
Hydrogen technology.....	28,892	39,881	87,982	+48,101	+120.6%
Solar energy.....	87,107	79,625	79,693	+68	+0.1%
Zero energy buildings.....	1,367	8,000	4,000	-4,000	-50.0%
Wind energy.....	38,211	44,000	41,600	-2,400	-5.5%
Hydropower.....	4,986	7,489	7,489	—	—
Geothermal technology.....	27,035	26,500	25,500	-1,000	-3.8%
Biomass and biorefinery systems R&D.....	87,683	86,005	69,750	-16,255	-18.9%
Intergovernmental activities.....	5,680	14,807	12,500	-2,307	-15.6%
Electricity reliability.....	76,764	76,506	76,866	+360	+0.5%
Departmental energy management program.....	1,421	3,000	2,300	-700	-23.3%
National climate change technology initiative....	—	—	15,000	+15,000	n/a
Facilities and infrastructure.....	4,870	5,000	4,950	-50	-1.0%
Program direction.....	18,673	16,187	16,577	+390	+2.4%
Total, EERE.....	382,689	407,000	444,207	+37,207	+9.1%
FY 2004 vs. FY 2003					

SIGNIFICANT FUNDING CHANGES – FY 2003 to 2004 Request (\$ in millions)

Hydrogen Research (FY 2003 \$39.9; FY 2004 \$88.0)+\$48.1

Increase supports the new FreedomFuel Initiative as indicated in the following changes: accelerates and expands research on hydrogen production from renewable resources (+\$11.2); expands current storage R&D and initiates advanced storage concepts research (+\$18.7); increases expenditure on hydrogen refueling stations for new fuel cell vehicle/infrastructure validation demonstration (+\$3.2); increases focus on codes and standards and hydrogen safety (+\$11.2); and initiates a national education campaign to communicate the benefits of and barriers to hydrogen technology (+\$3.8).

Funding Summary

FreedomCAR and Vehicle Technologies

	FY 2002 Comparable Appropriation	FY 2003 Amended Request	FY 2004 Request	\$ Change	% Change
Vehicle Systems.....	14,869	14,414	14,514	+100	+0.7%
Innovative Concepts.....	600	1,600	500	-1,100	-68.8%
Hybrid and Electric Propulsion...	47,121	41,973	49,563	+7,590	+18.1%
Advanced Combustion Engine R&D	47,160	40,156	37,085	-3,071	-7.6%
Materials Technology ..	39,158	29,400	39,640	+10,240	+34.8%
Fuels Technology....	24,650	17,999	6,800	-11,199	-62.2%
Technology Introduction	3,450	5,900	5,900	0	0.0%
Energy Efficiency Science Initiative	3,959	0	0	0	0.0%
Transferred to Fossil	-2,000	0	0	0	0.0%
Technical/Program Management Support	2,385	2,121	2,121	0	0.0%
Biennial FreedomCAR Peer Review	0	0	1,500	+1,500	NA
Total, FreedomCAR and Vehicle Technologies	181,352	153,563	157,623	+4,060	+2.6%

Fuel Cell Technology

Transportation Systems	7,466	7,600	7,600	0	0.0%
Distributed Energy Systems	5,500	7,500	7,500	0	0.0%
Stack Component R&D	12,595	14,900	28,000	+13,100	+87.9%
Fuel Processor R&D	20,921	25,300	19,000	-6,300	-24.9%
Technology Validation	0	1,800	15,000	+13,200	+733.3%
Technical/Program Management Support	200	400	400	0	0.0%
Total, Fuel Cell Technology	46,682	57,500	77,500	+20,000	+34.8%

PROGRAM HIGHLIGHTS

The FY 2004 request proposes several program shifts to more efficiently and effectively meet national energy needs. In March of 2002, EE began a complete reorganization of its programmatic and business functions into 11 program offices and a centralized administration office. The FY 2004 request presents a new budget structure that mirrors the new organizational structure. In addition, the budget shifts reflect application of the R&D Investment Criteria and the Program Assessment Rating Tool developed as part of the President's Management Agenda.

The FY 2004 budget request for EE funded activities exceeds the FY 2003 budget request by \$37.2 million (+9.1 percent). The budget request reflects programmatic choices to refocus activities toward longer term, higher risk activities that the private sector is less likely to undertake without federal support.

For instance, the request for the **Hydrogen Technology** program includes a significant funding increase (\$48.0 million) to support the newly proposed **FreedomFuel Initiative**. The additional funding will go towards lowering the cost to produce and deliver hydrogen, developing more compact and lighter weight hydrogen storage, validating hydrogen and fuel cell infrastructure technologies, and developing safety protocols, codes, and standards.

Other hydrogen production highlights:

Nuclear hydrogen initiative request for \$4 million for FY 2004.

The programs within NE fully support **National Energy Policy** recommendations to expand the use of nuclear energy in the United States. Specifically, the new **Nuclear Hydrogen Initiative** will develop advanced technologies that can be used in tandem with next-generation nuclear energy plants to generate economic, commercial quantities of hydrogen to support a sustainable, clean energy future for the United States.

With its new **Nuclear Hydrogen Initiative**, DOE will develop new technologies to generate hydrogen on a commercial scale in an economic and environmentally benign manner. DOE's Offices of Nuclear Energy, Fossil Energy, and Energy Efficiency and Renewable Energy are working in coordination to provide the technological underpinnings of the Administration's **FreedomFuel** initiative. In the case of nuclear energy, DOE will conduct research and development into advanced thermochemical technologies which may, when

used in tandem with next-generation nuclear energy systems, enable the United States to generate hydrogen at a scale and cost that would support a future, hydrogen-based economy. Current fossil-fuel-based methods emit greenhouse gases and are roughly four times more costly than the market will support.

Nuclear Hydrogen Initiative (FY 2003 \$0; FY 2004 \$4.0).....+\$4.0

In FY 2004 as part of the FreedomFuel Initiative, DOE is proposing a new program focused on producing nuclear-based hydrogen in an environmentally friendly and economic manner. The request provides funds to develop a Nuclear Hydrogen Technology Roadmap and initiate work on a facility concept that integrates a nuclear hydrogen production system with an advanced reactor design.

The Fuels program requests \$5 million for hydrogen production from coal, and \$6.5 million is requested for hydrogen production from natural gas.

The mission of the **Fuels** program is to create public benefits by conducting the research necessary to promote the transition to a hydrogen economy. Research will target reducing costs and increasing efficiency of derived hydrogen from coal feedstocks as part of the FreedomFuel Initiative.

Fuels (FY 2003 \$5.0; FY 2004 \$5.0).....\$0

Request transfers existing activities to the Natural Gas program and initiates research on the production of hydrogen from a coal-base.

Natural Gas Technologies (FY 2003 \$22.6; FY 2004 \$26.2)..... +4.0

Exploration and Production (FY 2003 \$15.5; FY 2004 \$14.0)..... -\$1.5

Significant revamping of all programs, offset by the initiation of a new program, Sustainable Supply.

Gas Hydrates (FY 2003 \$4.5; FY 2004 \$3.5) -\$1.0

Request focuses on industry-led field activities to collect samples of naturally occurring hydrate from Alaska permafrost and Gulf of Mexico characterization of Arctic and offshore hydrate resources and reduces safety research, since this is primarily an industry responsibility.

Emerging Processing Technology (FY 2003 \$0; FY 2004 \$6.5) +\$6.5

Request initiates a hydrogen-from-gas program.

EE's Energy Conservation budget request is composed of the following programs. The **FreedomCAR and Vehicle Technologies (FCVT)** program supports the **FreedomCAR** and 21st Century Truck partnerships with industry. The **Hydrogen, Fuel Cells and Infrastructure Technologies (HFCIT)** program supports the **FreedomFuel** and **FreedomCAR** initiatives. The FCVT program funds research on technologies such as advanced lightweight materials, advanced batteries, improved power electronics, hybrid electric systems, and advanced combustion engines to enable light- and heavy-duty highway transportation to become dramatically more efficient. The overall HFCIT program (funded by both Energy Supply and Conservation appropriations) directs research, development, and validation of fuel cell and hydrogen production, delivery, and storage technologies for transportation and stationary applications. Energy Conservation funds support fuel cell power systems RD&D efforts.

The DOE budget rollout document also provides a complete program description (109 pages) of the Hydrogen and Vehicles Technologies, Energy Conservation effort at DOE. It describes the mission, goals, efforts underway at National Labs, and much more.