



## The US Administration's 'Advanced Energy Initiative'

### New programmes and more funding or old programmes and less funding?

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#### Abstract

The Bush administration's announcement of an 'Advanced Energy Initiative' poses challenges for the international climate change agenda as well as the US domestic energy policy agenda. The proposal is politically significant because it has altered the terms of reference in the domestic discourse about US energy and climate policy. However, while it proposes proportionately large increases in the funding levels of some programmes, it also suggests only marginal changes in several current programmes and proposes reductions or even the elimination of others.

#### 1. Introduction

During his annual State of the Union address on 31 January 2006, US President George W. Bush said that "America is addicted to oil, which is often imported from unstable parts of the world" (US White House, 2006a). As a solution to this problem, he announced 'the Advanced Energy Initiative' – a 22% increase in clean-energy research – at the Department of Energy, to push for breakthroughs in two vital areas. "To change how we power our homes and offices", he proposed that "we will invest more in zero-emission coal-fired plants, revolutionary solar and wind technologies, and clean, safe nuclear energy". And he noted that "We must also change how we power our automobiles. We will increase our research in better batteries for hybrid and electric cars and in pollution-free cars that run on hydrogen. We'll also fund additional research in cutting-edge methods of producing ethanol, not just from corn, but from wood chips and stalks, or switch grass. Our goal is to make this new kind of ethanol practical and competitive within six years".

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In a less frequently cited passage, but one with a notable change in the administration's emphasis, the President also observed more expansively: "By applying the talent and technology of America, this country can dramatically improve our environment, move beyond a petroleum-based economy, and make our dependence on Middle Eastern oil a thing of the past."

The speech was not only a symbolically significant event, it is one with real consequences for the politics of US government energy policy-making and climate change policy-making. Its most obvious importance in this respect is that a conservative Republican president and former oil industry executive declared the country to be "addicted" to oil. Beyond the obvious, however, the speech is also important because it reframes energy issues and, by implication, climate issues as well. In particular, policies concerning energy efficiency and alternative energy sources are explicitly defined as national security issues, and specific energy policies (which are also cognate climate change policies) are expressed as preferred solutions to the problem of over dependence on imported oil, especially from the Middle East. The particular stated solution is increased federal government spending on R&D. Energy technology solutions to climate change problems thus become embedded in national security issues.<sup>1</sup> Questions about the framing of issues and the

<sup>1</sup> Further, in the context of the other 'initiative' announced in the speech – the 'American Competitiveness Initiative' – the President called for increased federal government

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associated issues of political psychology are important and will receive more analysis by pundits and others.<sup>2</sup>

*This Policy Brief focuses on issues of political economy – in particular questions about the tangible specifics of the proposal in the context of the US government budget process. The central questions are: What are the proposed funding levels for particular programmes for the fiscal year 2007? How do the administration’s proposed levels compare with previous funding levels that have already been appropriated for fiscal year 2006 and the amounts authorised for fiscal year 2007 in the Energy Policy Act that was passed last year? What are the implications for US energy and climate policy and the future of the international climate change regime?*

In order to answer these questions, Section 2 of the Policy Brief highlights the specific funding proposals in the ‘Advanced Energy Initiative’ as presented in the State of the Union address and in supporting documents released by the White House at that time. In addition, the analysis draws upon: the formal budget proposal documents that were subsequently sent to the Congress; Department of Energy documents made available in conjunction with the public release of the budget; speeches by the President during a trip to muster support for his proposals; and congressional committee materials released as part of the normal budget cycle. Section 3 compares the President’s proposed levels of funding with previously authorised expenditures for FY2007, as contained in the Energy Policy Act that was passed by Congress and signed by the President last year. Those comparisons make it possible to determine the relative levels of the administration’s ‘initiative’ in relation to what he and the Congress agreed they would be in the context of the Energy Policy Act decision-making process. Section 4 focuses on the long-term trends in government outlays for ‘energy conservation’. Section 5 summarises the results of the

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spending for scientific research programmes as well as science education and training programmes, and for making permanent existing corporate tax credits for R&D expenditures.

<sup>2</sup> The domestic political significance attributed to the issues by the White House was underscored by presidential visits and speeches at renewable energy sites – in the private sector and public sector – and a visit to a renewable energy firm by the Secretary of Treasury as well (US, White House, 2006d, 2006e, 2006f). There was an awkward development during the President’s trip to the federal government’s National Renewable Energy Laboratory: it became known that a budget cut in FY2006 had led to a reduction in the work force – a problem that was addressed by an irregular and immediate transfer of \$5 million by the Department of Energy to restore the positions (US, Department of Energy, 2006a).

empirical analysis and discusses their implications for energy and climate policy.

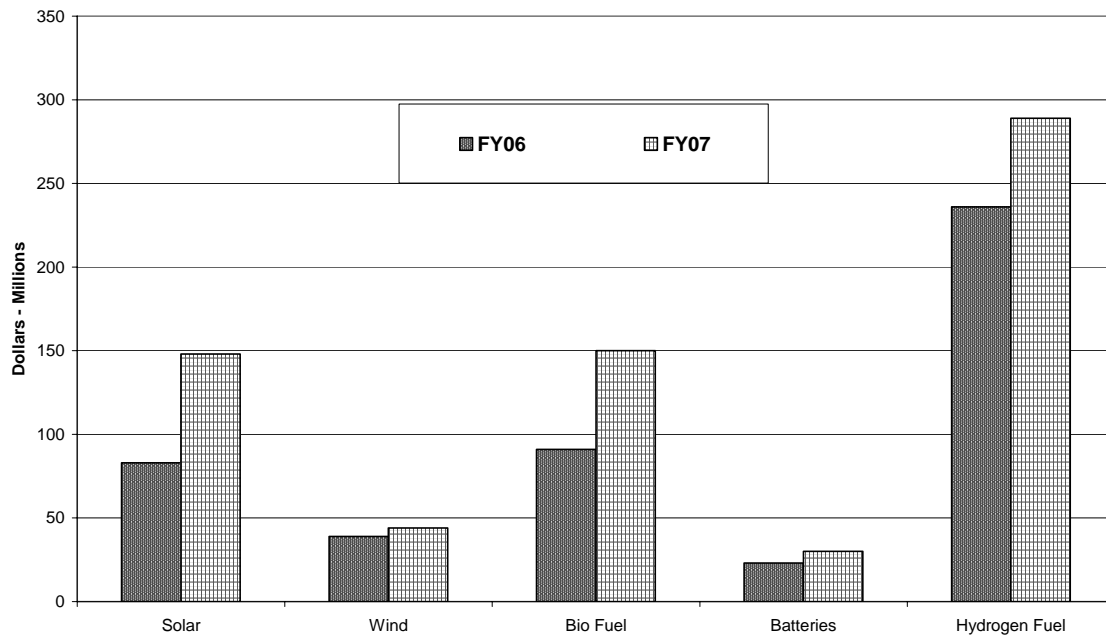
## 2. Elements of the Proposed ‘Advanced Energy Initiative’

It is a challenge to determine the exact programmes that are and are not included in the Advanced Energy Initiative and the precise levels of funding that are being proposed. One reason is that the proposal is contained in several government documents based on different modes of presentation in different contexts at different times by different people. This is partly because a two phase process has been established by a combination of law and precedent, according to which the President includes some highlights of the forthcoming budget proposal in the State of the Union address. There are additional documents and press conferences at that time. Then, the second phase begins a few days later with the formal release of the budget and the official submission of it to the Congress.

The first public announcement of the ‘Advanced Energy Initiative’ was in the President’s State of the Union address on 31 January 2006 (US, White House, 2006a). The list of programmes was not comprehensive, and the only budget number mentioned was a “22% increase” in clean energy research. At the time of the State of the Union address, the White House put out a press release that contained more specifics, but still did not include all of the programmes or all of the figures in the budget proposal (US, White House, 2006b). Nor did it identify the specific expenditures that would constitute the “22% increase”.

The next day, at a press conference of the Secretary of the Energy and the Director of the National Economic Council, yet more numbers were provided, but not in systematic or comprehensive tabular format (US, White House, 2006c). These highlights, however, did reflect the elements of the proposals that the administration wanted to emphasise for political effect. The proposed increases in several programmes are evident in Figure 1 (see p. 3). The administration’s comparisons are expressed in nominal dollar terms, but the proposed amounts are large enough so that they also reflect real increases after an adjustment for an expected inflation rate of approximately two percent. Yet, the highlighted programmes are relatively small, compared with the hundreds of millions of dollars spent each year on nuclear energy programmes (see below) and compared with the proposed overall Department of Energy budget of approximately \$24 billion (which includes nuclear weapons programmes).

Figure 1. Proposed FY2007 outlays versus enacted FY2006 outlays – White House comparisons



Sources: Compiled by the author from White House (US), Office of the Press Secretary, “State of the Union Address”, downloaded from www.whiteHouse.gov on 9 February 2006; White House (US), Office of the Press Secretary, “State of the Union: The Advanced Energy Initiative”, Press Release, 31 January 2006, downloaded from www.whiteHouse.gov on 8 February 2006; White House (US), Office of the Press Secretary, “Press Briefing on the President’s Advanced Energy Initiative”, Secretary of Energy Samuel Bodman and Allan Hubbard, Assistant to the President for Economic Policy and Director, National Economic Council, downloaded from www.whiteHouse.gov on 8 February 2006.

In addition to the programmes included in Figure 1, the administration highlighted ‘clean coal technology’ programmes. However, there was no comparative data involving the amount appropriated for FY2006. In fact, it is problematic to gain a precise fix on the coal programmes because there are several different terms and levels of programme detail used in the budget documents, including ‘coal research’, ‘the ‘President’s coal research initiative’, and the ‘clean coal power initiative’.

A more comprehensive and structured overview of the initiative was presented by the Department of Energy in its supplementary materials (US, Department of Energy, 2006) that were released at the time the administration’s entire budget was formally made public and sent to Congress (US, Office of Management and Budget, 2006). The totals proposed for FY2007 are depicted in Figure 2 (see p. 4), in comparison with the amounts already enacted for FY2006 for the programmes.

*There were already programmes in existence with total expenditures of approximately \$1.8 billion for the current fiscal year, FY2006. The initiative represents an increase of \$381 million in nominal*

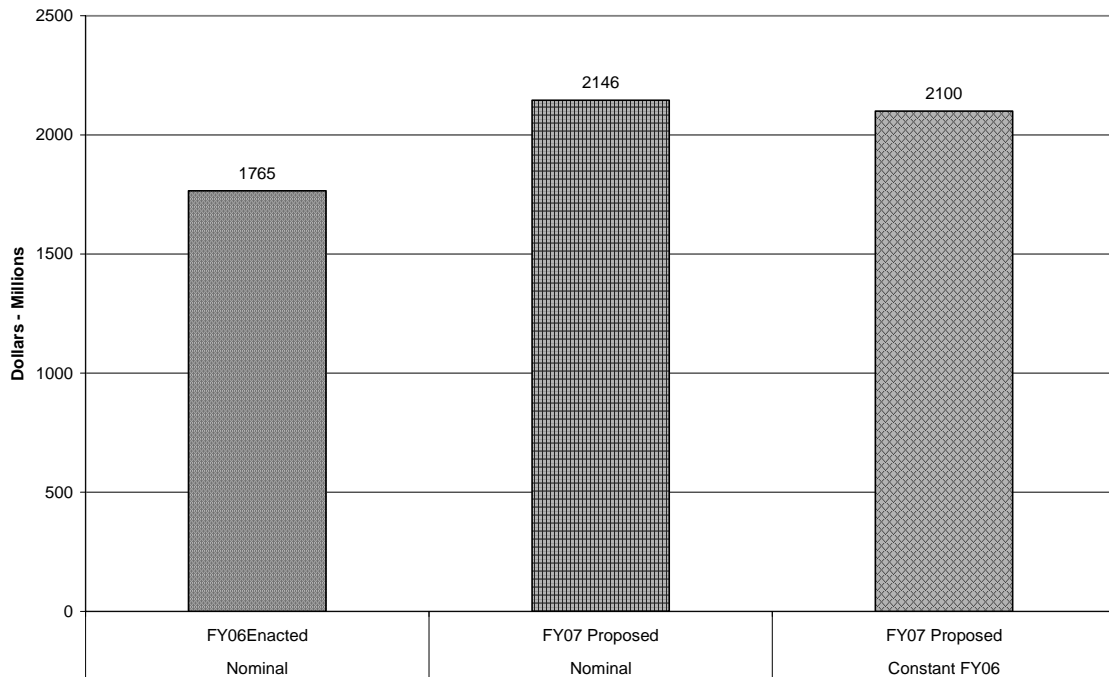
*dollars (21.6 percent) or \$335 million (19.0 percent) in constant dollar terms.<sup>6</sup>*

Figure 3 (see p. 4) displays the distribution among major groupings of programmes according to offices in the Department of Energy. About 43% is for a combination of nuclear and nuclear fusion programmes, and 21% for fossil. *Thus, the Energy Efficiency and Renewable Energy (EERE) share is 36 percent.*

The proposed FY2007 outlays for EERE can be compared in nominal and inflation-adjusted dollars with the amounts already approved for FY2006. *Whereas in nominal terms, the proposal is an increase of \$2 million (0.2 percent), in real, constant dollar terms it is a decrease of \$24 million (2.0 percent).*

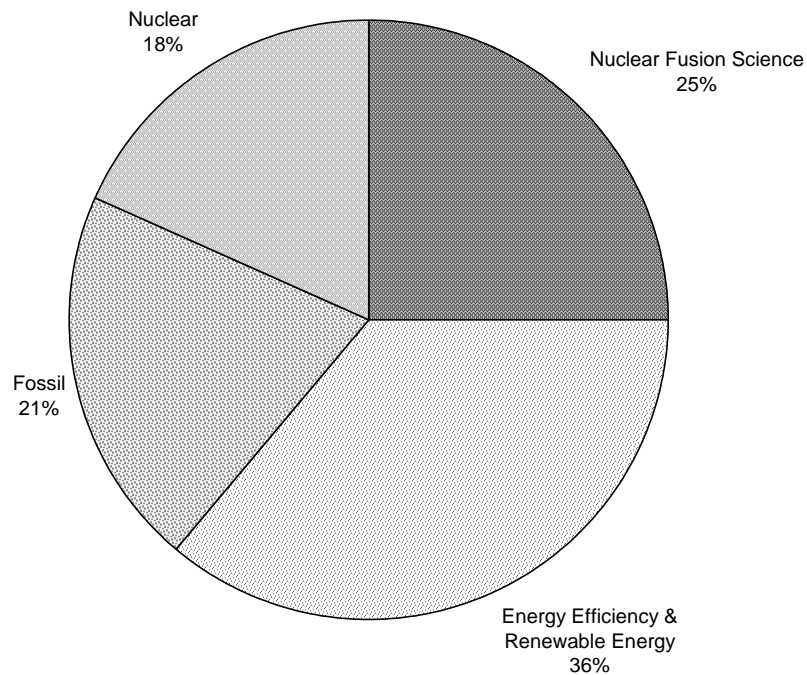
<sup>6</sup> The 21.6 percent increase in nominal terms that is evident here is presumably the basis of the “22% increase” in the President’s speech. However, since the speech included only a suggestive list of programmes in the Advanced Energy Initiative, it is only by further calculations using the data in the Department of Energy materials, plus a simple inference, that one can reasonably assume that this is the basis of the President’s statement in the speech.

Figure 2. Overview of the Advanced Energy Initiative budget: Proposal for FY07 compared with FY2006 enacted



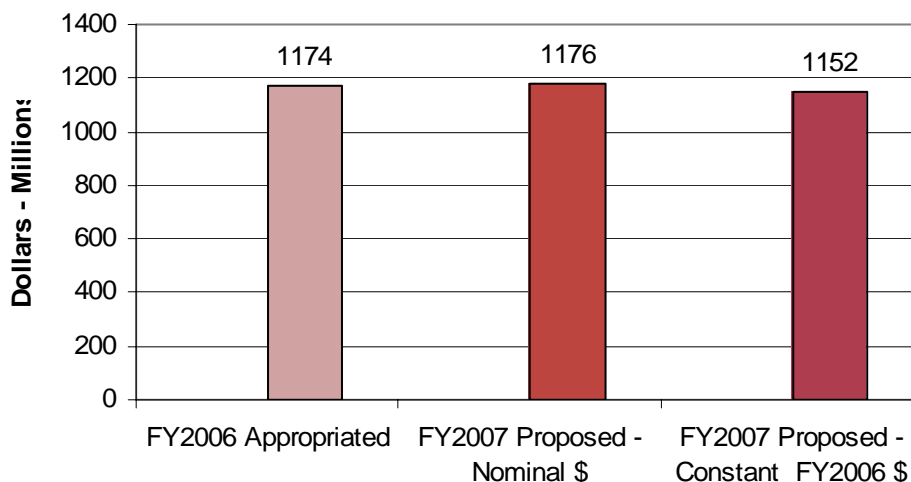
Source: Compiled by the author from data in US Department of Energy, Office of Public Affairs, “Department of Energy Requests \$23.6 Billion for FY 2007”, 6 February 2006; section titled, “Advanced Energy Initiative”, downloaded from [www.doe.gov/print/3150.htm](http://www.doe.gov/print/3150.htm) on 6 February 2006. FY2007 proposed amount in constant FY2006 dollars computed by the author using ‘composite outlay deflator’ data in US, Budget FY2007, Historical Tables, Table 10.1.

Figure 3. Allocation of Advanced Energy Initiative funds in proposal for FY2007



Source: Compiled by the author from data in US Department of Energy (DOE), Office of Public Affairs, “Department of Energy Requests \$23.6 Billion for FY 2007”, 6 February 2006; section titled, “Advanced Energy Initiative”, downloaded from [www.doe.gov/print/3150.htm](http://www.doe.gov/print/3150.htm) on 6 February 2006.

Figure 4. Proposed nominal increase/real reduction in outlays for 'energy efficiency and renewable energy'



Source: Compiled by the author from data in US DOE, Energy Efficiency and Renewable Energy, "Fiscal Year 2007 Budget-in-Brief", table titled "EERE Funding Summary by Program", p. 42. FY2007 proposed amount in constant FY2006 dollars computed by the author using 'composite outlay deflator' data in US, Budget FY2007, Historical Tables, Table 10.1.

### 3. Comparisons with the Authorised Outlays for FY2007 in the Energy Policy Act

The Energy Policy Act of 2005 contains many time-specific and programme-specific authorisations for programmes that are included in the Advanced Energy Initiative.<sup>7</sup> Among the specific authorisations are those for FY2007 in Figure 4. In that figure, it is evident that the President's proposed amounts are substantially less than the authorised amounts. *The President's proposals range from about one quarter (27 percent) to about one half (54 percent) of the authorised amounts.* See Figure 5 (p.6).

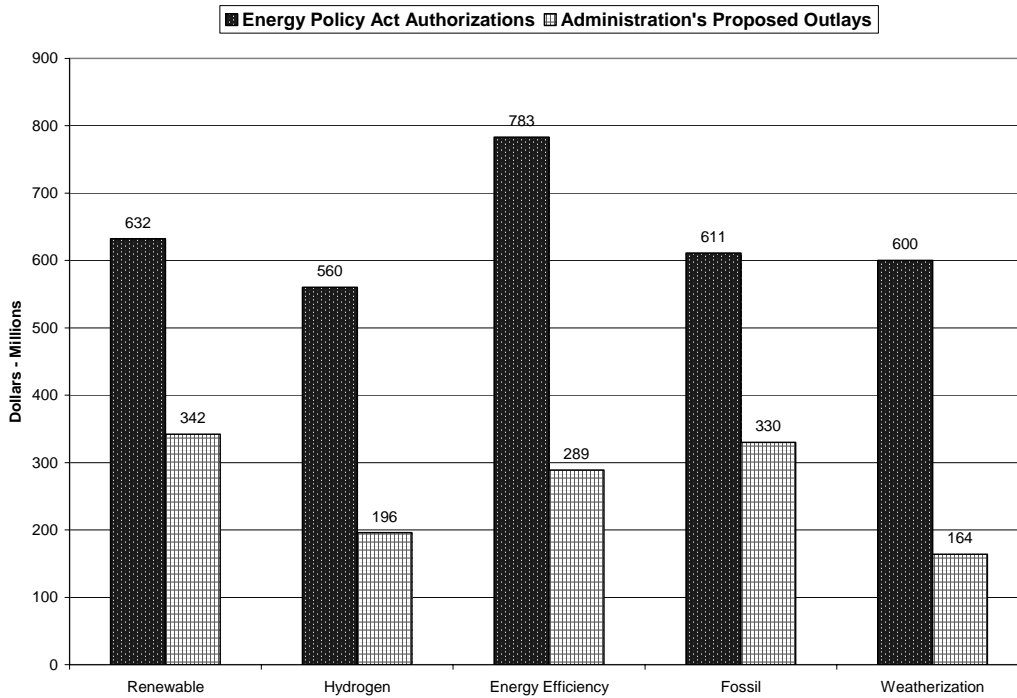
<sup>7</sup> For most government expenditures, outlays are periodically legally authorised by programmatic legislation – sometimes with specific amounts for individual years, sometimes for total amounts extending over many years, and sometimes a combination of the two. In any case, there must also be annual appropriations in the budget process to establish the outlays that can be made for a specific fiscal year. Both the authorised amounts and the appropriated amounts are in bills that have been passed by the Congress and signed by the President. But the appropriations follow the authorisations – sometimes by several years. The appropriated amounts cannot exceed the authorised amounts without further action, and are sometimes significantly less than the authorised amounts. Discrepancies between the authorised outlays and the outlays proposed by the President for appropriations in any given year are sometimes the source of considerable institutional tension between the legislative and executive branches of the government.

### 4. Long-Term Trends in Energy Conservation

Figure 6 (see p. 6) presents the long-term trend in funding for 'energy conservation', which is one of the many 'sub-functions' that are tracked historically in the annual budget documents that the President submits to Congress. Although the programmatic content of such a sub-function changes over time, as technology changes for instance, the sub-function category is nevertheless a useful approximation of changes over the long-term in spending priorities. As Figure 6 indicates, the levels of outlays (in inflation-adjusted constant dollars) have been low in recent years, compared with 25 years ago, and they have been declining during the years of the current administration (as a result of the combination of decisions by the administration and Congress).

In real, constant dollar terms, the proposal for FY2007 is: *12.9% less* than the previous year (FY2006), *26.8% less* than the first budget of the administration (FY2002), *53.0% less* than the peak year for the entire period, which was the last budget of the Carter administration (FY1981), but *69.7% more* than the lowest year for the entire period, which was the last budget of the Ford administration (FY1977).

Figure 5. The Administration's proposed outlays for FY2007 compared with authorized funding levels for FY2007 in the Energy Policy Act



Source: Compiled by the author from data in US Energy Policy Act of 2005 [Public Law 109-58], Titles I, II, III, IV, VIII and IX, downloaded from <http://thomas.loc.gov> on 13 February 2006; and from data in US Senate, Committee on Energy & Natural Resources, "Sen. Bingaman: President's Budget Request for '07 Falls Short Of Many Key R&D Authorizations in Last Year's Energy Bill", 6 February 2006, downloaded from <http://energy.senate.gov> on 6 February 2006. Note that the entry for the 'fossil' category authorisation that appears in the latter source is \$911 million, which is presumably a clerical error since the comparable figure in the Act is \$611 million (the amount that has been used in the chart).

Figure 6. Energy conservation in the US Government budget, FY1977-FY2007 (Outlays for Subfunction 272, 'Energy Conservation')



Source: Data for nominal amounts are reported in *The Budget for Fiscal Year 2007, Historical Tables*, Table 3.2, Outlays by Function and Subfunction, pp. 55-60. The nominal amounts have been adjusted for inflation by the author using the 'composite outlay deflator' reported in *The Budget for Fiscal Year 2007, Historical Tables*, Table 10.1, Gross National Product and Deflators Used in the Historical Tables: 1940-2011, p. 193, which uses FY2000 as the base year. That data series has been converted by the author to FY2006 dollars for this chart in order to facilitate comparison with present-day dollars.

## 5. Summary and Implications

In sum, the budget proposals in the Advanced Energy Initiative include more funds for some programmes and less funds for other programmes. Although it represents a 19 percent real increase in outlays for a collection of programmes, close to half of the outlays are for nuclear and nuclear fusion programmes (with the latter being primarily for basic scientific research with only potential long-term pay-offs for commercialisation). Compared with the FY2006 appropriated amounts for Energy Efficiency and Renewable Energy, the proposal is actually a slight reduction in real, constant dollar terms. Finally, the initiative proposes funding levels that are much less than the amounts authorised for FY2007 in the Energy Policy Act that was passed last year.

In spite of these comparisons with previous congressional and administration funding decisions, the initiative is nevertheless significant in the evolution of US government energy policy and climate change policy. There are proposals for some significant increases in some programmes, solar being the most conspicuous example. More importantly, however, the associated high-profile promotional activities by the President, White House officials, and Cabinet-level officials all signify that the administration perceives that its previous position had become a political liability – not only for the administration itself, but also for the Republican members of Congress who face re-election later this year.

Furthermore, despite the meagre increases in some programmes - and even reductions in others – the rhetoric together with the significant increases in funding levels for selected programmes have substantially and directly changed the domestic dialogue on alternative energy sources – and thus indirectly also changed the dialogue on some aspects of the technological approach to climate change. In short, the Advanced Energy Initiative marks a shift toward a new bi-partisan consensus supporting more aggressive government action on some energy and climate change programmes. Although there is still *not* yet a consensus on either domestic or international programmes for mandatory greenhouse gas emissions targets, there is a widening consensus in support of a range of energy R&D programmes that can contribute to reductions in greenhouse gas emissions.

Though the substantive, tangible programmatic aspects of the initiative may in fact be less than the appearances that it is intended to create, the extensive promotional efforts associated with the announcement of the initiative may have initiated a new era in the domestic politics of US energy and climate change policymaking. The remainder of the

budget process and the congressional election campaigns over the next many months will reveal the extent to which such a shift has occurred.

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## Appendix

### Excerpts from the State of the Union Address and from a Department of Energy Budget Document for FY2007

#### State of the Union Address

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"Keeping America competitive requires affordable energy. And here we have a serious problem. America is addicted to oil, which is often imported from unstable parts of the world. The best way to break this addiction is through technology. Since 2001, we have spent nearly \$10 billion to develop cleaner, cheaper, and more reliable alternative energy sources – and we are on the threshold of incredible advances.

So tonight, I announce the Advanced Energy Initiative – a 22% increase in clean-energy research – at the Department of Energy, to push for breakthroughs in two vital areas. To change how we power our homes and offices, we will invest more in zero-emission coal-fired plants, revolutionary solar and wind technologies, and clean, safe nuclear energy.

We must also change how we power our automobiles. We will increase our research in better batteries for hybrid and electric cars, and in pollution-free cars that run on hydrogen. We'll also fund additional research in cutting-edge methods of producing ethanol, not just from corn, but from wood chips and stalks, or switch grass. Our goal is to make this new kind of ethanol practical and competitive within six years.

Breakthroughs on this and other new technologies will help us reach another great goal: to replace more than 75 percent of our oil imports from the Middle East by 2025. By applying the talent and technology of America, this country can dramatically improve our environment, move beyond a petroleum-based economy, and make our dependence on Middle Eastern oil a thing of the past."

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*Source:* White House (US), "State of the Union Address by the President", released on 31 January 2006, downloaded from [www.whitehouse.gov](http://www.whitehouse.gov) on 3 February 2006.

#### Department of Energy, 'State of the Union: The Advanced Energy Initiative'

##### Changing The Way We Power Our Homes And Businesses

**The Administration Will Work To Diversify Energy Sources For American Homes And Businesses.** Accelerating research in clean coal technologies, clean and safe nuclear energy, and revolutionary solar and wind technologies will reduce overall demand for natural gas and lead to lower energy costs. The President's Advanced Energy Initiative proposes speeding up research in three promising areas:

- **The President's Coal Research Initiative.** Coal provides more than half of the Nation's electricity supply, and America has enough coal to last more than 200 years. As part of the National Energy Policy, the President committed \$2 billion over 10 years to speed up research in the use of clean coal technologies to generate electricity while meeting environmental regulations at low cost. To tap the potential of America's enormous coal reserves, the President's 2007 Budget includes \$281 million for development of clean coal technologies, nearly completing the President's commitment 4 years ahead of schedule.
  - **The President's 2007 Budget Includes \$54 Million For The FutureGen Initiative.** The FutureGen initiative is a partnership between government and the private sector to develop innovative technologies for an emissions-free coal plant that captures the carbon dioxide it produces and stores it in deep geologic formations.
- **The President's Solar America Initiative.** The 2007 Budget will propose a new \$148 million Solar America Initiative – an increase of \$65 million over FY06 – to accelerate the development of semiconductor materials that convert sunlight directly to electricity. These



solar photovoltaic "PV" cells can be used to deliver energy services to rural areas and can be incorporated directly into building materials, so that there can be future 'zero energy' homes that produce more energy than they consume.

- **Expanding Clean Energy from Wind.** The 2007 Budget includes \$44 million for wind energy research – a \$5 million increase over FY06 levels. This will help improve the efficiency and lower the costs of new wind technologies for use in low-speed wind environments. Combined with ongoing efforts to expand access to Federal lands for wind energy development, this new funding will help dramatically increase the use of wind energy in the United States.

#### Changing The Way We Power Our Automobiles

- **We Are On The Verge Of Dramatic Improvements In How We Power Our Automobiles, And The President's Initiative Will Bring Those Improvements To The Forefront.** The United States must move beyond a petroleum-based economy and develop new ways to power automobiles. The President wants to accelerate the development of domestic, renewable alternatives to gasoline and diesel fuels. The Administration will accelerate research in cutting-edge methods of producing 'cellulosic ethanol' with the goal of making the use of such ethanol practical and competitive within 6 years. The Administration will also step up the Nation's research in better batteries for use in hybrid and electric cars and in pollution-free cars that run on hydrogen.
- **The Biorefinery Initiative.** To achieve greater use of 'homegrown' renewable fuels in the United States, advanced technologies need to be perfected to make fuel ethanol from cellulosic (plant fibre) biomass, which is now discarded as waste. The President's 2007 Budget will include \$150 million – a \$59 million increase over FY06 – to help develop bio-based transportation fuels from agricultural waste products, such as wood chips, stalks, or switch grass. Research scientists say that accelerating research into 'cellulosic ethanol' can make it cost-competitive by 2012, offering the potential to displace up to 30% of the Nation's current fuel use.

- **Developing More Efficient Vehicles.** Current hybrids on the road run on a battery developed at the DOE. The President's plan would accelerate research in the next generation of battery technology for hybrid vehicles and 'plug-in hybrids'. Current hybrids can only use the gasoline engine to charge the on-board battery. A 'plug-in' hybrid can run either on electricity or on gasoline and can be plugged into the wall at night to recharge its batteries. These vehicles will enable drivers to meet most of their urban commuting needs with virtually no gasoline use. Advanced battery technologies offer the potential to significantly reduce oil consumption in the near-term. The 2007 Budget includes \$30 million – a \$6.7 million increase over FY06 – to speed up the development of this battery technology and extend the range of these vehicles.

**The Hydrogen Fuel Initiative.** In his 2003 State of the Union address, President Bush announced a \$1.2 billion Hydrogen Fuel Initiative to develop technology for commercially viable hydrogen-powered fuel cells, which would power cars, trucks, homes and businesses with no pollution or greenhouse gases. Through private-sector partnerships, the initiative and related FreedomCAR programs will make it practical and cost-effective for Americans to use clean, hydrogen fuel cell vehicles by 2020. The President's 2007 Budget will provide \$289 million – an increase of \$53 million over FY06 – to accelerate the development of hydrogen fuel cells and affordable hydrogen-powered cars. Through the President's programme, the cost of a hydrogen fuel cell has been cut by more than 50% in just four years.

*Source:* US Department of Energy, Office of Public Affairs, "Department of Energy Requests \$23.6 Billion for FY 2007", 6 February 2006; section titled "Advanced Energy Initiative", downloaded from [www.doe.gov/print/3150.htm](http://www.doe.gov/print/3150.htm) on 6 February 2006.

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- To disseminate our findings and views through a regular flow of publications and public events.

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Justice and Home Affairs  
The Wider Europe  
South-East Europe  
Caucasus & Black Sea  
EU-Russian/Ukraine Relations  
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