A Report of The Heritage Center for Data Analysis

Econometric and Policy Evaluation of the National Energy Policy

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CDA02-01 March 1, 2002

The analysis contained in the Report was completed in August, 2001

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1. Introduction

Not since the oil embargoes of the 1970s has the United States faced such challenges to its energy future. The Department of Energy's Energy Information Administration predicts that over the next 20 years the growth in demand will increasingly outpace U.S. energy production, if production continues to grow at a rate comparable to that of the last decade. Limited access to known resources, regulatory constraints and uncertainty that inhibit investment, as well as a failure to coordinate the nation's energy, environment, and trade policies have contributed to a growing gap between supply and demand. In the long run, this imbalance threatens America's economy, national security, and the standard of living Americans have worked so hard to attain.

The United States is at a crossroads on energy policy. The policymakers in Washington have several options. They can do nothing and hope that the rest of the country does not experience an energy crisis similar to California; they can choose a quick-fix approach and pass short-sighted, politically popular measures that only prolong the country's imbalance between supply and demand; or they can enact a long-term energy plan that solves America's energy needs. President Bush has chosen the latter. The President has proposed a comprehensive and balanced long-term energy plan that corrects the imbalance of supply and demand, ensures that Americans have a reliable and affordable supply of energy for the future, and provides responsible stewardship of the country's natural resources.

Benefits of the Bush Plan. This report is based on an analysis of the President's National Energy Plan (Bush Plan) by the Center for Data Analysis of The Heritage Foundation and DRI/WEFA, Inc., a leading economics and energy consulting group. This analysis found that implementation of the President's comprehensive energy plan would:

- Increase the nation's energy efficiency;
- Reduce demand for energy and decrease reliance on fossil fuels;
- Protect the environment;
- Upgrade the nation's energy infrastructure to facilitate delivery to consumers;
- Lower energy prices for residential, commercial, and industrial consumers;
- Increase supplies through a diversity of fuel sources,
- Increase oil refining capacity, and
- Reduce U.S. dependence on foreign oil.

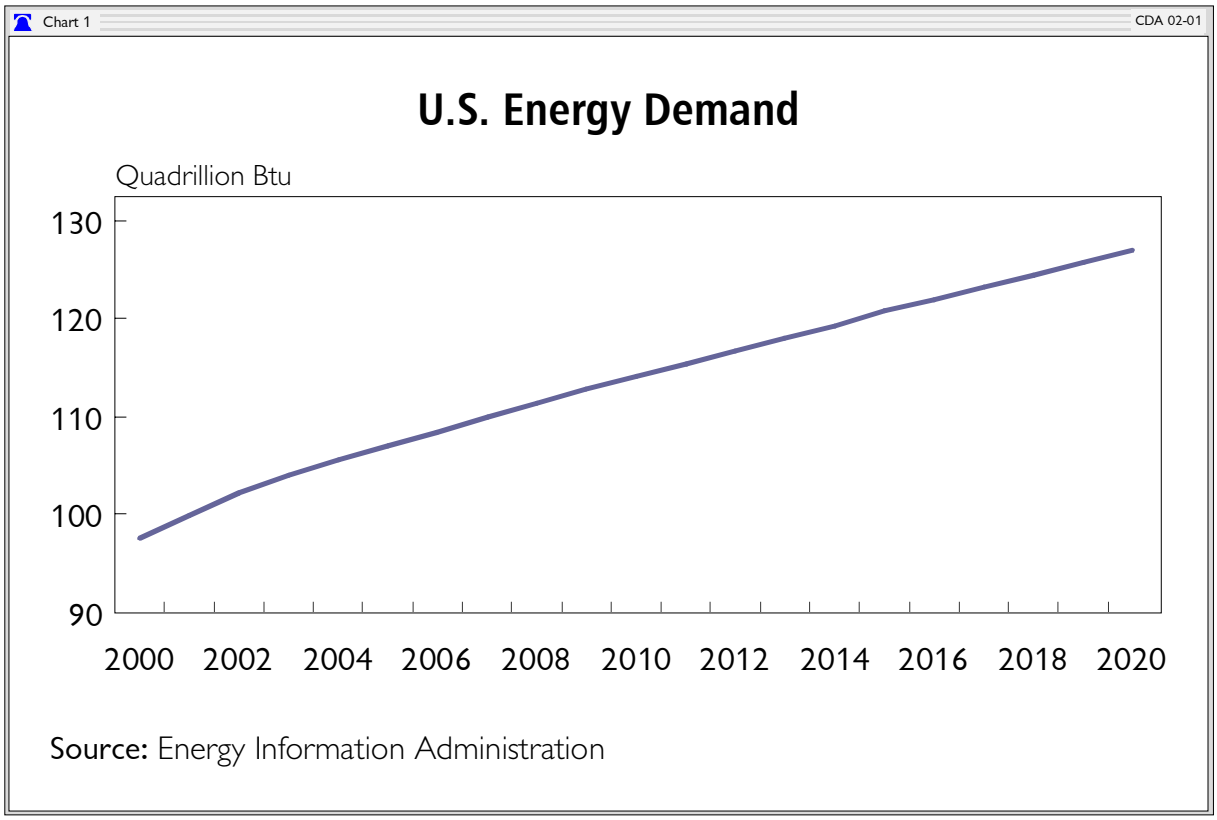
Chart 1
CDA 02-01
U.S. Energy Demand
Quadrillion Btu
130
120
110
100
90
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Source: Energy Information Administration

The cumulative impact of these measures would improve the country's economic performance. Greater energy efficiency, lower energy prices, and increased energy independence would promote economic growth and create over 1.5 million job opportunities. The disposable income (adjusted for inflation) for a family of four would increase by over $1,800 – money that could be used for retirement, education, or other necessities.

Energy Efficiency and Conservation. Energy efficiency and conservation are major components of the Bush Plan. Implementation of the entire plan would improve the nation's energy efficiency by 20 percent in 2020 and reduce the total demand for energy by almost 4.2 quadrillion British thermal units (Qbtu) in 2030 – enough energy to run almost 40 million homes for one year. Energy efficiency would significantly increase from upgrading the nation's energy infrastructure and extending and expanding the Energy Star program and the National Appliance Conservation Act. Improving appliance and transmission efficiencies would reduce average electricity transmission line losses by 50 percent in 2030 and help reduce electricity generation needs by 6.4 percent. Together, these efficiency policies would reduce the number of new power generation units that would have to be built by 364 over the next thirty years.

Consumers would reap the benefits of the Bush Plan's energy efficiency improvements. They would receive the same amount of energy services, such as lighting, heating, and transportation while simultaneously using less energy and reducing their energy bills. In addition, the Bush Plan would provide tax incentives for purchasing new hybrid and fuel cell vehicles.

Environmental Improvements. The Bush Plan would enhance America's environmental achievements, particularly in the long run. Specifically, the President's plan would reduce reliance on fossil fuel energy sources to produce power. Under the Bush Plan, the amount of electricity generated from coal would be reduced by 13 percent in 2030 and natural gas would be reduced by 12 percent during that same period of time. The Bush Plan would also mandate reductions in three pollutants: sulfur dioxide (SO_2), nitrogen oxide (NOx), and mercury from electric power generators. Not only would this provision create certainty within the power industry as to when and at what level pollutants must be controlled, it also should spur investment in new pollution control equipment at these plants as well as improve air quality.

New Source Review (NSR) is a regulatory program under the Clean Air Act Amendments of 1990 that imposes costly pre-construction permitting and pollution control requirements on new sources of pollution. Existing sources may be subject to this program when

they undertake extensive modifications to their facilities. Serious problems have been raised about the extent to which facilities may make modifications to existing plants without triggering NSR. Recent enforcement actions have been taken against facilities for upgrades they made over the years, causing wide-spread uncertainty throughout the industry. These regulatory uncertainties have caused power plants and refineries to delay improvements to their facilities. As a result, older, dirtier, power plants continue to run without upgrades that would reduce their pollution and increase their energy efficiency.

The Bush Plan calls for a review of the NSR program to determine the impact of the program's regulations on energy efficiency, new refinery generation capacity, and environmental protection. The Bush Plan also requires the U.S. Department of Justice to review existing enforcement actions to ensure they are consistent with the statute. A report to the President of these findings is due in mid-August, 2001.

Upgrading the Energy Infrastructure. The Bush Plan recognizes the nation's energy infrastructure is inadequate and unreliable. Current transmission constraints limit the flow of electricity and cause consumers to pay higher prices for power. Moreover, shortfalls in natural gas pipeline capacity combined with right-of-way issues and local permitting delays have constrained the transportation of natural gas and contributed to higher prices. Insufficient domestic pipeline capacity has also caused peak-load problems in moving oil and petroleum products from one region of the country to another resulting in shortages and price spikes in gasoline, heating oil, and liquefied petroleum gas. Upgrading and expanding the nation's infrastructure would reduce disruptions in delivery to consumers, increase capacity, enhance energy efficiency, and lower prices. Of particular significance is the increased energy efficiency that would be gained from upgrading the nation's electricity transmission infrastructure. Average energy line losses could be reduced by about 50 percent from an average line loss of 6 percent to just 3 percent in 2030.

Stable and Reliable Energy Supplies. The Bush Plan would correct the nation's current imbalance between supply and demand. Under the Bush Plan energy supplies increase, but not by as much as they otherwise would have to without the energy efficiency and conservation measures in the plan. Moreover, the Bush Plan would meet consumer demand for energy through diverse fuel sources, including oil, gas, coal, nuclear power, hydropower and non-hydro renewable sources, such as biomass, wind and solar power. No fuel source is favored. Nor does the plan pick winners or losers.

Natural Gas and Oil – Under the Bush Plan, the domestic supply of natural gas would increase by 40 percent from 2000 to 2030. This increase, however, would be 4.5 percentage points less than it otherwise would have to be in 2030 without the energy efficiency programs in the plan that reduce the demand for energy. Moreover, reliance on natural gas for electricity generation would be reduced by 12 percent in 2030.

Likewise, the supply of domestically produced oil increases by almost 27 percent by 2030 and imports of foreign oil would be 16 percent lower by 2030 under the Bush Plan. The U.S. dependence on foreign petroleum would fall nearly 8 percentage points below what it would be if current law continues.

Electricity – Under the Bush Plan, the capacity of electric power plants increases by almost 70 percent from 2000 to 2030, but capacity is 6.2 percent less than it otherwise would have to be in 2030 without the improved appliance and transmission efficiencies in the plan that decrease the demand for electricity by 3.5 percent. This savings translates into enough energy to power 7.2 million homes for one year. It would also result in 364 fewer new power generating units than projected to be built between 2002 and 2030 to meet the nation's growing demand for electricity.

Coal – Under the Bush Plan, reliance on coal to generate electricity would be reduced by 13 percent by 2030. New coal efficiency would improve by 30 percent. The Bush Plan recognizes that technological advancements have led to substantial reductions in the cost of controlling sulfur dioxide and nitrogen oxide emissions while significantly increasing the effectiveness of control systems. Accordingly, the plan funds research of clean coal technology by $2 billion over ten years.

Nuclear Power – Currently, nuclear power accounts for about 20 percent of all U.S. electricity generation. Because of its strong safety record in the United States, its operating performance of about 90 percent and its advantages for air quality, the Bush Plan promotes the expansion of nuclear energy. Streamlining the licensing process, extending the Price-Anderson Act, and providing a permanent repository for nuclear waste would expand electricity generation from nuclear power by more than 270 percent by 2025 compared to current law which would phase-out nuclear power by 2030. An increase in nuclear power would also reduce the need to use fossil fuels to meet the growing demand for electricity in the United States.

Hydropower – Although hydropower accounts only for approximately 7 percent of overall U.S. electricity generation, several Western states as well as Maine and New York depend heavily on this source of energy. The Bush Plan would increase capacity by optimizing efficiency and reliability at existing hydropower facilities while

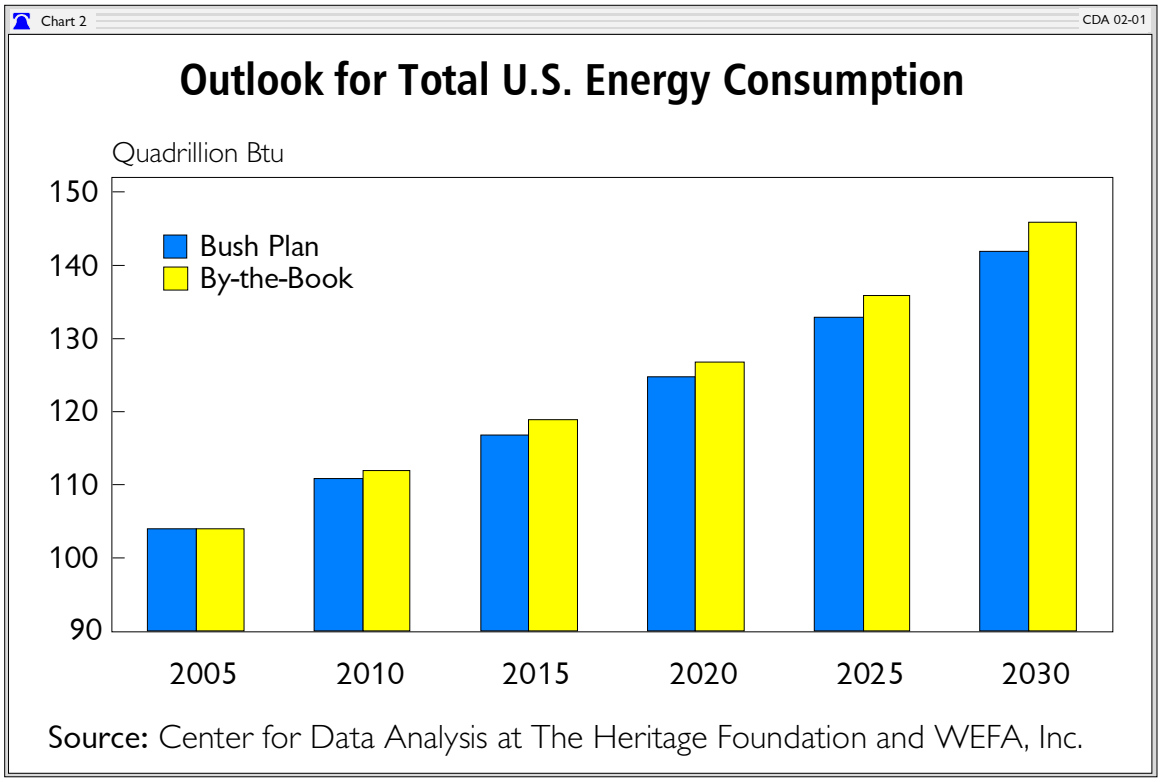
Chart 2
CDA 02-01
Outlook for Total U.S. Energy Consumption
Quadrillion Btu
150
140
130
120
110
100
90
Bush Plan
By-the-Book
2005
2010
2015
2020
2025
2030
Source: Center for Data Analysis at The Heritage Foundation and WEFA, Inc.

supporting reforms of the hydropower licensing process to reduce the time, cost, uncertainty, and interagency conflicts of this procedure. These measures would increase output from hydropower and reduce the need to use fossil fuels to meet the growing demand for electricity.

Renewable and Alternative Energy – Renewable and alternative energy supplies reduce the need to use fossil fuels to produce energy. While renewable and alternative energy resources currently account for only 9 percent of the nation's energy needs, their use is growing as research and technology improve and costs are reduced. The Bush Plan supports sufficient funding for research and development of these resources, promotes use of these resources through various tax incentives, and endorses access to federal lands to increase renewable energy production, such as biomass, wind, geothermal, and solar.

International Trade. The United States energy security depends on sufficient, reliable, and affordable energy supplies. The Bush Plan would enhance energy security and increase energy independence by improving U.S. trade alliances, strengthening America's dialogue with major oil producers, and promoting greater energy production in the Western Hemisphere, Africa, the Caspian, and other regions.

In addition, the Bush Plan would ensure that emergency supply reserve obligations are met while encouraging increased energy efficiency and the use of clean coal technologies. These initiatives would foster a greater diversity of energy production, reduce supply disruptions, and decrease market instability.

Conclusion. The Bush Plan is a comprehensive and balanced long-term approach to correct the imbalance between energy supply and demand that the United States is facing. Implementation of the Bush Plan would reduce the demand for energy; increase energy efficiency; protect the environment; upgrade the nation's aging infrastructure to provide dependable and safe delivery of energy to consumers; increase supplies through a diversity of fuel sources; enhance national security; and ensure Americans affordable, reliable and sufficient supplies of energy into the future. The Bush Plan does all this *and* creates jobs, increases disposable income, spurs investment, and enhances economic growth.

Acknowledgements

The Center divided the analytical work for this report along the following lines:

1. CDA staff took responsibility for managing the timeline and identifying the policies that would be reviewed and analyzed.

2. The staff of WEFA Inc.'s energy group, working under the direction of WEFA's Senior Vice President for Energy Economics, Mary Novak, prepared the thirty-year estimates of change to energy supplies, consumption, and price under three scenarios. The first scenario was designated the "reference case" and represented WEFA's best estimate of what would happen to energy and energy sources without adoption of the NEP. The second scenario was designated "by the book" and contained forecasts of supply, consumption, and price under an unchanged current law. The third scenario was designated "Bush Plan" and represented the country's energy future under full adoption of President Bush's NEP.

3. WEFA's "source" forecasts became the basis for the Center's analysis of how the NEP would likely affect national economic performance. CDA staff, principally Mark Wilson and Bill Beach, worked with WEFA economists to construct a macroeconomic simulation that reflected each of the three source scenarios described above.

4. The Center also took responsibility for the policy evaluation of the NEP. This aspect of the project examined the NEP from the standpoint of regulatory law and economics. Charli Coon took principal responsibility for this analysis.

5. Compilation of the analysis into the present report and construction of the graphics and tables was the responsibility of Rea S. Hederman, Jr., of the CDA.

All aspects of this project—including WEFA's work product conducted under the contract with The Heritage Foundation—remain the property of the Foundation.

The Center gratefully acknowledges the substantial contributions of D. Mark Wilson to this *Report*. This *Report* was completed while Wilson was a Research Fellow with the Thomas A. Roe Institute for Economic Policy Studies at The Heritage Foundation. The Center also gratefully acknowledges the assistance of Timothy Young and John Naugle, CDA Interns for the summer of 2001.

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2. Analysis of the Plan's Recommendations

The Bush Administration's National Energy Plan (NEP) offers a comprehensive program to reestablish energy availability as a national priority. The importance of energy availability as a key component of economic growth and stability has gained increased attention over the last decade as surplus supplies have eroded and the country began to experience intermittent shortages. The NEP proposes a series of initiatives that would encourage domestic supply development.

Balancing these initiatives are programs that improve the country's efficient use of its resources. Through these measures, substantial reductions in energy use per person could be achieved. In tandem, the NEP would engender economic prosperity through improved availability of energy resources at reasonable prices.

In addition, the Administration is committed to meeting or exceeding legislated environmental goals. The NEP provides research and development spending on collaborative government/industry initiatives to develop technology and processes that would enhance energy production while reducing the impact on the environment.

The following section provides a review and static assessment of the components of the Bush Administration's National Energy Plan. It contrasts projections of the impact of the Bush Plan to the by-the-book outlook for energy. WEFA's reference assessment of the energy sector of the economy is also provided. It is similar to the by-the-book case with two key differences: (1) environmental goals are met over a somewhat slightly longer time frame than legislated, and (2) the outlook for nuclear power is more optimistic.

Taking Stock: Energy Challenges Facing the United States

NEP Recommends the President:

1. Issue an Executive Order to direct all federal agencies to include in any regulatory action that could significantly and adversely affect energy supplies, distribution, or use, a detailed statement on: (1) the energy impact of the proposed action; (2) any adverse energy effects that cannot be avoided should the proposal be implemented; and (3) alternatives to the proposed action. Federal agencies would be directed to include this statement in all submissions to the Office of Management and Budget for proposed regulations covered by Executive Order 12866, as well as in all notices of proposed regulations published in the Federal Register.

2. Direct the executive agencies to work closely with Congress to implement the legislative components of a national energy policy.

3. The NEP Development group should continue to work and meet on the implementation of the National Energy Policy and explore other ways to advance dependable, affordable, and environmentally responsible production and distribution of energy.

Analysis

These recommendations are designed to encourage the various branches of government to explicitly recognize the importance of energy to economic performance. The plan requires only a statement that (1) a proposed regulation's impact on energy supplies has been accounted for in all government agencies' analysis and recommendations, and (2) if a proposed regulation would reduce energy supply, alternative strategies have been investigated that would have a lesser impact on energy availability. These recommendations may increase the energy efficiency of future federal regulations but their impact is difficult to quantify.

Striking Home: The Impacts of High Energy Prices on Families, Communities, and Businesses

NEP Recommends the President:

1. Direct the Secretary of Energy to explore potential opportunities to develop educational programs related to energy development and use. This should include possible legislation to create public education awareness programs about energy. Such programs should be long-term in nature, should be funded and managed by the relevant energy industries, and should include information on energy development's compatibility with a clean environment.

2. Take steps to mitigate impacts of high energy costs on low-income consumers. These steps would include

- Strengthening the Low-Income Home Energy Assistance Program (LIHEAP) by making $1.7 billion available annually. This would be an increase of $300 million over the current FY 2001 appropriation.

- Directing the Secretaries of Interior and Health and Human Services to propose legislation to bolster LIHEAP funding by using a portion of oil and gas royalty payments.

- Redirecting oil and gas royalties above a set trigger price to LIHEAP, whenever crude oil and natural gas prices exceed the trigger, as determined by the responsible agencies.

3. Increase funding for the Weatherization Assistance Program by $1.2 billion over ten years. This would roughly double projected spending during that period for weatherization. Consistent with that commitment, the FY 2002 Budget includes a $120 million increase over 2001. The Department of Energy would have the option of using a portion of those funds to test improved implementation approaches for the weatherization program.

4. Support legislation to allow funds dedicated for the Weatherization and State Energy Programs to be transferred to LIHEAP if the Department of Energy deems it appropriate.

5. Recognize unique regional energy concerns and work with the National Governor's Association and regional governor associations to determine how to better serve the needs of diverse areas of the country.

6. Direct Federal Emergency Management Administration (FEMA) to prepare for potential energy emergencies.

- FEMA should work with states' Offices of Emergency Management as they expand existing emergency operations plans to identify potential problems and address the consequences of power shortages. FEMA should use its current Regional Incident Reporting System to identify any situations that might demand immediate attention.

- Using the structure of the already existing Federal Response Plan, FEMA should conduct Regional Interagency Steering Committee (RISC) meetings for states affected by the energy shortfalls. The RISC is a FEMA-led interagency committee comprised of agencies and departments that support the Federal Response Plan. This committee should identify the short-term energy outlook, as well as any expected consequences, in each of the states during the peak summer season at either an upcoming, scheduled RISC meeting or a special-focus RISC meeting.

Analysis

These recommendations focus on the immediate needs of consumers, particularly low-income consumers. They are largely designed to provide financial assistance to these consumers. The LIHEAP recommended is an expansion of the current program that would be partially funded by royalties from oil and gas production. The FEMA program would create a federal energy risk assessment that could provide leadership across federal and state agencies to help consumers during energy crises.

The Weatherization Program is another program designed to provide direct assistance to low-income households and has a small impact on energy consumption. There is an existing DOE program to provide weatherization assistance to low-income households. This has spurred most states to undertake a similar companion program to assist low-income households in winterizing their homes.

The Bush Plan adds $120 million to the budget for weatherization in FY 2002. Under the existing program, individuals with incomes less than 150 percent of the federal poverty level are eligible for up to $2,000 of weatherization assistance. Thus, as many as 60,000 additional homes could be weatherized under the Bush Plan, and with the extension of state efforts, many thousands more could be weatherized.

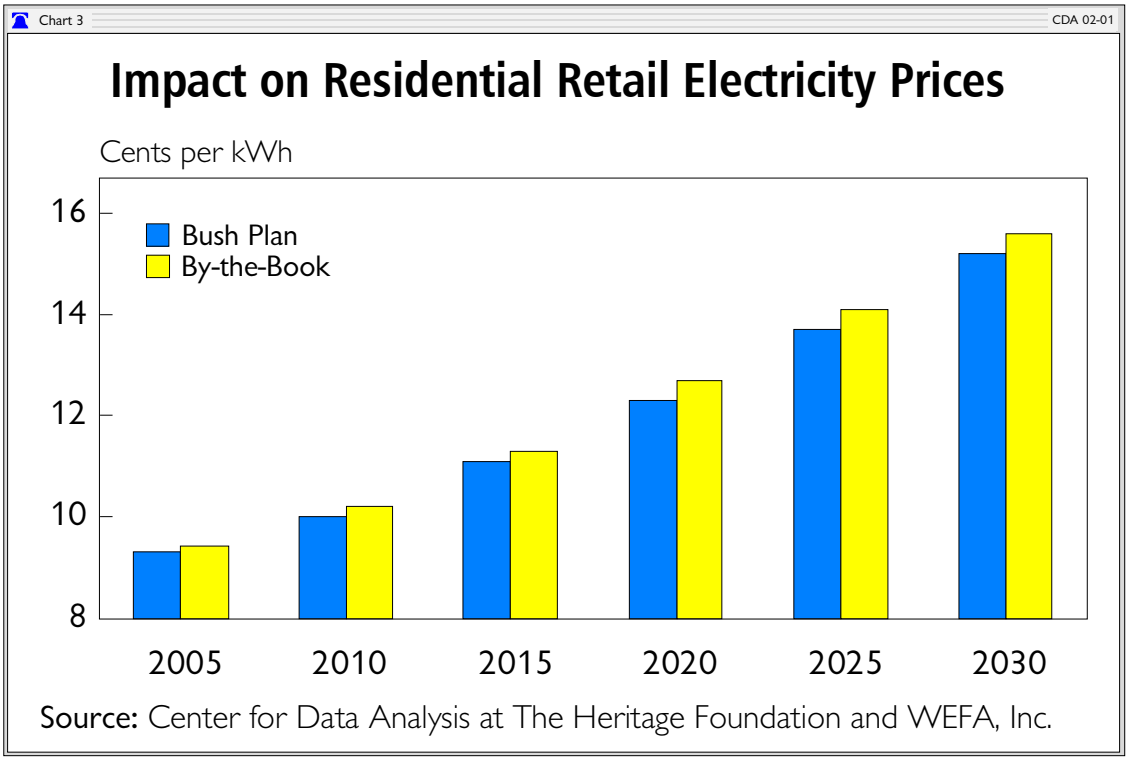


Chart 3
CDA 02-01
Impact on Residential Retail Electricity Prices
Cents per kWh
16
14
12
10
8
Bush Plan
By-the-Book
2005
2010
2015
2020
2025
2030
Source: Center for Data Analysis at The Heritage Foundation and WEFA, Inc.

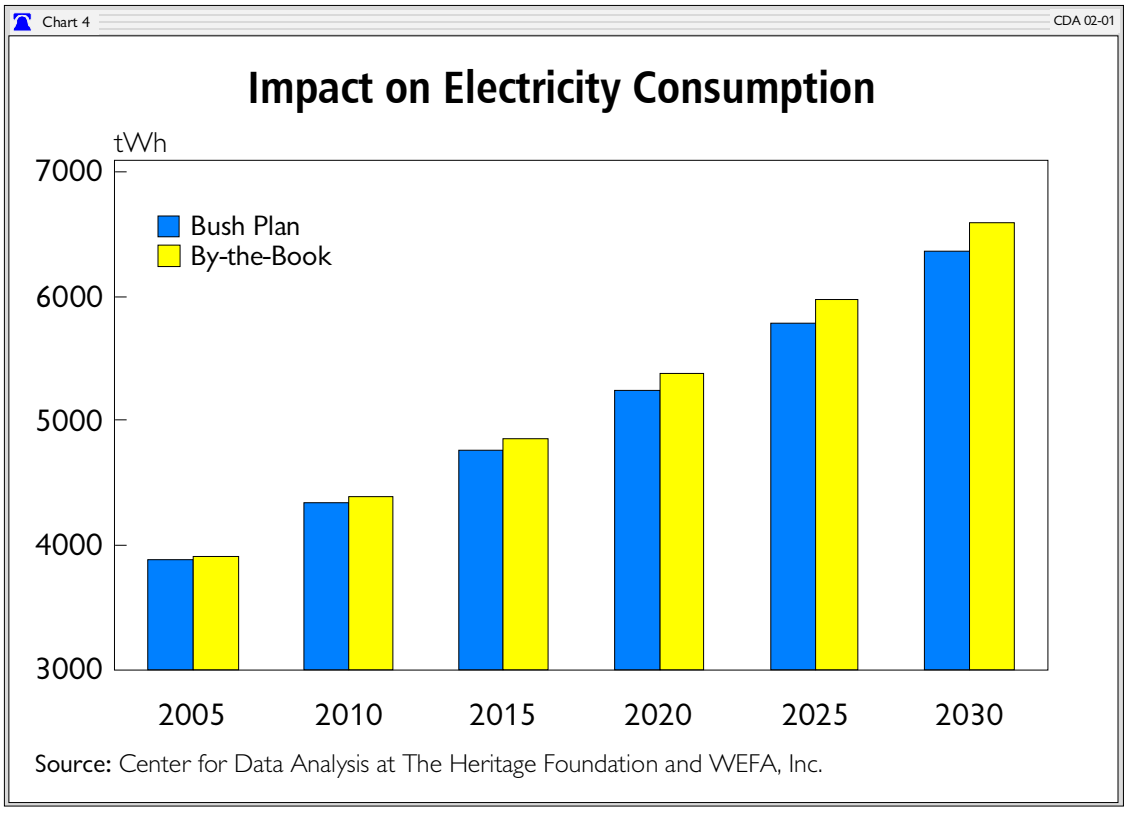


Chart 4
CDA 02-01
Impact on Electricity Consumption
tWh
7000
6000
5000
4000
3000
Bush Plan
By-the-Book
2005
2010
2015
2020
2025
2030
Source: Center for Data Analysis at The Heritage Foundation and WEFA, Inc.

The existing weatherization programs have saved an average of $251 per home in 2000. Weatherization also reduces the overall energy consumption by the equivalent of 15 million barrels of heating oil each year or about 150 gallons of heating oil per weatherized home.

Since heating demand accounts for the majority of residential energy use, weatherization has the potential to significantly reduce total energy demand. If states match the federal weatherization program, each year 120,000 more homes could be weatherized as a result of the Bush Plan — a cumulative 1.2 million homes by 2010, slightly more than 1 percent of total homes. If the improvements were to average 20 percent of household energy demand, a 0.02 percent reduction in total residential energy demand in the United States would result from the weatherization component of the Bush Plan. This is equivalent to enough power to run 29,000 homes in 2010.

Summary

	By-the-Book	Reference	Bush Plan
Protecting Consumers and Businesses			
LIHEAP	Maintain current spending levels.	Maintain current spending levels.	Increase spending by $300mil/ year.
Weatherization	Maintain current spending levels.	Maintain current spending levels.	Increase spending by $120mil/ year. Reduces residential energy use by 0.02% by 2010.
FEMA			Develop risk assessment measure.

Protecting America's Environment: Sustaining the Nation's Health and Environment

NEP Recommends the President:

1. Direct the Environmental Protection Agency (EPA) Administrator to work with Congress to propose multi-pollutant legislation that would establish a flexible, market-based program to significantly reduce and cap emissions of sulfur dioxide, nitrogen oxides, and mercury from electric power generators. Such a program (with appropriate measures to address local concerns) would provide significant public health benefits even as electricity supplies increase.

- Establish mandatory reduction targets for emissions of three main pollutants: sulfur dioxide, nitrogen oxides, and mercury.

- Phase in reductions over a reasonable period of time, similar to the successful acid rain reduction program established by the 1990 amendments to the Clean Air Act.

- Provide regulatory certainty to allow utilities to make modifications to their plants without fear of new litigation.

- Provide market-based incentives, such as emissions trading credits to help achieve the required reductions.

2. Direct the Secretary of the Interior to work with Congress to create a "Royalties Conservation Fund." This fund would

- Earmark potentially billions of dollars in royalties from new oil and gas production in the Arctic National Wildlife Refuge (ANWR) to fund land conservation efforts.

- Provide financing to eliminate the backlog of maintenance and improvement needs on federal lands.

3. Issue an Executive Order to rationalize the permitting of energy production in an environmentally sound manner by directing federal agencies to expedite permits and to take other actions necessary to facilitate approval of energy-related projects. The order would also establish an inter-agency task force chaired by the Council on Environmental Quality to ensure that federal agencies responsible for awarding permits for energy-related facilities are coordinating their efforts. The task force will ensure that federal agencies set

up appropriate mechanisms to coordinate federal, state, tribal, and local permitting activity in particular regions where increased activity is expected.

Analysis

These recommendations contain several measures to improve the environment while maintaining energy availability. One measure is a Royalty Conservation Fund that would provide additional revenue for improvements in federal land management from oil and gas royalties.

Executive Order to Expedite Permitting for Energy Production

A second recommendation is to expedite permitting for energy production. At present, the primary obstacle to higher oil production is not the permitting process, rather it is the political barriers. However, improvements in the process would allow for slightly faster upstream operations and have a small positive impact on overall production. The most oil-prone areas that are off-limits are ANWR and offshore California. (The Rockies and Florida offshore are considered gas-prone.)

As with oil, the permitting process is not a dominant factor that is obstructing the production of natural gas and the construction of natural gas pipelines. For example, the Federal Energy Regulatory Commission (FERC) already has the power of eminent domain for interstate pipelines. However, political opposition by landowners often delays and/or prohibits the construction of pipelines. Similarly, political opposition is the main force restricting access to reserves in the Eastern Gulf area. Thus, while helpful, the proposed changes in the permitting process are likely to have only a minor impact on natural gas production and the cost of natural pipelines.

Multi-Pollutant Legislation

The third recommendation would significantly alter the prospects for electric energy.

This measure proposes the mandatory reduction of three pollutants: SO_2 (sulfur dioxide), NOx (nitrogen oxide), and mercury from electric power generators. The first two pollutants are currently regulated under existing programs, while there is no regulation of mercury from power generators.

One of the major benefits of this proposal is that it creates certainty within the power industry as to when and at what level pollutants must be controlled. This may increase power company

willingness to invest in new pollution control equipment because they will know prior to the investment how much time is available to recoup their capital outlay and they will know that they will not be subject to more stringent regulation during the specified period.

The timing of this proposed regulation is critical to evaluating its impact. While no specifics are offered in the Bush Plan, a hint is provided in the portion of this recommendation which seeks to phase in the reductions "over a reasonable amount of time," equating it to the example set by the 1990 Amendments to the Clean Air Act (CAAA). Under those Amendments, restrictions on SO_2 and NOx were phased in beginning with a waiting period, followed by a period of relatively modest reduction, and culminating 10 to 14 years later with more stringent reduction requirements. If such a model were followed in adopting the recommendations of the Bush Plan, the initial implementation of highly stringent emission regulations would likely be delayed from 2007-2010 to 2012-2015. This would result in somewhat lower electricity production costs from 2004-2012, given that pollution control equipment would be installed in a slower fashion. It must be stressed, however, that the absence of specific information relating to both the timing and stringency of emission controls under the Bush Plan renders this conclusion highly speculative.

Examining the impact of the Bush proposal on a pollutant-by-pollutant basis provides additional insight.

SO_2: Under Title IV of the 1990 CAAA, there was a five-year waiting period (1990-1994) prior to requiring any reductions (beyond those already in place); a five-year period (1995-1999) when relatively modest reductions at the dirtiest plants were mandated; and then the institution of more stringent standards beginning in 2000. These standards are now in place and operating under a system that permits nationwide SO_2 emissions trading, an approach supported in the Bush Plan. Currently, there are no further reductions scheduled under law, although there is a cap on total SO_2 emissions from power plants which remains constant even as electricity generation increases. There are numerous congressional and state-level proposals outside the Bush Plan to further reduce these emissions by an additional 50 to 75 percent, and emissions trading is often proposed to deal with other pollution problems (e.g., regional haze, mercury, PM2.5) for which SO_2 is believed to be a precursor. It is unclear whether the Bush Plan envisions any further tightening of SO_2 standards beyond those already on the books.

NOx: Under Title IV of the 1990 CAAA, modest NOx reductions (from 0.4-0.8# NOx/mmBTU) to deal with acid rain deposition were imposed on power generators in the 1996-2000 time frame. A more stringent set of reductions were instituted under Title I of the 1990 CAAA and are designed to reduce ground-level ozone problems in a 19-state area beginning in 2004. The prevailing standard for that 19-state "SIP Call" region is roughly 0.15# NOx/mmBTU. Questions have been raised as to whether a sufficient number of power plants in the affected area can be outfitted with the necessary pollution control equipment (many will be installing SCRs—selective catalytic reduction units) by 2004 without impairing system reliability. The Bush Plan is silent regarding a delay in this deadline. Such a delay, however, would help ensure the availability of electricity.

Mercury: Power plant mercury emissions are not currently regulated, although steps taken by the Clinton Administration had led to scheduled standards being proposed by 2004. Moreover, EPA decided in December 2000 to require Maximum Achievable Control Technology (MACT) as the appropriate technology approach to control mercury emissions-the most stringent approach. The Bush Plan does not identify either at what level mercury emissions should be regulated or at what point such regulation should begin. The MACT approach, however, would appear to conflict with the Bush Plan's emphasis on emissions trading and other market-based incentives as the most cost-efficient means of reducing pollution.

Relief from New Source Review (NSR)

This recommendation proposes that power companies be provided regulatory certainty by the Administration with regard to the extent to which they may make modifications to their existing plants. The impetus for this recommendation occurred in November 1999 when the EPA issued a series of notices of violation to eight power companies that they had violated NSR standards. Additional orders were subsequently issued to two other power companies and investigations of potential violations were initiated against an unknown number of additional companies.

The essence of the EPA violations was that, over the years, power companies had upgraded selected plants to the point where they had, in effect, become subject to New Source standards. Under these standards, the units would have been required to install the same pollution control equipment as is required of newly constructed plants—usually scrubbers for SO_2 and Selective Catalytic Reduction units for NOx. Most power companies countered that they were simply performing routine maintenance and had not

violated NSR. Of the affected companies, one settled with EPA and two others announced settlements in principle with EPA.

Following a thorough review of the New Source Review program by the Environmental Protection Agency and the Department of Energy, WEFA presumes that the Bush Plan would ensure that the NSR program is implemented in a manner consistent with the Clean Air Act, its related regulations, and congressional intent. This would allow owners of existing power plants to once again engage in routine maintenance, repair and replacement activities, including improvements in plant efficiency that cut fuel consumption and reduce green house gases without triggering NSR. Recent interpretations of NSR regulations discourage innovative improvements that would enhance air quality. Existing power plants that undertake extensive modifications to their facilities, however, would be subject to NSR.

The initial impact of such a policy would be to favor the expansion of existing units over the construction of new units as well as reduce electricity production costs, since expanding an existing unit would not immediately require the costly and or time consuming process of installing pollution control equipment. This would permit more rapid expansion of electric generating capacity, as less time would be needed to simply "add on" to an existing plant than would be needed to secure a permit and construct a new one. Ultimately, if these units were to remain in service over a prolonged period of time, the installation of pollution control equipment (at least scrubbers) would likely be necessary in the 2008-2012 period, since the SO_2 emissions cap would presumably remain in force. As coal-fired electricity generation grew under this proposal, plants would begin to bump up against the emissions cap and the use of scrubbers could no longer be deferred once the currently high bank of emission credits generated from 1995-1999 (Phase I for SO_2 under the 1990 CAAA) was greatly reduced.

Summary

	By-the-Book	Reference	Bush Plan
Protecting the Environment			
Royalties Conservation Fund			
Expedite Permitting for Energy Production – Oil	Current policies.	Current policies.	Minor impact on oil supply.
Expedite Permitting for Energy Production – Natural Gas	Current policies.	Current policies.	Minor impact of gas supply and transportation cost
Expedite Permitting for Energy Production – Coal	Current policies.	Current policies.	Minor impact on coal supply.
Multi-pollutant Legislation	SIP Call effective in 2004; SO_2/PM tighter standards effective in 2008; mercury limits in 2012.	SIP Call effective in 2004; SO_2/PM tighter standards effective in 2008; mercury limits in 2012.	SIP Call effective in 2004; SO_2/PM tighter standards effective in 2008; mercury limits in 2012. WEFA and THF assumption based on SIP Call effective in 2006; SO_2/PM tighter standards effective in 2010; mercury limits in 2014.
New Source Review	NSR more strictly enforced.	NSR remains in effect.	Allows existing facilities to resume routine maintenance activities without triggering NSR resulting in the expansion of current facilities: 10,500 mw over 4 yrs. The impact of these "10,500 mw" of coal capacity would be to reduce natural gas demand by 3-5% or 1 tcf/year.

Summary Explanation

Reference Case:

In this scenerio, WEFA assumes that the NOx will be implemented at the beginning of 2004. WEFA also assumes that the limits on SO_2 will be tightened and the regulation of PM will be tightened around 2008-2010. As a result, all tangential and wall-fired capacity (about 70% of all coal capacity) will have pollution abatement equipment (PABE) added to bring it to compliance over the period 2004-2007

Under these regulations, the remaining 30 percent of capacity (cyclone units or very old, smaller steam units) will be retired, refurbished, or repowered over the period 2004-2013. Under the reference case price assumptions, about 80 percent of capacity will be refurbished and 20 percent will be repowered with a GasCC unit. The refurbished capacity is assumed to also have a nameplate capacity upgrade of 10 percent [that is, the unit is reconfigured to produce 10 percent more power].

In addition, WEFA assumes that 1 percent of tangential and wall-fired capacity is refurbished each year. This results in improved heat rates and increasing the nameplate capacity 10 percent. This adds approximately 210mw each year (1%*70%*300000mw*10%).

Bush Plan:

The Bush Plan is silent regarding a delay in NOx restrictions and the tightening of SO_2/PM standards.

WEFA and The Heritage Foundation (THF), however, assume that Congress will push the NOx restrictions and the tightening of the SO_2/PM standards back two years. The NOx Restrictions would go into effect in 2006 and the SO_2/PM would go into effect in 2010. This would delay the PABE expenditure to the period 2006-2010.

This assumption would also extend the life and use of the cyclone and older, smaller steam coal units. These units would be slowly retired, refurbished, or repowered over the period 2006-2015.

With the uncertainty of the New Source Review removed, a greater percentage of the tangential and wall-fired units would be upgraded, effectively increasing their nameplate capacity. WEFA assumes that 10,500 mw would be possible over a 4-year period.

By-the-Book:

Under the by-the-book assumptions, the NOx restrictions are implemented at the beginning of 2004. WEFA also assumes that the limits on SO_2 will be tightened and the regulation of PM will be tightened around 2008-2010. As a result, all tangential and wall-fired capacity (about 70 percent of all coal capacity) will have pollution abatement equipment added to bring it to compliance over the period 2004-2007.

Under these regulations, the remaining 30 percent of capacity (cyclone units or very old, smaller steam units) are retired, refurbished, or re-powered over the period 2004-2013. Under the Reference Case price assumptions, about 80 percent of capacity is refurbished and 20 percent is re-powered with a gas combined cycle unit. The refurbished capacity is assumed to also have a nameplate capacity upgrade of 10 percent that is, the unit is reconfigured to produce 10 percent more power.

Due to strict enforcement of the New Source Standards, there is no investment in upgrading the tangential and wall-fired units. This assumption reduces the overall efficiency of the coal capacity and nameplate capacity is unchanged.

Using Energy Wisely: Increasing Energy Conservation and Efficiency

NEP Recommends the President:

1. Direct the Office of Science and Technology Policy and the President's Council of Advisors on Science and Technology to review how efficiently the nation's energy resources are being used and make recommendations on increasing that efficiency.

2. Direct the Secretary of Energy to conduct a review of current funding and historic performance of energy efficiency research and development programs in light of the recommendations of the NEP report. Based on this review, the Secretary of Energy would propose appropriate funding of those research and development programs that are performance-based and are modeled as public-private partnerships.

3. Direct the Secretary of Energy to promote greater energy efficiency by

- Expanding the Energy Star program beyond office buildings to include schools, retail buildings, health care facilities, and homes.

- Extending the Energy Star labeling program to additional products, appliances, and services.

- Strengthening Department of Energy public education programs relating to energy efficiency.

4. Direct the Secretary of Energy to improve the energy efficiency of appliances through the following measures.

- Support the appliance standards program for covered products, setting higher standards where technologically feasible and economically justified.

- Expand the scope of the appliance standards program, setting standards for additional appliances where technologically feasible and economically justified.

5. Direct heads of executive departments and agencies to take appropriate actions to conserve energy use at their facilities to the maximum possible consistent with the effective discharge of public

responsibilities. Agencies located in regions where electricity shortages are possible should conserve especially during periods of peak demand. Agencies should report within 30 days to the President, through the Secretary of Energy, on the conservation actions taken.

6. Direct the Secretary of the Treasury to work with Congress to encourage increased energy efficiency through combined heat and power (CHP) projects by shortening the depreciation life for CHP projects or providing investment tax credits.

7. Direct the Administrator of the Environmental Protection Agency (EPA) to work with local and state governments to promote the use of well-designed CHP projects and other clean power generation at brownfield sites, consistent with the interest of local communities. EPA should also work to clarify liability issues that are raised a particular sites.

8. Direct the EPA Administrator to promote CHP projects through flexibility in environmental permitting.

9. Direct the Secretary of Transportation to

- Review and provide recommendations on establishing Corporate Average Fuel Economy (CAFE) standards with due consideration of the National Academy of Sciences study to be released in July 2001. Responsibly crafted CAFE standards should increase efficiency without negatively affecting the U.S. automotive industry. The determination of future fuel economy standards must therefore be addressed analytically and based on sound science.

- Consider passenger safety, economic concerns, and disparate impact on the U.S. versus foreign fleet of automobiles.

- Look at other market-based approaches to increasing the national average fuel economy of new motor vehicles.

10. Direct the Secretary of Transportation to review and promote traffic congestion mitigation technologies and strategies and work with Congress on legislation to implement these strategies.

11. Direct the Secretary of the Treasury to work with Congress on legislation to increase energy efficiency with a tax credit for fuel-efficient vehicles. A temporary, efficiency-based income tax credit should be available for the purchase of new hybrid or fuel cell vehicles between 2002 and 2007.

12. Direct all federal agencies to promote the use of technological advances to better protect our environment.

- The Administration remains committed to investing in Intelligent Transportation Systems (ITS) and encourages the private sector to invest in ITS applications. This Department of Transportation (DOT) program funds the development of improved transportation infrastructure that will reduce congestion, such as traveler information/navigation systems, freeway management, and electronic toll collection. ITS applications also reduce fuel the amount of used for travel.

- The Administration remains committed to the DOT's fuel-cell-powered transit bus program, authored by the Transportation Equity Act for the 21st Century (TEA-21). This program demonstrates the viability of fuel-cell power plants for transit bus applications.

- The Administration remains committed to the Clean Buses program. TEA-21 establishes a new clean fuel formula grant program, which provides an opportunity to accelerate the introduction of advanced bus propulsion technologies into the mainstream of the nation's transit fleet.

13. Direct the EPA and DOT to develop ways to reduce demand for petroleum transportation fuels by working with the trucking industry to establish a program to reduce emissions and fuel consumption from long-haul trucks at truck stops along interstate highways by implementing alternatives to idling, such as electrification and auxiliary power units. EPA and DOT will develop partnership agreements with trucking fleets, truck stops, and manufacturers of idle-reducing technologies (e.g., portable auxiliary packs, and electrification) to install and use low-emission-idling technologies.

14. Direct the Secretary of Energy to establish improving energy efficiency as a national priority with a goal of improving the energy intensity of the U.S. economy (measured by the amount of energy required for each dollar of economic productivity.) This increased efficiency should be pursued through the combined efforts of industry, consumers, and federal, state, and local governments.

15. Direct the EPA Administrator to develop and implement a strategy to increase public awareness of the sizable savings that energy efficiency offers to homeowners across the country. Typical homeowners can save about 30 percent (about $400) a year on their home energy bill by using Energy Star-labeled products.

Analysis

Energy conservation and efficiency are important components of the Bush Plan. Improving the rate of energy efficiency through technological innovation and deployment will stretch domestic supplies farther, reduce dependence on foreign supplies and increase economic performance.

The Bush Plan calls for creative approaches to energy conservation and efficiency, and supports performance-based research and development that is co-funded with industry. In addition, specific programs have been recommended.

Energy Star

The Bush Plan would extend the Energy Star program to additional categories of end users. Energy Star was introduced by the U.S. Environmental Protection Agency in 1992 as a voluntary labeling program designed to identify and promote energy-efficient products, in order to reduce carbon dioxide emissions. EPA partnered with the U.S. Department of Energy (DOE) in 1996 to promote the Energy Star label, with each agency taking responsibility for particular product categories. Energy Star has expanded to cover new homes, most of the building sector, residential heating and cooling equipment, major appliances, office equipment, lighting, consumer electronics, and more product areas. Two such programs are Energy Star Homes, and Energy Star Buildings.

Energy Star Homes: New homes that bear the Energy Star label incorporate features such as improved insulation, tightly sealed construction, sealed ducts, high performance windows, and high efficiency heating and cooling equipment. These homes are generally 30 percent more efficient than standard code homes. This lowers ownership costs because savings from improved energy measures exceed the increase in monthly mortgage costs of buying an Energy Star home. A better quality of life is an added dividend because greater efficiency delivers improved comfort, quieter operation, reduced maintenance, and improved indoor air quality. In 1999, over 8,000 new homes qualified as Energy Star, an increase of more than 50 percent over 1998. The 15,000 Energy Star homes average over 35 percent energy use reductions, saving owners an estimated $5 million annually.

Energy Star Buildings: Many commercial buildings could effectively operate with 30 percent less energy if owners made investments in energy efficient products, technologies and best

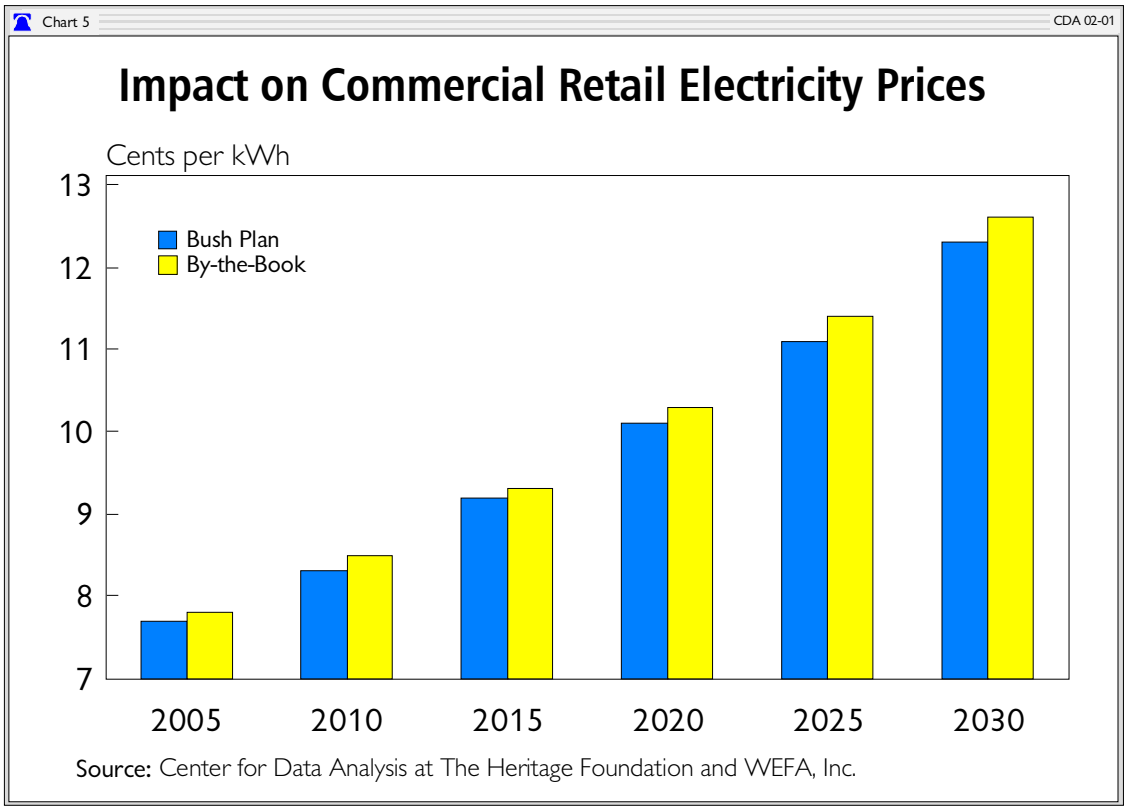


Chart 5
CDA 02-01
Impact on Commercial Retail Electricity Prices
Cents per kWh
13
12
11
10
9
8
7
Bush Plan
By-the-Book
2005
2010
2015
2020
2025
2030
Source: Center for Data Analysis at The Heritage Foundation and WEFA, Inc.

management practices. The Energy Star Buildings program engages a wide variety of building owners and users – retailers, healthcare organizations, real estate investors, state and local governments, schools and universities, and small businesses. Each partner commits to improving the energy performance of its organization and uses the performance metrics and tools provided by Energy Star to achieve significant savings both in dollars and air pollution. By the end of 1999, the Energy Buildings program had the following accomplishments:

- More than 5,000 organizations partnered with EPA to improve their energy performance, committing over 10 billion square feet or 15 percent of the total commercial, public, and industrial building market.
- Partners saved 22 billion kWh of energy, reduced energy bills by $1.6 billion, and prevented emissions of 4.5 million metric tons of carbon equivalent
- Cumulative investments in energy efficient technologies totaled more than $3.6 billion

The Bush Plan would continue these important energy efficiency programs and extend their areas of application.

Appliance Efficiency Standards

The DOE is in the process of approving new standards for refrigerators and air conditioners under the 1987 National Appliance Energy Conservation Act.

The potential to reduce electricity demand in this area is especially high under the Bush Plan. Air conditioners are the principal cause of the summer peak in electricity demand and the need to construct additional generating capacity. The highest potential impact of more efficient air conditioning standards is a saving of up to 24,000 megawatts during the summer peak demand period by 2010.This projection is based upon a 30 percent improvement in energy efficiency for residential air conditioning units and a 20 percent improvement in the efficiency of commercial units.

The WEFA Reference Case assumes that the National Appliance Energy Conservation Act continues to be implemented, albeit at a slower pace. The Bush Plan calls for an extension of this Act over the longer term

Combined Heat and Power

The potential for energy savings with Combined Heat and Power (CHP) generation is estimated at 50 gigawatts under the most favorable circumstances for implementation. Since most CHP installations are under the control of municipal governments which do not pay taxes, the use of tax credits and accelerated depreciation have not been effective in stimulating the adoption of this technology. Moreover, strict environmental regulations regarding permits for new boilers in urban areas has also limited interest in CHP. The Bush Energy Plan would provide tax credits and relaxed environmental restrictions in permitting for CHP to encourage its adoption in other markets. If this program could attract private investment, a substantial amount of the potential for CHP could be realized. Because CHP uses significantly less fuel than traditional power generation, associated emissions of greenhouse gases and air pollutants are lower. In a model that substituted the targeted 50 gigawatts of CHP capacity for conventional capacity, projections show that annual greenhouse emissions would be reduced by 30 MMTCE and annual NO_x emissions by hundreds of thousands of tons.

The development of a large CHP sector would have a major effect on commercial energy markets. First, CHP could provide a significant share of the generation of new energy. Second, the commercial demand for space heating would be met in part by CHP. The heat production of 10 gigawatts of additional CHP would displace about 100 trillion Btus of other heating fuel, assuming a 2000 Btu/kWh heat credit for 5,000 hours of operation during the heating season.

Review Tightening Corporate Average Fuel Economy (CAFE) Standards

Although there has been a lot of political pressure in the past few years to raise the CAFE standards, they have been stymied by consumers' unwillingness to choose efficiency over other attributes. However, recent technological advances are such that engine efficiency should be increasing over the long-term allowing for substantial advances. A recent National Academy of Sciences (NAS) study and review by the DOT may suggest some increase in the standards over the long-term.

More important is the issue of extending the existing CAFE to minivans, SUVs and light-duty trucks. This would have a significant impact on U.S. transportation fuel demand. In fact, it is highly

probable that the existing CAFE standards will be applied to all passenger vehicles. Manufacturers have already begun to make verbal commitments in attempt to forestall the establishment of standards that carry financial penalties for failure to comply. The Bush Energy Plan specifically directs the DOT to look at market-based mechanisms that may be substituted for some of the onerous penalties in place today to produce compliance.

Tax Credit for Fuel-Efficient Vehicles

Given recent concerns about the size of the medium-term budget surplus, any tax credit is likely to be relatively small. Either it must apply to a small portion of the vehicles or each vehicle would get a fairly small credit. If just 10 percent of the cars sold in a given year got a credit equal to 5 percent of their purchase price, this could easily be equal to $1 billion, not an insignificant amount in today's budgetary climate.

If implemented, a tax credit could raise the average efficiency of new automobiles, which would raise the efficiency of the fleet at large. But since the fleet at large expands by about 5 percent per year, raising total fleet efficiency by 0.5 percent per year would mean raising new car efficiency by about 10 percent per year (depending on a variety of other factors, including vehicle retirement, miles traveled, etc.). This is feasible, but difficult if gasoline prices are low and consumers prefer larger, more luxurious vehicles rather than smaller more economical cars such as VW Beetles. Such a program could lower the growth of gasoline demand, which was about 2 percent per year in the 1990s, to 1.5 percent per year, other things being equal. This would ease the strain on the refining sector and reduce margins slightly for gasoline. Since the primary impact on a global level would be slightly less demand for OPEC resources, and the response of these countries would likely be to enact slightly slower capacity expansion, the overall market impact would be very small.

Income Tax Credit for Purchase of New Hybrid or Fuel Cell Vehicles for 2002-2007

Of the alternative fueled vehicles that might be candidates for tax credits, hybrid electric vehicles and fuel cell vehicles are the ones proposed by the NEP. Because latter still faces enormous technical obstacles, any reasonable tax credit is unlikely to have a significant impact on their utilization, particularly within a short time period.

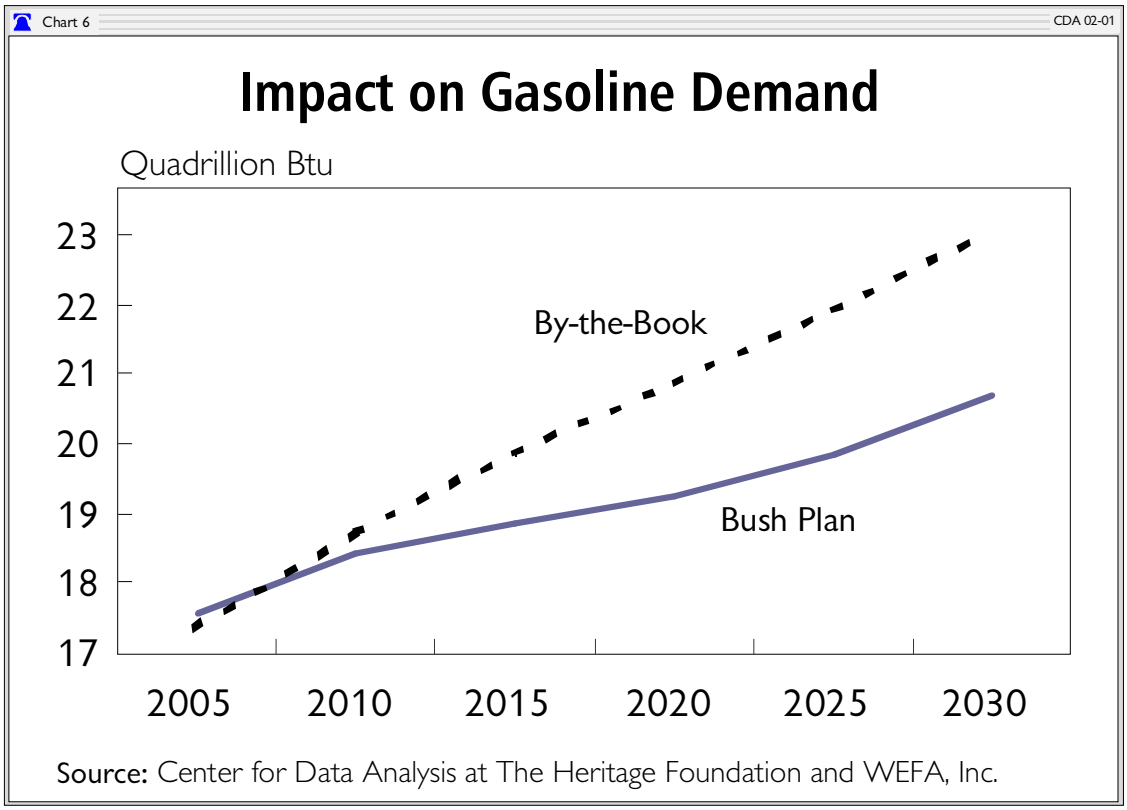


Chart 6
CDA 02-01
Impact on Gasoline Demand
Quadrillion Btu
23
22
21
20
19
18
17
By-the-Book
Bush Plan
2005
2010
2015
2020
2025
2030
Source: Center for Data Analysis at The Heritage Foundation and WEFA, Inc.

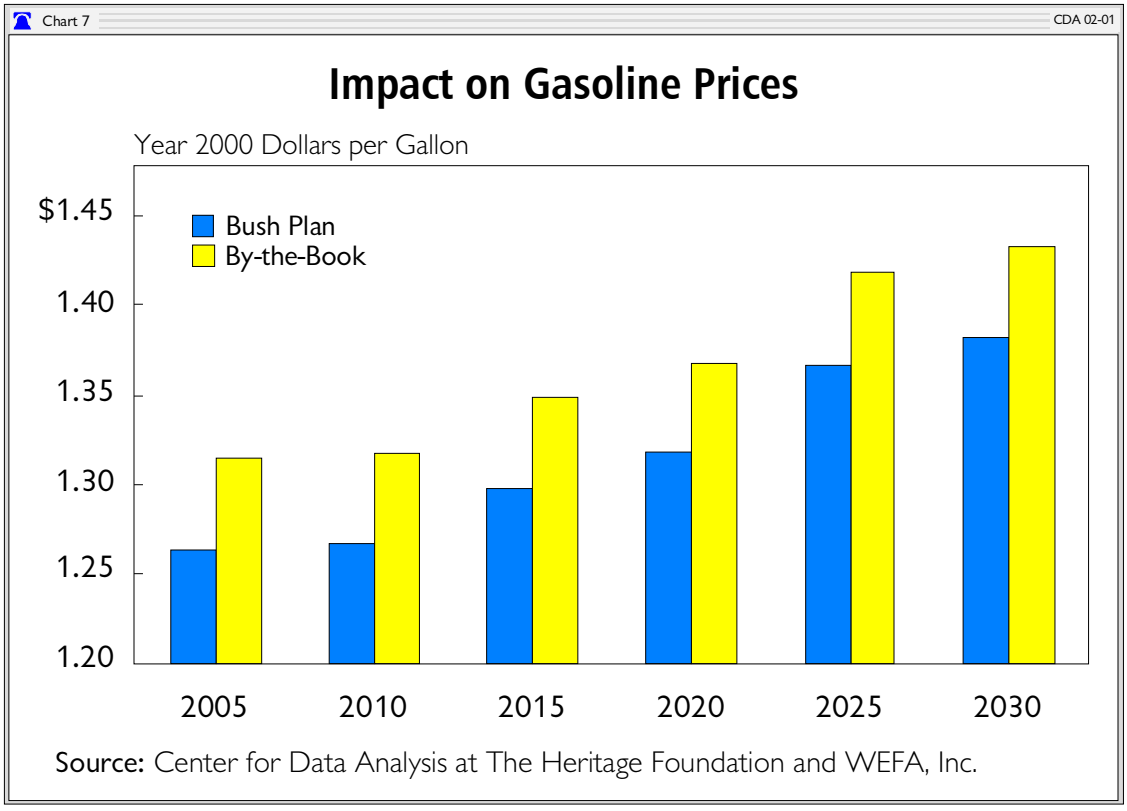


Chart 7
CDA 02-01
Impact on Gasoline Prices
Year 2000 Dollars per Gallon
$1.45
1.40
1.35
1.30
1.25
1.20
Bush Plan
By-the-Book
2005
2010
2015
2020
2025
2030
Source: Center for Data Analysis at The Heritage Foundation and WEFA, Inc.

However, tax credits should improve the market share of hybrid electric vehicles, depending on the size of the credits. At this point, hybrid electric vehicles remain relatively uneconomical but the technology is currently moving into the stage of commercialization. The WEFA base case assumes that this technology will see a growing market share in the long-term future (next three decades), and the tax credit will affect that. However, as the technology improves and the use of hybrids expands, Congress will almost certainly cut back on the use of the tax credit because it will be deemed less necessary and because it will put an increasing burden on the budget.

Summary

	By-the-Book	Reference	Bush Plan
Increasing Energy Conservation and Efficiency			
Energy Star Labeling and Appliance Efficiency Standards	Continuation of current policies.	Continuation of current policies.	Extension of current policies, resulting in a small reduction in energy use.
Combined Heat and Power	Current policy.	Current policy.	Expansion would reduce need for some transmission capability and reduce need for central power capacity.
Review of CAFE Standards	Current policy.	Current policy.	Extension of CAFE to all passenger vehicles by 2010, which reduces US gasoline consumption.
Tax Credit for Fuel Efficient Vehicles	Current policy.	Current policy.	Small tax credit to encourage consumers to purchase more efficient vehicles. Small impact on energy sector.

Energy for a New Century: Increasing Domestic Energy Supplies

NEP Recommends the President:

1. Direct the Secretaries of Energy and the Interior to promote enhanced oil and gas recovery from existing wells through new technology.

2. Direct the Secretary of Energy to improve oil and gas exploration technology through continued partnership with public and private entities.

3. Direct the Secretary of the Interior to examine land status and lease stipulation impediments to federal oil and gas leasing, and review and modify those where opportunities exist (consistent with the law, good environmental practice, and balanced use of other resources).

- Expedite the ongoing study of impediments to federal oil and gas exploration and development, that have resulted from the Energy Policy and Conservation Act.

- Review public lands withdrawals and lease stipulations, with full public consultation, especially with the residents of the affected region, to consider modifications where appropriate.

4. Direct the Secretary of the Interior to consider economic incentives for environmentally sound offshore oil and gas development, where warranted by specific circumstances; explore opportunities for royalty reductions, consistent with ensuring a fair return to the public warranted for enhanced oil and gas recovery; and provide incentives for reducing the risk associated with production in frontier areas or deep gas formations and for development of small fields that would otherwise be uneconomic.

5. Direct the Secretaries of Commerce and Interior to re-examine the current federal legal and policy regime (statutes, regulations, and Executive Orders) to determine if changes are needed regarding proposed energy-related activities and locating of energy facilities in the coastal zone and on the Outer Continental Shelf (OCS).

6. Direct the Secretary of the Interior to continue OCS oil and gas leasing and to facilitate the approval of exploration and development plans on predictable schedules.

7. Direct the Secretary of the Interior to consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve-Alaska. Such consideration should include areas not currently leased within the Northeast corner of the Reserve.

8. Direct the Secretary of the Interior to work with Congress to authorize the exploration and, if resources are discovered, the development of the 1002 Area of ANWR. Congress should require the use of the best available technology and should require that activities will result in no significant adverse impact to the surrounding environment.

9. Direct the Secretary of the Interior to work with Congress and the State of Alaska to put in place the most expeditious process for renewal of the Trans-Alaska Pipeline System rights-of-way to ensure that Alaskan oil continues to flow uninterrupted to the West Coast of the United States.

10. Direct the Secretary of Energy to propose comprehensive electricity legislation that promotes competition, protects consumers, enhances reliability, promotes renewable energy, improves energy efficiency, repeals the Public Utility Holding Company Act, and reforms the Public Utility Regulatory Policies Act.

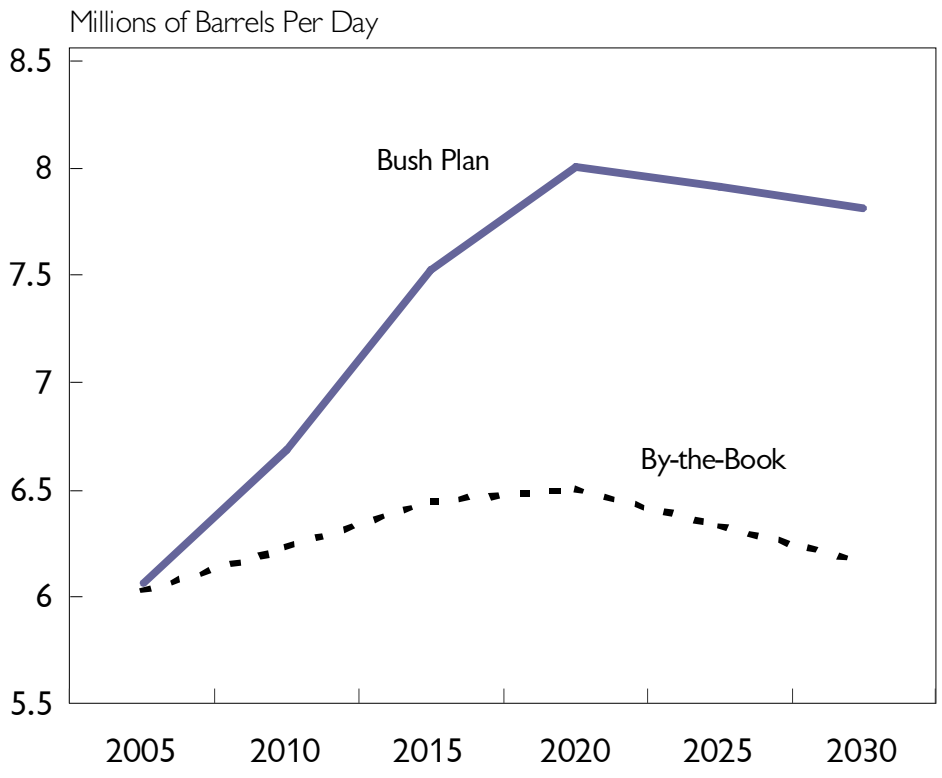
11. Encourage Federal Energy Regulatory Commission to use its existing statutory authority to promote competition and encourage investment in transmission facilities.

12. Direct the Department of Energy to continue to develop advanced clean coal technology by:

- Investing $2 billion over 10 years to fund research in clean coal technologies.
- Supporting a permanent extension of the existing research and development tax credit
- Directing federal agencies to explore regulatory approaches that will encourage advancements in environmental technology.

13. Direct federal agencies to provide greater regulatory certainty relating to coal electricity generation through clear policies whose impact can be readily understood when business decisions are made.

Chart 7 CDA 02-01



Source: Center for Data Analysis at The Heritage Foundation and WEFA, Inc.

14. Support the expansion of nuclear energy in the United States as a major component of our national energy policy. Following are specific components of the recommendation:

- Encourage the Nuclear Regulatory Commission (NRC) to ensure that safety and environmental protection are high priorities as they prepare to evaluate and expedite applications for licensing new advanced-technology nuclear reactors.

- Encourage the NRC to facilitate efforts by utilities to expand nuclear energy generation in the United States by grading existing nuclear plants safely.

- Encourage the NRC to relicense existing nuclear plants that meet or exceed safety standards.

- Direct the Secretary of Energy and the Administrator of the Environmental Protection Agency to assess the potential of nuclear energy to improve air quality.

- Increase funding for nuclear safety enforcement, in light of the anticipated increase in generation.

- Use the best science to provide a deep geologic repository for nuclear waste.

- Support legislation clarifying that qualified funds set aside by plant owners for eventual decommissioning will not be taxed as part of the transaction.

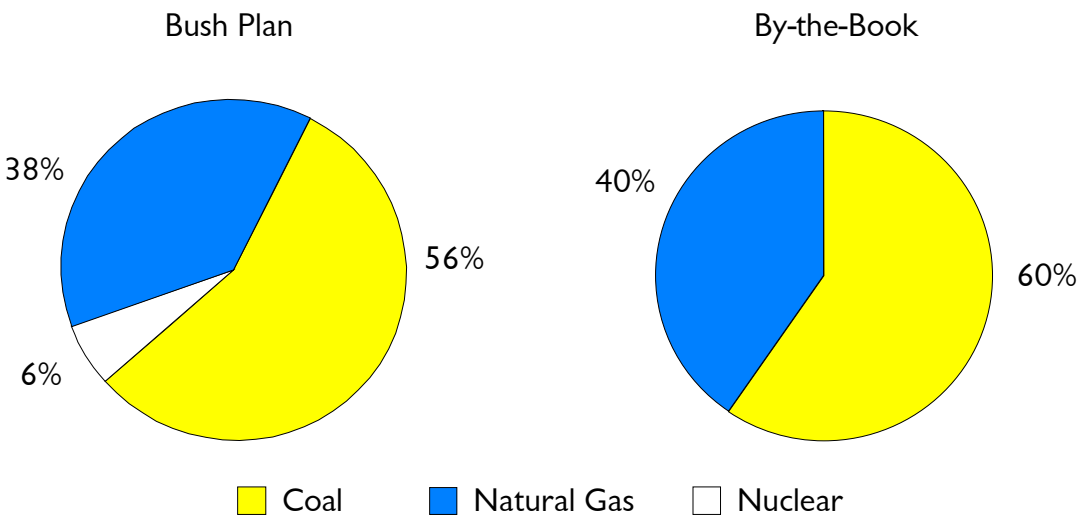
- Support legislation to extend the Price–Anderson Act.

15. In the context of developing advanced nuclear fuel cycles and next generation technologies for nuclear energy, the United States should reexamine its policies to allow for research, development and deployment of fuel conditioning methods (such as pyroprocessing) that reduce waste streams and enhance proliferation resistance. In doing so, the United States will continue to discourage the accumulation of separated plutonium, worldwide.

16. In collaboration with international partners with highly developed fuel cycles and a record of close cooperation, the United States to also consider technologies to develop reprocessing and fuel treatment technologies that are cleaner, more efficient, less waste-intensive, and more proliferation-resistant.

Chart 9 CDA 02-01

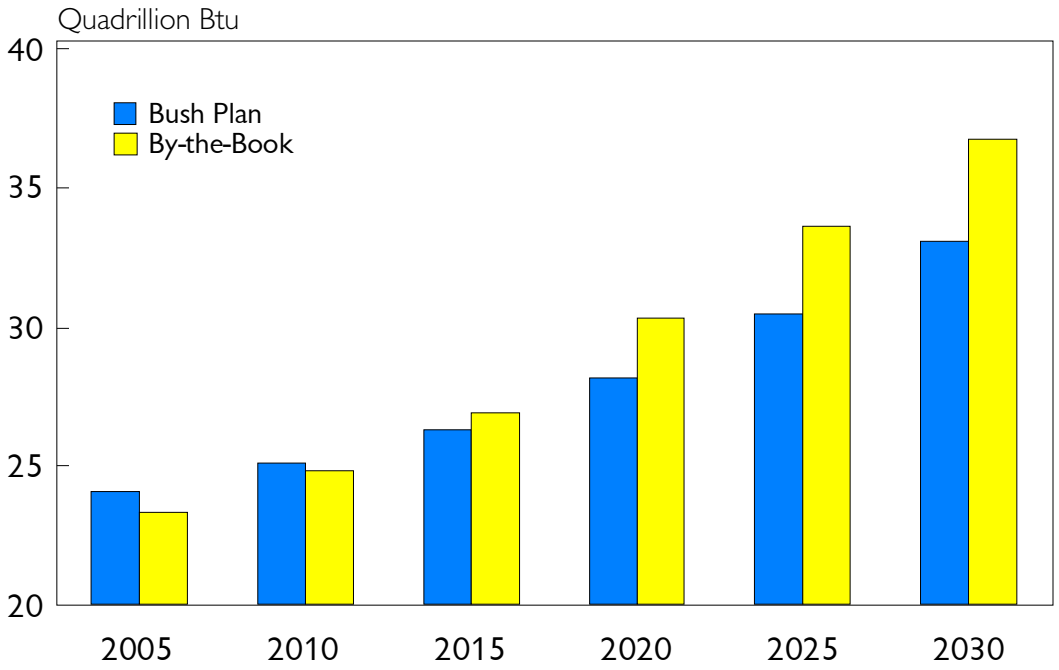
Comparison of Electricity Generation Breakdown, 2030



Source: Center for Data Analysis at The Heritage Foundation and WEFA, Inc.

Chart 10 CDA 02-01

Coal Demand



Source: Center for Data Analysis at The Heritage Foundation and WEFA, Inc.

17. Encourage the Federal Energy Regulatory Commission and direct federal resource agencies to make the licensing process for hydropower more clear and efficient, while preserving environmental goals. This includes:

- Supporting administrative and legislative reform of the hydropower licensing process.
- Directing federal resource agencies to reach interagency agreement on conflicting mandatory conditions for licensing before they submit their conditions to FERC for inclusion in licensing requirements.
- Encourage FERC to adopt appropriate deadlines for its own actions during the licensing process.

Analysis

Clean Coal Technology Program Extension and Enhancement

The Clean Coal Technology Program is on the verge of bringing to market exciting new capacity with the potential for significant increases in fuel efficiency. The reference case includes a very aggressive outlook for New Coal efficiency – projecting an improvement of approximately 30 percent from current capacity. (The current average heat rate of 10,500, while new coal has an assumed heat rate of 8,500.) The Bush Energy Plan's support of Clean Coal Technology is critical for meeting the country's efficiency and emission goals.

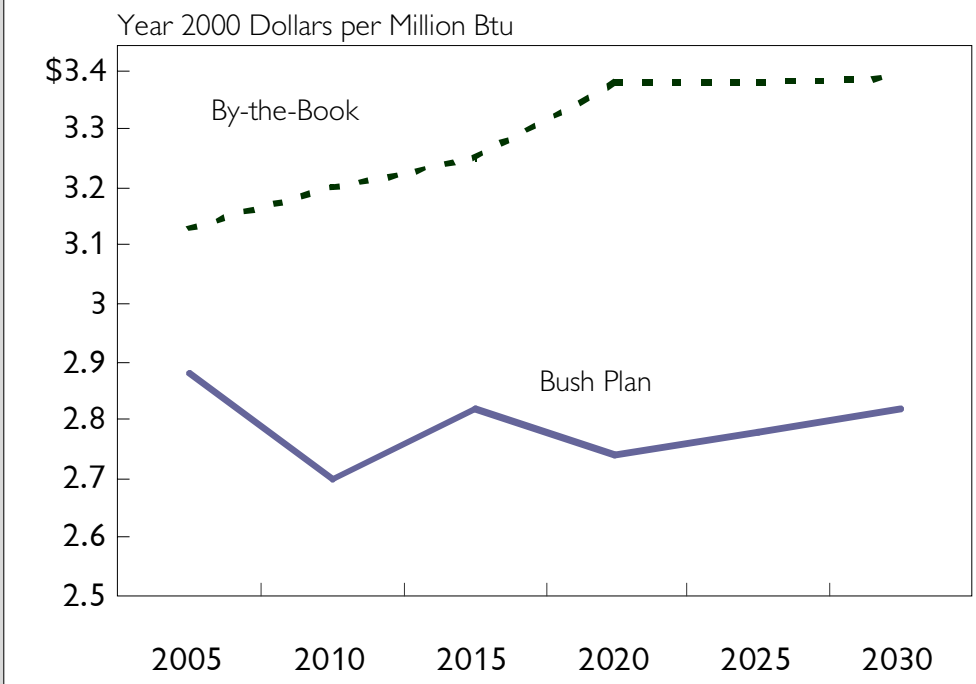
Oil and Gas

These recommendations are intended to increase the nation's available oil and gas supply. They include:

- Promoting enhanced oil and gas recovery from existing wells,
- Providing for increased and /or lower cost access to lands,
- Economic incentives and oil and gas exploration in certain areas,
- Promoting enhanced oil and gas recovery from existing wells.

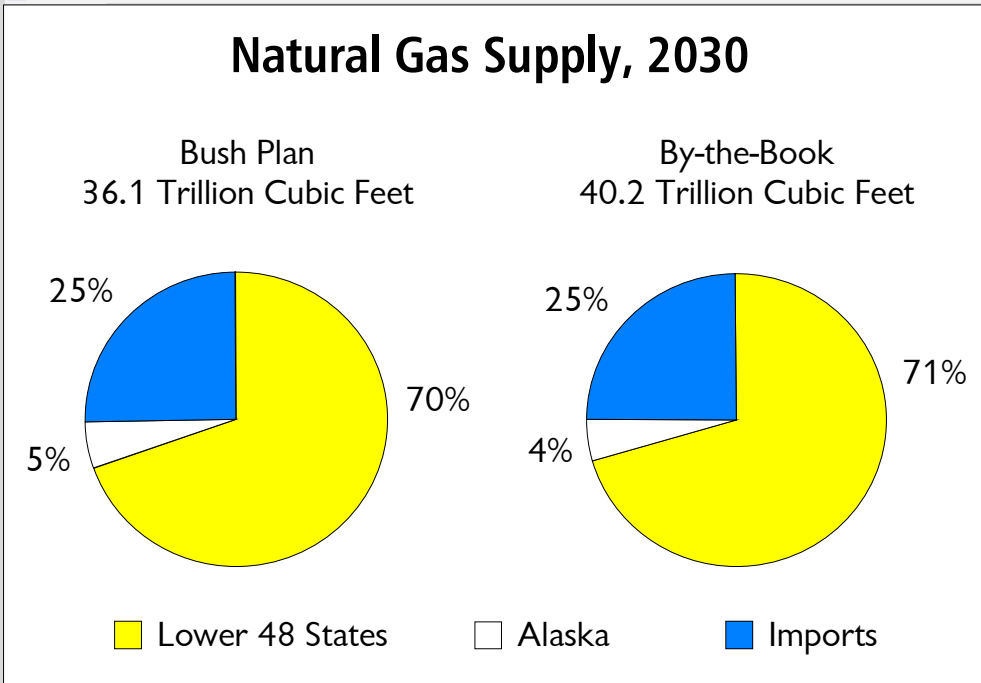
The NEP recommendation is that "The president [should] direct the Secretaries of Energy and the Interior to promote enhanced oil and gas recovery from existing wells through new technology." This could result in re-directing resources from non-energy producing areas to enhanced oil and gas recovery research. Thus, over time, there would be a gradual improvement in oil and gas recovery technology.

Chart 11 CDA 02-01



Source: Center for Data Analysis at The Heritage Foundation and WEFA, Inc.

Chart 12 CDA 02-01



Source: Center for Data Analysis at The Heritage Foundation and WEFA, Inc.

Regarding the lands of the remaining unrecovered natural gas resource base of approximately 1500 Tcf, about 15 percent is either subject to a development moratorium until 2012 or subject to significant limitations on drilling and development. Approximately 2 percent of the unrecovered resource base is located in highly sensitive areas and is therefore not likely to be developed in the foreseeable future. The areas subject to a moratorium on development are largely offshore. These include the areas offshore from the U.S. East Coast (21 Tcf), West Coast (31 Tcf), and portions of the Eastern Gulf Coast (24 Tcf).

WEFA estimates total reserves in the Eastern Gulf of Mexico at approximately 50 Tcf, of which about 24 Tcf are off limits. In addition, other areas offshore account for about 300 Tcf, making the total Gulf of Mexico resources 350 Tcf. The issue of access to this total area, therefore, is about producing just 15 percent of that amount over the next 25 years.

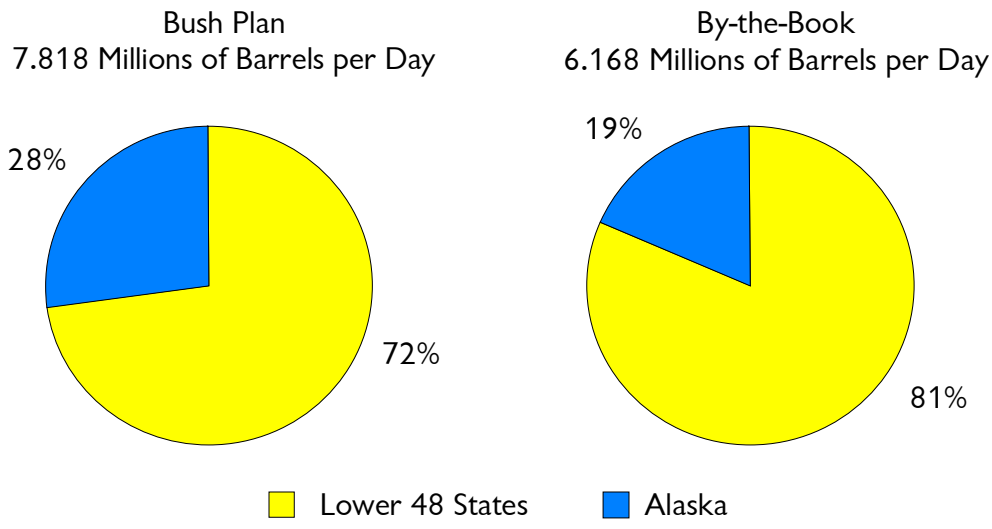
Currently, the only area in the Eastern Gulf of Mexico producing natural gas is the Western Norphlet or Mobile Bay. Federal and state concerns currently preclude the development of the Eastern Norphlet (Destin Dome). However, a development plan has been filed for the Destin Dome and, upon approval, this area could be in production in one to three years. However, the reference case assumes that Destin Dome is not developed. In its projections there is also an area south of the Norphlet area known as Section 181, of which the Administration and the State of Florida recently agreed to make 1.9 million acres available for lease/sale in 2001.

The Rocky Mountain area accounts for approximately 25 percent of the remaining U.S. resource base. About 7 percent of the Rocky Mountain area is inaccessible and 25 percent of Rocky Mountain area resources are subject to delayed development activity that will raise the cost of drilling. WEFA estimates total reserves in the Rocky Mountains at 382 Tcf. The issue of access in this area is about producing just 10 percent of that amount over the next 25 years.

In evaluating the impact of the NEP recommendations regarding the U.S. resource base in the Rocky Mountain area, the Eastern Gulf, Atlantic and Pacific Offshore areas, WEFA has projected access to these areas under the Bush Plan contingent upon agreements between the Administration and the affected state(s). WEFA is not aware of any efforts by the Administration of pursuing any such agreements.

Chart 13 CDA 02-01

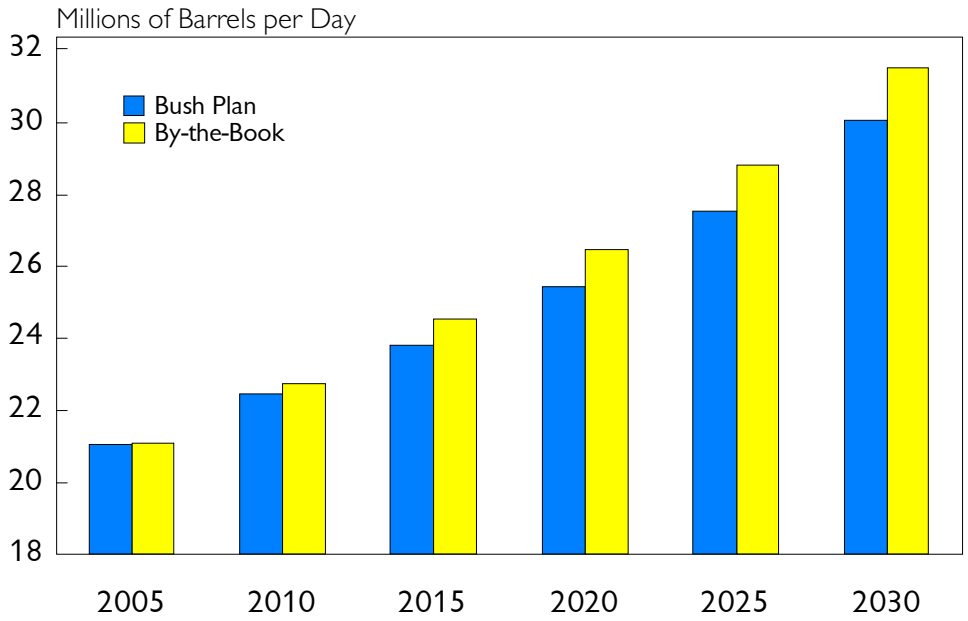
Impact on Domestic Crude Oil Production, 2030



Source: Center for Data Analysis at The Heritage Foundation and WEFA, Inc.

Chart 14 CDA 02-01

Impact on Total Oil Demand



Source: Center for Data Analysis at The Heritage Foundation and WEFA, Inc.

The WEFA analysis, however, is premised on access agreements between the Administration and the states. Accordingly, we have assumed that the Eastern Gulf, Atlantic, and Pacific Offshore areas will be available for lease sale in 2005. We have also assumed that the 25 percent of the Rocky Mountain area subject to high cost will be treated in a manner similar to other areas. This is assumed to reduce the development cost of wells by approximately 5 percent. The table presenting the model implementation below summarizes the three cases. In the by-the-book case, we have reduced access to the Rocky Mountain area to reflect recent efforts of the EIA that would make areas that are off-limits or have restricted access much larger than in the reference case.

Economic Incentives of Oil and Gas Exploration:

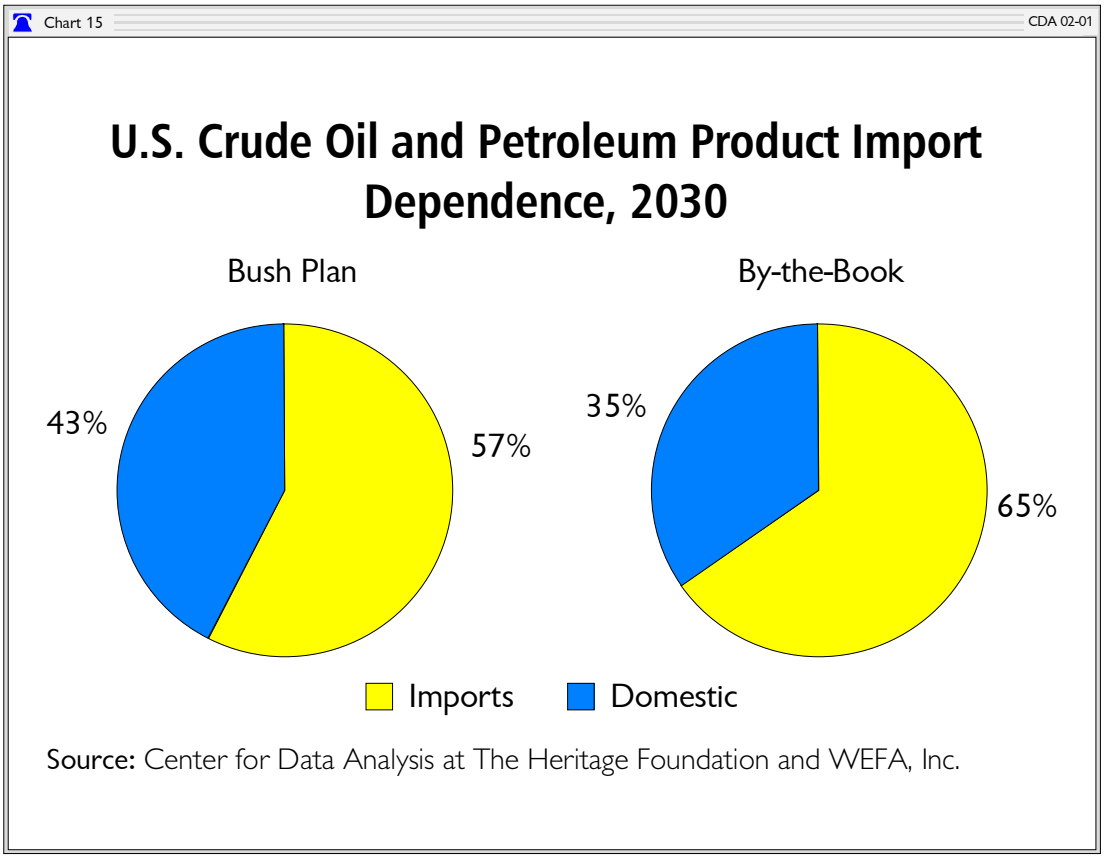
The NEP recommends that the President direct the Secretary of the Interior to consider economic incentives for environmentally sound offshore oil and gas development where warranted by specific circumstances. This would include exploring opportunities for royalty reductions, consistent with ensuring a fair return to the public, where warranted for enhanced oil and gas recovery. In addition economic incentives would be given to reduce the risks associated with production in frontier areas or deep gas formations, and for the development of small fields that would otherwise not be economical.

Royalty reductions have been granted for some time with new leases in the deepwater areas of the central and western Gulf. This recommendation suggests applying this policy to other areas as well. The impact of these recommendations could range from zero (continuation of existing policies) to being very significant, depending on how they are implemented. During the next three or four years, royalty relief is unlikely to have any impact because gas prices are likely to be well above the level needed to stimulate exploration and production, and because of the limited availability of rigs, crews, and experienced geologists.

Measures to Increase Drilling in the United States

Outside of the politically sensitive areas of ANWR and offshore California, the primary obstacles to new oil production in the United States are economic and geological. Many of the NEP proposals will help slightly, but they will not alleviate the high cost of oil production in the United States, nor the shortages of personnel and equipment.

Chart 15 CDA 02-01



For example, improving oil and gas exploration technology will make only a minimal difference from the reference case. The effort to improve exploration technology is a continuation (and perhaps an enhancement) of an effort that was begun in the 1990's under President George H.W. Bush. The intent has been to help smaller, independent companies gain access to newer technologies that lower costs and improve recovery. Although it is difficult to quantify the effects of this effort, it is worth noting that oil production in the lower 48 states stopped declining in 1994 and plateaued thereafter, until the oil price collapse.

Measures such as royalty relief would certainly have an impact, depending on the size of the tax relief. However, it is difficult to estimate the precise impact they may have, and the impact would be minimal. On a global scale, it would be minor, but the slightly higher U.S. oil production would reduce the trade deficit by a few percentage points over the long run.

Impact of Drilling in ANWR and Offshore California

These are the geographic areas where political opposition to drilling is strongest. In the most optimistic case, implementation of the Bush Plan would allow for increased drilling in 2002. As a result, production might be as much as 400 tb/d higher by 2010 (of which 250 tb/d would come from California, conditioned on an agreement between the Administration and the state, and 150 tb/d from ANWR), and 1,500 tb/d higher by 2020 (of which 500 tb/d from California, pursuant to an agreement between the Administration and the state, and 1,000 tb/d would come from ANWR). WEFA is not aware of any efforts by the Administration to pursue drilling in offshore California. The impact on the world oil market would be fairly small. In terms of global production, the increase would be less than 1.25 percent. However, this would be 6 percent of U.S. oil imports in 2010 and 18 percent in 2020, under the most optimistic assumptions, so there would be a moderate macroeconomic impact from the improved trade balance.

However, it is unlikely that the necessary political compromise will be reached that will allow drilling to begin so quickly in these sensitive regions. This affects the estimate for 2010 in particular, as the production growth projected for the early years is quite strong. If drilling begins in 2005, then production in 2010 will still be in the early part of the S-curve representing production, and so could be much lower than anticipated. Such a delay would not affect production projected for 2020, though, since this is a period in which production is expected to plateau.

Nuclear

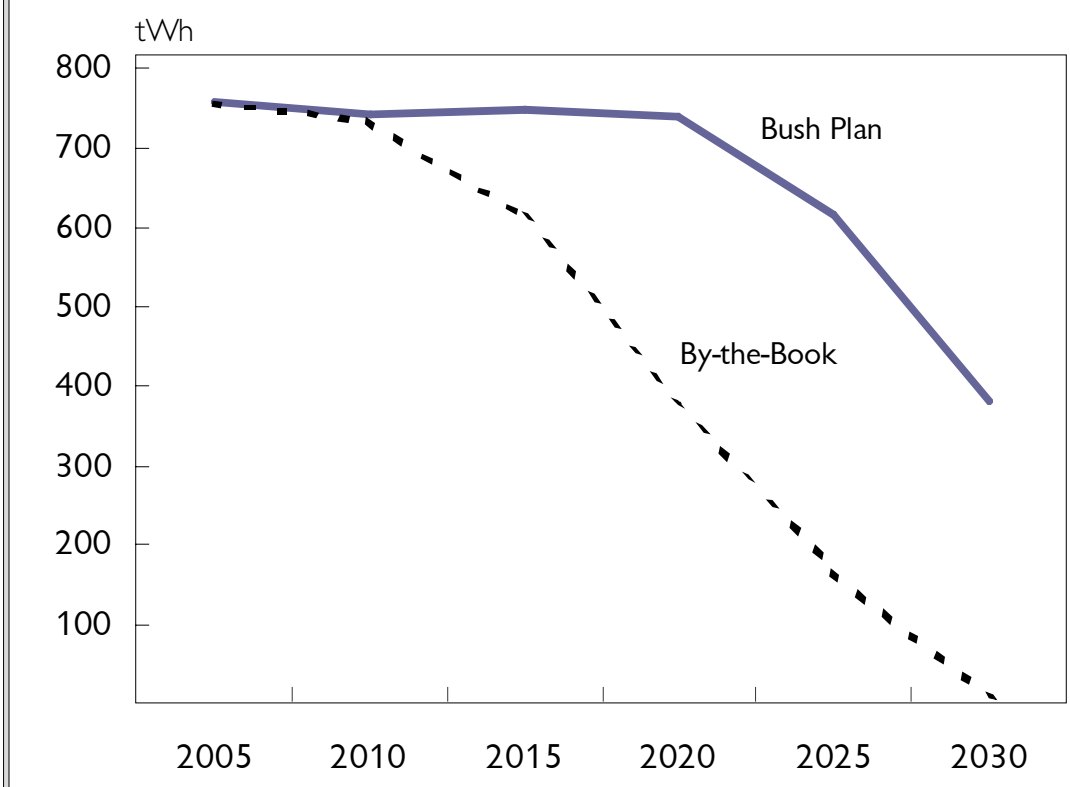
One of the most substantive recommendations of the NEP is that the Price-Anderson Act be extended. The NEP also recommends supporting the expansion of nuclear safety in the United States through safety precautions and expediting applications for licensing new advanced-technology nuclear reactors which have more safety features. The recommendation to improve public education on nuclear safety would support the re-licensing of nuclear power plants.

The reference case assumes that most nuclear power plant licenses will be extended five years. In the Bush Plan it is assumed that these licenses will be extended 10 years. In the by-the-book scenario, nuclear units would not be re-licensed.

Reform Hydro Re-licensing

The reference case assumes all hydro capacity would be relicensed. The Bush Plan would improve the timeliness and reduce the cost of relicensing.

Chart 16 CDA 02-01



Source: Center for Data Analysis at The Heritage Foundation and WEFA, Inc.

Summary

	By-the-Book	Reference	Bush Plan
Resource Access Assumptions[1]			
Rocky Mountain	-60 Bcf 2005 -180 Bcf 2010 -500 Bcf 2015 5% premium for sensitive areas An additional 30 Tcf in sensitive areas is withheld from drilling.	 5% premium for sensitive areas	60 Bcfi2005 180 Bcf 2010 800 Bcf 2015 No premium for sensitive areas beginning in 2005 Access is conditioned upon agreement with affected states. WEFA is not aware of any efforts by the Administration to pursue this area.
Eastern Gulf of Mexico	- 40 Bcf 2005 –400 Bcf 2010 –450 Bcf 2015		60 Bcf 2005 550 Bcf 2010 1000 Bcf 2015
▪ Destin Dome	No Development	No Development	Developed 2002
▪ MMS Lease Sale (section 181)	No Development	Lease Sale: 2001	Lease sale: 2001 (the Administration and the State of Florida recently agreed upon 1.9 million acres).
▪ Other Eastern Gulf	No Development	No Development	Lease sale 2004 Access is conditioned upon agreement with affected states. WEFA is not aware of any efforts by the Administration to pursue these areas.

[1] Note changes in production are with constant prices.

Atlantic and Pacific Offshore	No Development	No Development	Lease sale 2005; 60 Bcf 2010 400 Bcf 2015 250 tb/d by 2010, 500 tb/d by 2020. Access is conditioned upon agreement with affected states. WEFA is not aware of any efforts by the Administration to pursue these areas.
Enhanced Oil and Gas Recovery	Technology advancement continues at rate of recent past	Technology advancement continues at rate of recent past	Technology advancement increases by 0.1% per year over rate of recent past.
Royalty relief program	Current programs continue	Current programs continue	Current programs continue
ANWR	Reference case assumes no access permitted.	Reference case assumes no access permitted.	150 tb/d by 2010, 1 mb/d by 2020.
Clean Coal Technology	Reference Case assumption.	Reference case assumes that new coal units are installed with heat rate of 8500 Btu/kWh in 2005.	Reference Case assumption.
Nuclear	Licenses are not renewed.	Licenses are extended 5 years.	Licenses are extended 10 years.
Hydro	Hydro licenses are extended.	Hydro licenses are extended.	Hydro licenses are extended.

Nature's Power: Increasing America's Use of Renewable and Alternative Energy

NEP Recommends the President:

1. Direct the Secretaries of the Interior and Energy to re-evaluate access limitations to federal lands in order to increase energy production through renewable resources, such as biomass, wind, geothermal, and solar.

2. Include an increase of $39.2 million in the FY 2002 budget amendment for the Department of Energy's Energy Supply account that would provide increased support for research and development of renewable energy resources.

3. Direct the Secretary of Energy to conduct a review of current funding and historic performance of renewable energy and alternative energy research and the development of programs in light of the recommendations of this report. Based on this review, the Secretary of Energy should then be directed to propose appropriate funding for research and development programs that are performance-based and are modeled as public-private partnerships.

4. Direct the Secretary of the Treasury to work with Congress to design legislation to expand the Section 29 tax credit to make it available for new landfill projects for methane. The credit could be tiered, depending on whether or not a landfill is already required by federal law to collect and flare its methane emissions.

5. Direct the Secretary of the Interior to determine ways to reduce the delays in geothermal lease processing as part of the permitting review process.

6. Direct the Administrator of the Environmental Protection Agency to develop a new renewable energy partnership program to help companies more easily buy renewable energy, and receive recognition for the environmental benefits of their purchase, and promote consumer choice programs that increase consumers' knowledge about the environmental benefits of purchasing renewable energy.

7. Direct the Secretary of the Treasury to work with Congress to develop legislation to extend and expand tax credits for electricity produced using wind and biomass. (In addition, the NEP urges the acceptance of the budget request to extend the present 1.7 cents per-kilowatt-hour tax credit for electricity produced from wind and

biomass; expand eligible biomass sources to include forest-related sources, agricultural sources, and certain urban sources; and allows a credit for electricity produced from biomass co-fired with coal.)

8. Direct the Secretary of the Treasury to work with Congress to develop legislation to provide a new 15 percent tax credit for residential solar energy property, up to a maximum credit of $2,000.

9. Direct the Secretaries of the Interior and Energy to work with Congress to develop legislation to use an estimated $1.2 billion of bid bonuses from the environmentally responsible leasing of ANWR to fund research or alternative and renewable energy resources, including wind, solar, geothermal, and biomass.

10. Direct the Secretary of the Treasury to work with Congress to continue the ethanol excise tax exemption.

11. Direct the Secretary of Energy to develop next-generation technology—including hydrogen and fusion, and to

- Develop a public information campaign that communicates the benefits of alternative forms of energy, including hydrogen and fusion.

- Focus research and development efforts on integrating current programs regarding hydrogen, fuel cells, and distributed energy.

- Support legislation reauthorizing the Hydrogen Energy Act.

12. Direct the Secretary of the Treasury to work with Congress to develop legislation to provide for a temporary income tax credit that would be available for the purchase of new hybrid or fuel-cell vehicles between 2002 and 2007.

13. Direct the Administrator of the Environmental Protection Agency to issue guidance to encourage the development of well-designed CHP units that are both highly efficient and have low emissions, and to shorten the time needed to obtain each permit, provide certainty to industry by ensuring consistent implementation across the country, and encourage the use of these cleaner, more efficient technologies.

Analysis

Expanding Section 29 Tax Credit To Make It Available for New Landfill Methane Projects

In 1999 approximately 2.1 million tons of methane were recovered from landfills and used as energy compared to just 0.7 million in 1990.

The Federal Section 29 (of the Internal Revenue Code) tax credit for alternative energy sources, including landfill gas, was added to the tax code as part of the Crude Oil Windfall Profits Act of 1980 and provides an inflation-adjusted credit that currently is equivalent to $6.00 per barrel of oil equivalent of qualified fuels. However, the tax credit for new facilities expired on June 30, 1998, and, absent a similar subsidy, the number of additional landfill gas-to-energy projects that are commercially viable is limited. The extension of these tax credits could result in approximately 0.15 million metric tons of additional methane recovered that could be used for energy from landfills. While subsidies would be helpful, a significant part of this recovery would occur as a result of the EPA's New Source Review Standards and Emission Guidelines, which require all landfills with more than 2.5 million metric tons of waste in place and annual emissions of non-methane volatile organic compounds (NMVOCs) exceeding 50 metric tons to collect and burn their landfill gas, either by flaring or as an energy resource.

Use of Bid Bonuses from ANWR for Research and Development on Renewable Energy Sources

This is clearly an attempt to improve the acceptability of drilling in ANWR by offering a trade off to environmentalists, who are the primary opponents. However, given the virulence of the opposition, the proposal to increase research and development spending for alternative and renewable energies is not likely to lessen the environmentalists opposition to opening up the ANWR for drilling.

The NEP estimates that $1.2 billion would be available in tax credits . Assuming this amount would be spent over a number of years, probably a decade or so, this proposal adds an additional $100 million to $150 million per year in tax credits that would be available. Such an amount is less than has been spent throughout the past two decades, having at most only a marginal impact on the supply of those fuels. This being the case, it is unlikely that the extension of tax credits would have a significant effect.

Continuation of the Ethanol Excise Tax Exemption is assumed in the WEFA's Analysis.

Summary

	By-the-Book	Reference	Bush Plan
Increasing Renewable and Alternative Energy Supplies			
Ethanol Excise Tax Exemption	Reference Case.	Included.	Reference Case.
Landfill Methane Recovered	Grows 0.08 million metric tons per year	Grows 0.08 million metric tons per year	Grows 0.15 million metric tons per year

America's Energy Infrastructure: A Comprehensive Delivery System

NEP Recommends the President:

1. Direct the Secretary of Energy to work with the Federal Energy Regulatory Commission (FERC) to improve the reliability of the interstate transmission system and to develop legislation providing for enforcement by a self-regulatory organization subject to FERC oversight.

2. Direct the Secretary of Energy to expand the department's research and development on transmission reliability and superconductivity.

3. Direct the Secretary of Energy to authorize the Western Area Power Administration to explore relieving the "Path 15" bottleneck through transmission expansion financed by nonfederal contributions.

4. Direct the appropriate federal agencies to take actions to remove constraints on the interstate transmission grid to allow our nation's electricity supply to meet the growing needs of our economy. To this end, he should

- Direct the Secretary of Energy, by December 31, 2001, to examine the benefits of establishing a national grid, identify transmission bottlenecks, and identify measures to remove transmission bottlenecks.

- Direct the Secretary of Energy to work with FERC to relieve transmission constraints by encouraging the use of the incentive of rate making proposals.

- Direct the federal utilities to determine whether transmission expansions are necessary to remove constraints. The Administration should review the Bonneville Power Administration's (BPA's) capital and financing requirements in regard to its membership in a Regional Transmission Operator (RTO), and to ascertain whether additional Treasury financing appears warranted or necessary in the future, the Administration should seek an increase in BPA's borrowing authority.

- Direct the Secretary of Energy, in consultation with appropriate federal agencies and state and local government officials, to

develop legislation to grant the federal government authority to obtain rights-of-way for electricity transmission lines, with the goal of creating a reliable national transmission grid. Similar authority already exists for natural gas pipelines in recognition of their role in interstate commerce.

5. Direct the Secretary of the Interior to work with Congress and the State of Alaska to put in place the most expeditious process for renewal of the Trans-Alaskan Pipeline System lease to ensure that Alaskan oil continues to flow uninterrupted to the West Coast of the United States.

6. Direct the Secretaries of Energy and State, in coordination with the Secretary of the Interior and the Federal Energy Regulatory Commission, to work closely with Canada, the State of Alaska, and all other interested parties to expedite the construction of a pipeline to deliver natural gas to the lower-48 states. This should include proposing to Congress any changes or waivers of law pursuant to the Alaska Natural Gas Transportation Act of 1976 that may be required.

7. Support legislation to improve the safety of natural gas pipelines, protect the environment, strengthen emergency preparedness and inspections, and bolster enforcement.

8. Direct relevant agencies to continue their interagency efforts to improve pipeline safety and expedite pipeline permitting in an environmentally sound manner and encourage FERC to consider improvements in the regulatory process that governs the approval of interstate natural gas pipeline projects.

9. Direct the Administrator of the EPA to study opportunities to maintain or improve the environmental benefits of state and local "boutique" clean fuel programs, and to explore ways to increase the flexibility of the fuels distribution infrastructure, improve fungibility, and provide added gasoline market liquidity. In conducting this study, the Administrator shall consult with the Departments of Energy and Agriculture, and other agencies as needed.

10. Direct the Administrator of the EPA and the Secretary of Energy to take steps to ensure that America has adequate refining capacity to meet the needs of consumers. To that end he should

• Provide more regulatory certainty to refinery owners and streamline the permitting process where possible to ensure that regulatory overlap is limited.

• Adopt comprehensive regulations (covering more than one pollutant and requirement) and consider the rules' cumulative impacts and benefits.

11. Direct the Administrator of the EPA, in consultation with the Secretary of Energy and other relevant agencies, to review New Source Review regulations, including administrative interpretation and implementation, and report to the President within 90 days on the impact of the regulations on investment in new utility and refinery generation capacity, energy efficiency, and environmental protection.

12. Direct the Attorney General to review existing enforcement actions regarding New Source Review to ensure that they are consistent with the Clean Air Act and its regulations.

13. Acquire support for his budget proposal to provide $8 million to maintain the two-million-barrel Northeast Heating Oil Reserve. Operated by the private sector, the reserve helps to ensure that adequate supplies of heating oil in the event that colder than normal winters occur in the Northeast United States.

Analysis

Electricity Restructuring Proposals

An essential component of the NEP recommendations involves the improvement of the nation's electricity infrastructure. With the increasing deregulation of electricity markets, growing emphasis is being placed on the nation's transmission system. In the new scenario, electric power can be generated in virtually any location and then transported to the points of demand. For this process to work, it is essential that the transmission system be reliable.

There are a number of key issues associated with transmission system reliability. One such issue is congestion management. Congestion management must be addressed with regard to the transmission grid. This refers to the management of electricity flow so that the lowest priced electricity can be moved to the markets that need it. Path 15 in California is a case in point. During this past winter, transmission bottlenecks prevented a sufficient electricity flow from Southern California to the northern part of the state where power was desperately needed. It is feared that this situation will be repeated in reverse this summer, as additional power supplies will be required in the future.

Congestion management can be improved in two ways. One way is to improve the flow of electricity within the existing transmission system. This can be accomplished by removing restrictions on the interstate flow of electricity along existing transmission lines. Power suppliers should be granted access to transmission lines at fair and reasonable rates. In addition, regulatory authorities must give utilities an incentive to invest in the maintenance of their transmission systems. Rate structures should make investing in transmission systems as profitable as other utility investments are. Improvement of existing transmission facilities can lead to significant reductions in line losses. Current estimates of line losses are in the 6 percent range. Transmission system upgrades can reduce line losses to the 3 percent range.

The nation's flow of electricity can also be improved by expanding its transmission system. The Secretary of Energy should advocate a national policy of increased rights of way for transmission lines. The process of transmission line siting should be streamlined and the national interest should be the criterion for approval. Tax incentives should be offered to encourage electric utilities to collaborate with telecommunications firms to share transmission facilities. Shared fiber optic cabling will not only improve the reliability of the transmission system but will reduce line losses as well.

Improvement of the nation's transmission system through both better maintenance of the existing system and expansion should be a very high priority of national energy policy. The result will be both increased reliability and lower electricity prices.

WEFA'S electric utility model projects additional capacity requirements in each utility planning region based upon the region's expected generation requirements for the year and the optimal capacity for the region. Optimal capacity is defined as that which would assure a desired reserve margin, while "expected generation" is calculated based upon projected electricity demand, transmission losses, and inter-regional transfers of power. If the optimal capacity calculation implies an increase in generating capacity that is greater than a specified magnitude, then capacity is added to the region.

If the policies advocated above are adopted, transmission losses will be reduced and inter-regional transfers of power will increase. As a result, there will be a reduced need for additional generation, and retail electricity prices will be lower. This will have a pronounced effect in California and the Northeast states that rely upon significant amounts of imported power.

To Augment Refining, the NEP Recommends the Following:

Expedite permitting, develop a multi-pollutant strategy, review New Source Review regulations, and improve fungibility of new clean products

The availability of clean fuels, particularly new petroleum product formulas, has certainly been constrained by the lack of adequate refinery upgrading capacity. The impact has been to increase margins for reformulated gasoline, but this has been done only for brief periods at the local level. During the past year the overall impact has been to add about $4/barrel to the cost of reformulated gasoline, as compared to crude oil.

Obstacles to the construction of new refineries are not the primary problem, however. A combination of refiners' desire to avoid overbuilding their upgrading capacity and the limited availability of qualified engineers and equipment is depressing capacity expansion and upgrading. Uncertainty about regulations regarding upgrading and expansion is another, though smaller, factor in preventing augmented upgrading capacity. More than concerns about New Source Review regulations the higher costs of fuel and labor in the United States have discouraged the construction of new refineries. (OPEC countries typically charge a refinery $.50/Mcf for natural gas.)

The recent petroleum product volatility was due in part to the poorly designed regulations for the use of new petroleum products. The large number of different required formulas (which varied by region and season) has increased regulatory uncertainty and logistical difficulties. The implication behind the NEP recommendation is that these regulations would be redesigned in such a way as to reduce price volatility. If successful, this would prevent the kinds of spikes in margins that have occurred recently. This proposal will improve the situation slightly, and could lower gasoline margins as much as $2 a barrel in the most extreme case.

Summary

	By-the-Book	Reference	Bush Plan
Expanding Energy Infrastructure			
Development of an Independently Operated and Federally Regulated Regional Transmission System	Reference Case	ISO/RTO structure leads to investment in addressing the problem of bottlenecking and limited changes in market interconnection.	ISO/RTO and rate adjustments leads to greater investment and increased linkages between systems, which reduces average line losses from 6% to 3% -- a substantial change in wholesale power requirements.
Refining	Reference Case	Margins are maintained.	Margins are reduced by $2/bbl or 5 cents/gallon.

Strengthening Global Alliances: Enhancing National Energy Security and International Relationships

NEP Recommends the President:

1. Make energy security a priority of U.S. trade and foreign policy.

2. Support initiatives by Saudi Arabia, Kuwait, Algeria, Qatar, the UAE, and other suppliers to open up areas of their energy sectors to foreign investment.

3. Direct the Secretaries of State, Energy, and Commerce work to improve dialogue among energy producing and energy consuming nations.

4. Direct the Secretaries of State, Commerce, and Energy to continue supporting American energy firms competing in markets abroad and use our membership in multilateral organizations, such as the Asia-Pacific Economic Cooperation (APEC) forum, the Organization for Economic Cooperation and Development (OECD), the World Trade Organization (WTO) Energy Services Negotiations, the Free Trade Area of the Americas (FTAA), and our bilateral international relationships to design and implement a system of clear, open, and transparent rules and procedures governing foreign investment to level the playing field for U.S. companies overseas and to reduce barriers to trade and investment.

5. Direct the Secretaries of Commerce and Energy, and the U.S. Trade Representative, to support a sectoral trade initiative to expand investment and trade in energy-related goods and services that will enhance exploration, production, and refining, and the development of new technologies.

6. Direct the Secretaries of State, Treasury, and Commerce to initiate a comprehensive review of sanctions. Energy security should be one of the factors considered in such a review.

7. Direct the Secretaries of State, Commerce, and Energy to engage in a dialogue through the North American Energy Working Group to develop coordinated energy integration among Canada, Mexico, and the United States and to identify areas of cooperation, that are fully consistent with the countries' respective sovereignties.

8. Direct the Secretaries of Energy and State, in consultation with the Federal Energy Regulatory Commission, to review their respective oil, natural gas, and electricity cross-boundary "presidential permitting" authorities, and to propose reforms, as necessary, in order to make their own regulatory regimes more compatible for cross-border trade.

9. Direct the Secretaries of Energy and State, coordinating with the Secretary of the Interior and the Federal Energy Regulatory Commission, to work closely with Canada, the State of Alaska, and all other interested parties to expedite the construction of a pipeline to deliver natural gas to the lower-48 states. This should include proposing to Congress any changes or waivers of law that may be required with regard to the Alaska Natural Gas Transportation Act of 1976.

10. Direct the Secretaries of State and Commerce to conclude negotiations with Venezuela on a Bilateral Investment Treaty and propose formal energy consultations with Brazil to improve the climate for a growing level of energy investment flow between the United States and each of these countries.

11. Direct the Secretaries of Energy, Commerce, and State to work through the Summit of the Americas' Hemispheric Energy Initiative to develop effective and stable regulatory frameworks and foster reliable supply sources of all fuels within the region.

12. Direct the Secretaries of State, Energy, and Commerce to reinvigorate the U.S.-Africa Trade and Economic Cooperation Forum and the U.S.-African Energy Ministerial process; deepen bilateral and multilateral engagement to promote a more receptive environment for U.S. oil and gas trade, investment, and operations; and promote geographic diversification of energy supplies, addressing such issues as transparency, sanctity of contracts, and security.

13. Direct the Secretaries of State, Commerce, and Energy to support more transparent, accountable, and responsible use of oil resources in African producer countries to enhance the stability and security of trade and investment environments.

14. Direct the Secretaries of State, Commerce, and Energy to support the BTC oil pipeline as it demonstrates its commercial viability.

15. Direct the Secretaries of Commerce, State, and Energy to continue working with relevant companies and countries to establish the commercial conditions that will allow oil companies operating in Kazakhstan the option of exporting their oil via the BTC pipeline.

16. Direct the Secretaries of State, Commerce, and Energy to support the efforts of private investors and regional governments to develop the Shah Deniz gas pipeline as a way to help Turkey and Georgia diversify their natural gas supplies and help Azerbaijan export its gas via a pipeline that will continue to diversify secure energy supply routes.

17. Direct appropriate federal agencies to complete the current cycle of oil spill response readiness workshops and to consider further appropriate steps to ensure the implementation of the workshops' recommendations.

18. Direct the Secretary of State to encourage Greece and Turkey to link their gas pipeline systems to allow European consumers to diversify their gas supplies by purchasing Caspian gas.

19. Direct the Secretaries of Commerce, Energy, and State to continue and expand their commercial dialogue with Kazakhstan, Azerbaijan, and other Caspian states to provide a strong, transparent, and stable business climate for the energy commerce and related infrastructure projects.

20. Direct the Secretaries of State, Commerce, and Energy to expand discussions with Russia on energy and the investment climate.

21. Direct the Secretaries of Commerce, State, and Energy to assist U.S. companies in their dialogue with Russian officials on the investment and trade climate to encourage reform of the Production Sharing Agrement law and other regulations and related tax provisions and to promote general improvements in the overall investment climate. This will help expand private investment opportunities in Russia and will increase the international role of Russian firms.

22. Direct the Secretaries of State, Commerce, and Energy to continue to work in the APEC Energy Working Group to examine oil market data transparency issues and the variety of ways in which petroleum stocks can be used as an option to address oil market disruptions.

23. Direct the Secretaries of State and Energy to work with India's Ministry of Petroleum and Natural Gas to help India maximize its domestic oil and gas production.

24. Direct the Secretaries of Commerce, State, and Energy to promote market-based solutions to environmental concerns; support exports of U.S. clean energy technologies and encourage their overseas development; engage in bilateral and multilateral efforts to promote best practices; explore collaborative international basic research and development in energy alternatives and energy-efficient technologies; and explore innovative programs to support the global adoption of these technologies.

25. Direct federal agencies to support continued research into global climate change; continue efforts to identify environmentally safe and cost-effective ways to use market mechanisms and incentives; continue development of new technologies; and cooperate with allies, in international efforts, to develop technologies, market-based incentives, and other innovative approaches to address the issue of global climate change.

26. Strive to increase international cooperation in efforts to identify alternatives to oil, especially in the transportation sector.

27. Direct the Secretary of State to reinvigorate the dialogue with the European Union on energy issues, and to resume the process of consultation this year in Washington.

28. Promote a coordinated approach to energy security by calling for an annual meeting of G-8 Energy Ministers or their equivalents.

29. Make it clear that the SPR is designed to address an imminent or actual disruption in oil supplies, and not for managing prices.

30. Direct the Secretary of Energy to work within the International Energy Agency (IEA) to ensure that member states fulfill their stockholding obligation.

31. Direct the Secretary of Energy to encourage major oil-consuming countries that are not IEA members to consider strategic stocks as an option for addressing potential supply disruptions. In this regard, we should work closely with Asian economies, especially through APEC.

32. Direct the Secretary of Energy to offer to lease excess SPR storage facilities to countries (both IEA members and non-members) that might not otherwise build storage facilities or hold sufficient strategic stocks, in a manner that is consistent with statutory authorities.

33. Determine, at such time the exchanged SPR barrels are returned to the SPR, whether offshore Gulf of Mexico royalty oil deposits to the SPR should be resumed, thereby increasing the size of our reserve.

34. Direct the Secretary of Energy to work closely with Congress to ensure that our SPR protection is maintained.

35. Direct the Secretary of Energy to work with both producer and consumer country allies and the IEA to craft a more comprehensive and timely world oil data reporting system.

Analysis

International Relations

The call for "dialogue" and "consultations" is rather new for the United States, which has long resisted such proposals as representing efforts to manage commodity markets. The many meetings that have been held to date have accomplished very little, and future meetings, (whether IEA/OPEC, G-8 or Western Hemispheric), are not likely to accomplish much more. National self-interest and the conflict of interests between producers and consumers and investors and resource owners usually negate whatever gains (if any) can be made through cooperation. Such proposals will improve the market only to the degree that they improve market transparency and efficiency. To the extent that they encourage governments to manipulate markets, they will result in increased costs and prices.

Encouraging Market Efficiency/Overseas Investments

Several of the NEP recommendations are not new and have proven to be useful. Attempts to improve market transparency are laudable, but do face the obstacle of sovereignty, particularly within OPEC. Many of the members have no desire to have their capacity, production, and/or exports well known. In other areas, data could be improved and this would have a moderate impact on reducing price volatility. However, much of the volatility of prices is due to the nature of commodity markets, not a lack of transparency in oil markets.

Attempts to improve the investment climate are also laudable. After President Nixon's Project Independence task force concluded that making the United States independent from energy imports was ill-advised, focus turned to diversifying the supply available to the world oil market as a whole. To that end, a number of efforts were made to encourage upstream investment around the globe; notably, advice was given to Third World countries on the appropriate structure of contracts. The general move towards economic liberalization has made it easier for multinational oil companies to invest overseas and has resulted in a boom in non-OPEC production over the past two decades.

At present, though, the international oil industry is not lacking access on a global level. There are countries such as India and Brazil that are still somewhat restrictive, but most oil companies have numerous opportunities for investment. Better risk insurance and improved operating terms would provide small improvements in drilling and production outside of the United States and OPEC. Most other policies, such as technology transfer, would have only a marginal impact.

Thus, the overall effect of this group of proposals would be to slightly improve upstream investment opportunities, and enhance diversification of supply to the oil market.

SPR Policy

The NEP has wisely reaffirmed the nation's commitment to reliance on the SPR for energy security. The NEP also insists that the SPR not be used for managing prices. It is assumed that this is a reiteration of the long-standing government policy (and IEA policy) that oil should not be released during a supply disruption unless there are actual physical shortages. This was the policy during the Gulf War. Supplies were not released as prices passed $30/bbl in late 1990, but were released in early 1991 when the bombing started.

Efforts to bolster the SPR's utility by leasing surplus capacity to other nations and augmenting it by using royalty oil have the potential to improve the world's energy security. However, the overall impact will not be very large; the world already has upwards of 1.5 billion barrels of strategic reserves. Adding even a few hundred million barrels will not affect the market very much, although it will provide added deterrence against an attempted embargo.

The Baku-Ceyhan Pipeline

The report suggests that the Administration should continue the previous Administration's support for the BTC pipeline. The oil from the Caspian will certainly find its way to world markets, with or without the help of the U.S. government. The only question is whether the U.S. would help or hinder the prompt development of export routes by seeking to influence those routes. In our analysis, the Administration's actions will not substantially affect the world price of crude oil on average over the long-term.

Summary

	By-the-Book	Reference	Bush Plan
Strengthening Global Alliances			
International Relations	Reference Case	Reference Case	Brings on small increase in non-OPEC production, not enough to change global oil balance or global oil price.

3. Economic Assessment of the Bush Energy Plan

Impact on the Energy Sector

Introduction

The implementation of the myriad programs and policies in the Bush Administration's National Energy Plan would reduce energy use and provide increased energy supplies. As a result, energy prices would be moderate and economic performance would improve.

The impact of the integrated analysis on the outlook for the energy sector presented below focuses on the difference between the Bush Plan and the by-the-book scenario.

Impact on Electricity Markets

Demand

Demand for electricity will be reduced under the Bush Plan through a number of measures, including:

- The expansion of the Weatherization Program,
- The extension and expansion of the Energy Star program,
- The extension and expansion of the appliance programs, and
- Incentives for CHP, which would result in reduced demand for power from central facilities.

As these are all existing programs, the impact over the next five years will be small. However, over the longer term, the impact will compound. The electricity savings from extending and expanding these programs extensions are shown below.

Impact on Electricity Consumption

	2005	2010	2015	2020	2025	2030
Sales (TWh)						
By-the-Book	3904.8	4399.4	4858.0	5378.3	5970.7	6603.2
Bush Plan	3878.2	4341.1	4767.1	5247.6	5792.3	6371.7
Pct. Difference	-0.7%	-1.3%	-1.9%	-2.4%	-3.0%	-3.5%

Generation

Power generation requirements exceed consumption by the amount of electricity used in production, transmission and distribution. Electricity line losses during transmission are substantial. The Bush Plan includes the development of independently owned and operated Independent System Operator/Regional Transmission Organizations. This measure is designed to spur investment in upgrading and expanding transmission. WEFA estimates that this measure would ultimately reduce average line losses substantially. Shown below is the impact of the electricity efficiency measures and the improvements in transmission and distribution.

Impact on Electricity Generation

	2005	2010	2015	2020	2025	2030
Generation (TWh)						
By-the-Book	4308.9	4887.4	5411.3	5992.4	6654.7	7361.7
Bush Plan	4267.6	4744.1	5152.5	5673.0	6263.8	6892.3
Pct. Difference	-1.0%	-2.9%	-4.8%	-5.3%	-5.9%	-6.4%

Capacity

Electric generation capacity is critical to the country's future. For the last two decades, the United States has had a surplus of generating capacity. Over the next decade, many regions will need to build capacity to meet generation requirements. The reduction in generation requirements because of improved appliance and transmission efficiency that result from the Bush Plan will help to alleviate some of these requirements, as shown below.

Impact on Power Generation Capacity

	2005	2010	2015	2020	2025	2030
Capacity (GW)						
By-the-Book	906.5	987.6	1084.2	1191.2	1312.8	1441.3
Bush Plan	906.5	962.5	1033.3	1129.5	1237.3	1351.4
Pct. Difference	0.0%	-2.5%	-4.7%	-5.2%	-5.7%	-6.2%

Capacity by Fuel Type

Coal

Producers of electric power have been looking to natural gas to meet incremental generation requirements. However, with the imminent imposition of stricter NOx standards in 2004 and the likely tightening of SO_2/PM standards later in the decade, the prospect of even greater reliance on natural gas has grown. The recent run-up in natural gas prices and the tightness of gas supplies has led the Bush Administration to propose measures to alleviate some of the limitations on power generation and the need to build new capacity.

The WEFA analysis has assumed that Congress delays the imposition of the NOx standards and the tightening of SO_2 and PM standards for two years from 2004 to 2006. Further, the WEFA analysis assumes that the New Source Review program will once again allow utilities to engage in routine maintenance activities without triggering NSR.

If implemented, these proposals would have a substantial impact on available coal generation capacity. All coal capacity is old and most could be expanded. Even moderate spending on operation and maintenance (O&M) would increase capability. Over the past five years, owners of aging coal generators have not invested in O&M because this has often been subject to burdensome NSR regulations. The Bush Plan would encourage reasonable expenditures on O&M that would result in modest increases in coal generating capability.

A two year delay in the imposition of the tighter environmental standards would alleviate the growing concern that these standards will create a temporary shortage in capacity as required pollution abatement equipment is added.

These measurers would reduce spikes in electricity prices since incremental investment in gas-fired generation would keep pace with incremental demand for electric energy.

Impact on Coal Capacity, Generation and Fuel Demand

	2005	2010	2015	2020	2025	2030
Coal Capacity (GW)						
By-the-Book	316.7	335.8	372.8	432.5	494.5	555.4
Bush Plan	329.3	338.6	357.9	392.1	434.3	484.6
Pct. Difference	4.0%	0.8%	-4.0%	-9.3%	-12.2%	-12.8%
Coal Generation (TWh)						
By-the-Book	2067.8	2263.5	2578.4	3063.8	3559.3	4046.5
Bush Plan	2138.8	2282.9	2476.4	2775.2	3123.6	3529.6
Pct. Difference	3.4%	0.9%	-4.0%	-9.4%	-12.2%	-12.8%
Coal Demand for Power Generation (Q Btu)						
By-the-Book	21.6	23.2	25.3	28.8	32.1	35.3
Bush Plan	22.4	23.5	24.7	26.7	29.0	31.6
Pct. Difference	3.4%	1.4%	-2.6%	-7.2%	-9.8%	-10.5%

Nuclear

The Bush Plan also calls for improvements in nuclear safety, expediting the nuclear relicensing process and the extension of the Price-Anderson Act. These measures are expected to improve the life expectancy of current nuclear capacity and to encourage the introduction of a new generation of nuclear capacity in the long run. The reference case assumes that most nuclear licenses will be extended five years. The by-the-book case assumes nuclear plants will be shut down when their license expires.

Impact on Nuclear Capacity and Generation

	2005	2010	2015	2020	2025	2030
Nuclear Capacity (GW)						
By-the-Book	95.7	92.0	76.4	47.4	20.4	0.6
Bush Plan	95.7	93.1	93.1	92.0	76.4	47.4
Pct. Difference	0.0%	1%	22%	94%	274%	7402%
Nuclear Generation (TWh)						
By-the-Book	758.2	733.3	611.4	381.3	163.5	4.9
Bush Plan	758.2	741.9	746.2	740.3	616.2	383.5
Pct. Difference	0.0%	1%	22%	94%	277%	7796%

Hydro and Other Renewables

The Bush Plan includes measures to expedite and encourage hydro relicensing and the development of other renewable generating capability. Due to the importance of hydro generation in meeting regional energy demands, WEFA had already assumed that these measures would be pursued and implemented. Additionally, WEFA had already assumed an increase in other renewable generating capability as most states have similar initiatives in place.

Petroleum

WEFA's assumption that Congress will delay implementation of some of the environmental standards might also improve the outlook for oil use in power generation. However, the prime factor influencing the United States' ability to maintain its oil capacity is the current restriction on emissions influencing the ozone between May and September. Most oil capacity is in the eastern region of the country where these rules apply and these regulations limit power generators' interest in this type of capacity.

Natural Gas

Natural gas is projected to play an increasing role in power generation. In addition to its relatively benign environmental impact, the new generation of gas combined cycle units and advanced gas turbines is much more efficient. As a result, natural gas is expected to (1) meet some the incremental increase in demand for base and intermediate load generation in selected regions and (2) replace some of the aging coal and oil capacity that is now used to meet intermediate and peaking load requirements. It is worthwhile to note that this capacity is only being replaced because of tighter environmental standards. Without those standards, this aging capacity would continue to be the economical choice.

The projections below are based on an assumption of adequate availability of natural gas at a reasonable price. Although gas is more expensive than coal, and even more expensive than oil episodically, the efficiency of the new units in combination with its lower emissions results in an increasing demand for natural gas.

The recent price run-up for natural gas and concerns about its long-term availability at a reasonable price has undermined investors' confidence in this outlook. The Bush Plan proposes several measures to restore the availability of natural gas at a reasonable price. These measures are expected to take several years to complete. A delay in the imposition of tighter environmental standards would result in a reduced role for natural gas in power generation.

Impact on Natural Gas Capacity, Generation and Fuel Demand

	2005	2010	2015	2020	2025	2030
Natural Gas Capacity (GW)						
By-the-Book	318.6	392.2	470.5	542.9	624.1	703.9
Bush Plan	306.0	363.2	417.8	477.0	552.7	638.0
Pct. Difference	-4.0%	-7.4%	-11.2%	-12.1%	-11.4%	-9.4%
Natural Gas Generation (TWh)						
By-the-Book	1013.9	1437.9	1759.4	2062.9	2416.2	2752.3
Bush Plan	906.9	1266.6	1467.8	1673.0	2008.3	2421.2
Pct. Difference	-10.6%	-11.9%	-16.6%	-18.9%	-16.9%	-12.0%
Natural Gas Demand for Power Generation (Q Btu)						
By-the-Book	8.6	10.7	12.5	14.0	15.6	17.1
Bush Plan	7.9	9.6	10.6	11.6	13.2	15.1
Pct. Difference	-8.1%	-10.5%	-14.8%	-17.1%	-15.7%	-11.9%

Retail Electricity Prices

The Bush Plan includes many measures to alleviate potential shortages of electricity, encourage long-term developments to allow power to flow between regions, and reduce the cost of generating power. If implemented these measures would reduce the price of electricity to consumers.

Impact of Bush Plan on Retail Electricity Prices

	2005	2010	2015	2020	2025	2030
Residential (cts/kWh)						
By-the-Book	9.4	10.2	11.3	12.7	14.1	15.6
Bush Plan	9.3	10.0	11.1	12.3	13.7	15.2
Pct. Difference	-1.1%	-1.8%	-1.9%	-2.9%	-2.9%	-2.6%
Commercial (cts/kWh)						
By-the-Book	7.8	8.5	9.3	10.3	11.4	12.6
Bush Plan	7.7	8.3	9.2	10.1	11.1	12.3
Pct. Difference	-1.1%	-1.8%	-1.8%	-2.8%	-2.7%	-2.1%
Industrial (cts/kWh)						
By-the-Book	4.6	5.0	5.4	5.9	6.4	7.0
Bush Plan	4.5	4.8	5.2	5.6	6.1	6.7
Pct. Difference	-1.7%	-2.8%	-3.0%	-4.7%	-4.5%	-3.7%

Impact on Natural Gas Markets

Demand

WEFA's analysis includes several proposals that would reduce the growth in natural gas consumption. Delaying the imposition of tighter environmental standards and excluding routine maintenance activities from NSR regulations reduces the requirements for natural gas. The longer term use of natural gas in this sector increases at a slower, but steady pace.

Consumption in the other energy sectors is projected to rise slowly under the Bush Plan. Implementation of programs that provide incentives for efficiency slows growth. As supply is increased through initiatives such as reducing barriers to drilling on federal lands and offshore areas, the price of natural gas is projected to decline substantially compared to the by-the-book case. The return of reasonably priced gas results in enough consumption to more than offset the impact of the efficiency measures.

Under the by-the-book case, consumption for gas generation will grow strongly because nuclear power plants will be shut down when their license expires. However, higher natural prices will cause reductions in gas consumption in the other sectors. Also, in the latter years of the analysis, high natural gas prices cause much of the new power generation to be from coal.

Natural Gas Demand under Alternative Cases

	2005	2010	2015	2020	2025	2030
Power Generators (Q Btu)						
By-the-Book	8.6	10.7	12.5	14.0	15.6	17.1
Bush Plan	7.9	9.6	10.6	11.6	13.2	15.1
Pct. Difference	-8.1%	-10.5%	-14.8%	-17.1%	-15.7%	-11.9%
Res/Com/Ind (Q Btu)						
By-the-Book	14.9	15.6	16.2	16.8	17.5	18.2
Bush Plan	15.0	15.8	16.4	17.2	17.9	18.7
Pct. Difference	0.7%	1.1%	1.6%	2.1%	2.3%	2.6%
Total (Q Btu)						
By-the-Book	23.4	26.3	28.7	30.8	33.2	35.3
Bush Plan	22.9	25.4	27.1	28.8	31.1	33.8
Pct. Difference	-2.5%	-3.6%	-5.5%	-6.6%	-6.2%	-4.4%

Supply

The Bush Plan includes several initiatives designed to rebuild the country's readily producible reserves of natural gas. Measures to increase access to federal lands and offshore areas are coupled with incentives for research and development. In addition, the Bush Plan supports the development of the Alaskan Natural Gas Transmission System (ANGTS).

Higher prices are making an impact now. After years of surplus capacity and low prices, prices have risen sharply over the past two years. Producing natural gas has a long lead time, and it is just now that the effects of the high prices of the last year are having effect. The combination of somewhat higher prices, greater access, and investment in research and development are projected to improve the outlook for gas supply.

Under the Bush Plan, the increased access to gas supply resources from the lower 48 and lower consumption from NSR lowers natural gas prices and delays the economic attractiveness of supplies from Alaska and the McKenzie Delta. In the by-the-book case these

supplies begin flowing in the second half of 2008. Under the Bush Plan they are delayed until after 2015. Access to supply, primarily in the Rockies, is reduced in the by-the-book case. However, the total supply increases in the by-the-book case because of higher prices.

Natural Gas Supply under Alternative Cases

	2005	2010	2015	2020	2025	2030
Total (Tcf)						
By-the-Book	26.2	29.5	32.5	35.1	37.6	40.2
Bush Plan	24.6	27.0	28.8	30.7	33.2	36.1
Pct. Difference	-2.6%	-3.6%	-5.5%	-6.6%	-6.2%	-4.5%
Lower 48 (Tcf)						
By-the-Book	21.0	22.6	24.3	25.9	27.8	28.2
Bush Plan	19.6	21.4	22.9	22.6	24.4	25.1
Pct. Difference	-6.4%	-7.3%	-9.1%	-13.0%	-12.3%	-11.2%
Alaska (Tcf)						
By-the-Book	0.4	0.9	1.4	1.8	1.8	1.8
Bush Plan	0.4	0.4	0.5	1.8	1.8	1.8
Pct. Difference	0.0%	-55.6%	-64.3%	0.0%	0.0%	0.0%
Imports (Tcf)						
By-the-Book	4.8	6.0	6.8	7.4	8.0	10.2
Bush Plan	4.6	5.2	5.4	6.3	7.0	9.2
Pct. Difference	17.9%	14.9%	12.5%	23.9%	21.5%	19.2%

Prices

Under the Bush Plan natural gas prices decrease because of increased access to the resource base and reduced natural gas consumption. The lower prices delay the use of supplies from Alaska and the McKenzie Delta. The reduced supplies from Alaska and the McKenzie Delta offsets some of the price decrease from the increased supply from the lower 48 and reduced consumption.

Natural Gas Prices under Alternative Cases

	2005	2010	2015	2020	2025	2030
Henry Hub (2000$/mmBtu)						
By-the-Book	3.13	3.20	3.25	3.38	3.38	3.39
Bush Plan	2.88	2.70	2.82	2.74	2.78	2.82
Pct. Difference	-7.9%	-15.7%	-13.3%	-18.7%	-17.8%	-16.9%
Delivered to Power Generators (2000$/mmBtu)						
By-the-Book	3.49	3.59	3.65	3.82	3.80	3.86
Bush Plan	3.24	3.09	3.22	3.17	3.19	3.29
Pct. Difference	-7.1%	-14.1%	-11.9%	-17.0%	-15.9%	-14.9%

Impact on Coal Markets

Coal demand is projected to increase under the Bush Plan. The country relies on coal for the major part of its power generation. WEFA's analysis, which assumes a delay in the tightening of environmental standards and an exclusion of routine maintenance activities from NSR, projects an increase coal capacity in the near term. Once increased, this capacity is projected to remain in service for several decades. As a result, coal consumption hits new highs.

Although demand increases in the short term, the growth in coal slows under the Bush Plan as nuclear capacity remains in use and electric energy consumption grows at a slower pace.

Under the Bush Plan, the slower growth in coal consumption and the easing of restrictions on access to coal supplies results in lower prices of coal at the mine-mouth.

Coal Demand under Alternative Cases

	2005	2010	2015	2020	2025	2030
Demand (Q Btu)						
By-the-Book	23.32	24.80	26.91	30.29	33.61	36.74
Bush Plan	24.06	25.13	26.26	28.21	30.44	33.02
Pct. Difference	3.1%	1.3%	-2.4%	-6.9%	-9.4%	-10.1%
Production (Q Btu)						
By-the-Book	24.09	25.68	27.73	31.02	34.23	37.30
Bush Plan	24.74	26.05	27.15	29.01	31.14	33.63
Pct. Difference	2.7%	1.4%	-2.1%	-6.5%	-9.0%	-9.8%
Mine-mouth Price, Avg. ($/mmBtu)						
By-the-Book	0.754	0.742	0.710	0.673	0.651	0.622
Bush Plan	0.754	0.738	0.706	0.668	0.646	0.616
Pct. Difference	0.0%	-0.5%	-0.6%	-0.7%	-0.8%	-1.0%
Delivered to Power Generators ($/mmBtu)						
By-the-Book	1.16	1.14	1.11	1.07	1.06	1.02
Bush Plan	1.16	1.13	1.10	1.07	1.05	1.01
Pct. Difference	0.0%	-0.8%	-0.8%	-0.8%	-0.9%	-0.9%

Impact on Oil Markets

Demand

Demand for oil will be reduced with the implementation of measures aimed at conservation, efficiency, and the use of alternative fuels. The measures will largely affect the use of oil for transportation and heating. They include:

- The expansion of weatherization,
- Incentives for CHP, which will result in reduced demand for power from central facilities,
- Review of CAFE standards,
- Tax Credit for fuel-efficient vehicles
- Income Tax Credit for the purchase of new-hybrid or fuel cell vehicles

The impact of these initiatives is projected to be small over the next five years. However, over the longer term, the impact will compound. The effects will be felt mainly by the electric utility and transportation sectors. The reductions in oil use from these program extensions are shown below.

Impact on Petroleum Demand

	2005	2010	2015	2020	2025	2030
Total Oil Demand (tb/d)						
By-the-Book	21089	22719	24499	26483	28805	31495
Bush Plan	21054	22415	23823	25459	27527	30073
Pct. Difference	-0.2%	-1.3%	-2.8%	-3.9%	-4.4%	-4.5%
Gasoline Demand (trillion Btu)						
By-the-Book	17328	18731	19876	20885	21945	23058
Bush Plan	17557	18422	18874	19237	19833	20700
Pct. Difference	0.2%	-3.1%	-6.4%	-9.2%	-11.0%	-11.6%

Although the two programs that offer incentives to high efficiency vehicles and hybrids would reduce energy consumption, the impact is expected to be small. These programs principally offer incentives to the vehicle manufacturers to produce these vehicles. High-efficiency and hybrid cars are expensive to produce, and most consumers are reluctant to buy vehicles based on new technology. These programs offer an incentive to both manufacturers and consumers to invest in new technology.

WEFA believes that the review of the CAFE standards, however, would make a significant impact. Currently, the National Academy of Sciences is reviewing CAFE standards. In addition, vehicle manufacturers have stated that they can – and will – improve the fuel economy of their sport utility vehicles (SUVs) and minivans by 20 percent or more over the next five years. This would mean that new light trucks sold as passenger vehicles would achieve a 25 mpg on-road rating by 2010. Further, WEFA assumes that, vehicle manufacturers will make continued improvements in SUV fuel economy over the longer term.

This voluntary effort on the part of the vehicle manufacturers will significantly reduce U.S. oil consumption, reduce emissions, and reduce U.S. dependence on foreign oil suppliers.

Supply

Oil supply will increase under the Bush Plan. The opening of ANWR for drilling would increase crude production by 150 thousand barrels per day by 2010 and one million b/d by 2020. If drilling were permitted in offshore California, crude production would rise by another 250 thousand barrels per day in 2010, and 500 thousand barrels per day in 2020. Supply will be further enhanced by slightly faster technology advancement than in the reference case.

Impact on Crude Oil Production

	2005	2010	2015	2020	2025	2030
Lower 48 (Th b/d)						
By-the-Book	4965.1	5065.2	5167.3	5271.5	5141.0	5013.8
Bush Plan	4995.1	5315.2	5542.3	5771.5	5716.0	5663.8
Pct. Difference	0.6%	4.9%	7.3%	9.5%	11.2%	13.0%
Alaskan (Th b/d)						
By-the-Book	1062.4	1167.3	1282.5	1238.2	1195.5	1154.2
Bush Plan	1062.4	1367.3	1982.5	2238.2	2195.5	2154.2
Pct. Difference	0.0%	17.1%	54.6%	80.8%	83.7%	86.6%
Total US (Th b/d)						
By-the-Book	6028	6232	6450	6510	6336	6168
Bush Plan	6058	6682	7525	8010	7911	7818
Pct. Difference	0.5%	7.2%	16.7%	23.0%	24.9%	26.8%

Refining Capacity

Under the Bush Plan, more oil refining capacity will be built, ensuring that America has adequate refining capacity to meet the needs of consumers. The country has become increasingly dependent on imports of petroleum products. As the United States has imposed more constraints on petroleum product specifications (in general and by region) and has constrained improvements in refining through the New Source Review process, petroleum product availability has been reduced.

To rectify this problem, the Bush Plan proposes to provide more regulatory certainty to refinery owners and streamline the permitting process where possible. The intended result is to increase U.S. refining, allowing investment to produce petroleum products that meet environmental standards.

In concert with this initiative, WEFA assumes that the Bush Administration will pursue a review of the necessity for the large number of petroleum product specifications that are in place today, with an eye toward significantly reducing the number.

Impact on Oil Refining Capacity

	2005	2010	2015	2020	2025	2030
Capacity (tb/d)						
By-the-Book	16644	16979	17322	17671	18027	18391
Bush Plan	16852	17407	17980	18572	19184	19815
Pct. Difference	1.3%	2.5%	3.8%	5.1%	6.4%	7.7%

Gasoline Prices

The Bush Plan will result in reduced price volatility, which has been caused by the regulations imposed on refiners to produce and sell "boutique fuels." By increasing the flexibility of the fuels distribution infrastructure, improving fungibility, and providing more liquidity to the gasoline market, the plan would give refiners greater options to satisfy demand requirements. This would reduce gasoline margins by as much as $2 per barrel by 2010.

Impact on Gasoline Prices

	2005	2010	2015	2020	2025	2030
Gasoline, Pump (2000 cts/gal)						
By-the-Book	131.4	131.7	134.9	136.8	141.8	143.2
Bush Plan	126.3	126.7	129.8	131.8	136.7	138.2
Pct. Difference	-3.9%	-3.8%	-3.8%	-3.7%	-3.6%	-3.5%

Imports

The net impact of the Bush Plan would reduce U.S. dependence on foreign oil supplies.

Outlook for U.S. Crude and Petroleum Product Imports

	2005	2010	2015	2020	2025	2030
Imports (tb/d)						
By-the-Book	11111	12388	13733	15475	17779	20438
Bush Plan	11022	11587	11908	12849	14795	17203
Pct. Difference	-0.8%	-6.5%	-13.3%	-17.0%	-16.8%	-15.8%
Import Dependence (%)						
By-the-Book	52.7%	54.5%	56.1%	58.4%	61.7%	64.9%
Bush Plan	52.4%	51.7%	50.0%	50.5%	53.7%	57.2%

Impact on Total Demand for Energy

The impact on total energy requirements is substantial. Under the Bush Plan, by 2030, total energy consumption will be nearly 2.8 percent below the by-the-book case. This is enough energy to run almost 40 million homes for a year. The programs and policies of the Bush Plan will reduce energy use, improve supply availability, provide access to lower cost reserves and significantly reduce the price of energy to consumers.

Impact On U.S. Energy Consumption

	2005	2010	2015	2020	2025	2030
Total Energy Consumption (Q Btu)						
By-the-Book	104.49	112.06	119.29	127.08	136.03	146.16
Bush Plan	104.49	110.85	117.04	124.64	132.98	142.01
Pct. Difference	0.0%	-1.1%	-1.9%	-1.9%	-2.2%	-2.8%

Macroeconomic Effects

Heritage economists used the WEFA U.S. Macroeconomic Model to conduct a dynamic simulation of President Bush's energy plan. In particular, Heritage economists reconstructed WEFA's March 2001 long-term model to incorporate the latest baseline energy assumptions developed by the WEFA's energy group.

The energy efficiency, conservation, supply, and distribution proposals in the President's energy plan decrease the relative prices of electricity, natural gas, coal, and oil. These favorable price changes coupled with a decrease in dependence on foreign oil increase consumer confidence, stimulate economic growth, and enhance job opportunities. Since the President's plan is not a quick fix, the greatest energy and economic effects are felt in the long run.

Specifically, the CDA dynamic analysis projects that the Bush Plan would:

- **Increase economic growth**. In 2025, GDP (adjusted for inflation) would be $540 billion higher than the by-the-book forecast. The rate of economic growth would increase by an average of 0.1 percentage point per year from 2005 to 2025.

- **Create more job opportunities**. By 2025, over 1.5 million more Americans would be working compared with the by-the-book forecast. Moreover, the unemployment rate would average just 4.8 percent from 2005 to 2025 under the Bush Plan, while the by-the-book projection would be 5.1 percent.

- **Increase family income**. By 2030, lower energy prices and higher economic growth increase the disposable personal income for an average family of four (adjusted for inflation) by $1,828.

- **Increase investment**. Investment (adjusted for inflation) would increase by an average of $65 billion per year from 2005 to 2025. By the end of 2025, the net capital stock would be $1.4 trillion higher under the Bush Plan.

- **Maintain relative price levels and interest rates**. Lower energy prices would be offset by stronger economic growth so there would be no significant change in inflation or interest rates between 2002 and 2025.

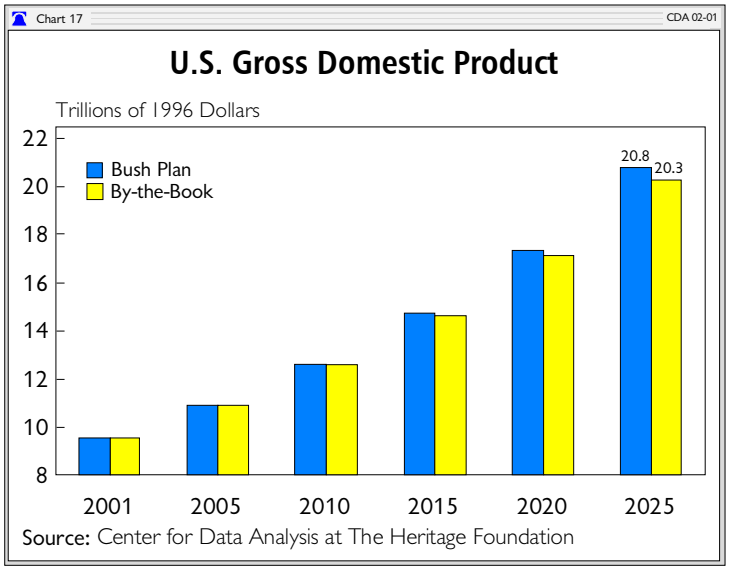


Chart 17
CDA 02-01
U.S. Gross Domestic Product
Trillions of 1996 Dollars
22
20
18
16
14
12
10
8
Bush Plan
By-the-Book
20.8
20.3
2001
2005
2010
2015
2020
2025
Source: Center for Data Analysis at The Heritage Foundation

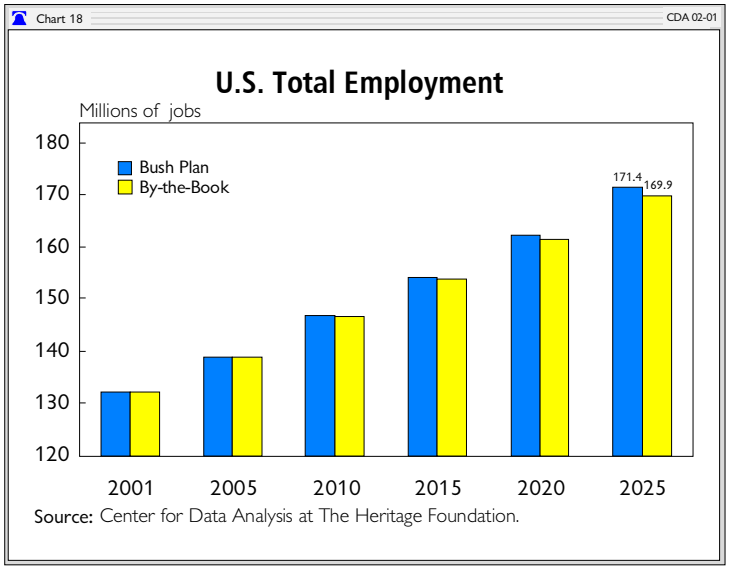


Chart 18
CDA 02-01
U.S. Total Employment
Millions of jobs
180
170
160
150
140
130
120
Bush Plan
By-the-Book
171.4
169.9
2001
2005
2010
2015
2020
2025
Source: Center for Data Analysis at The Heritage Foundation.

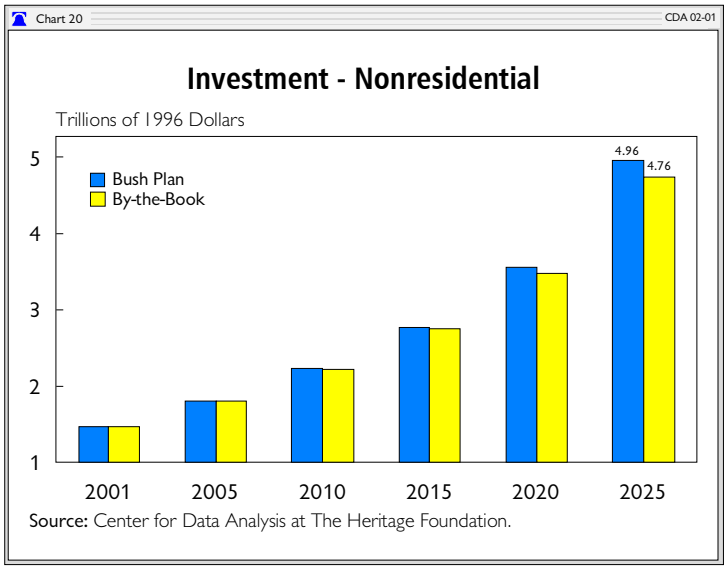
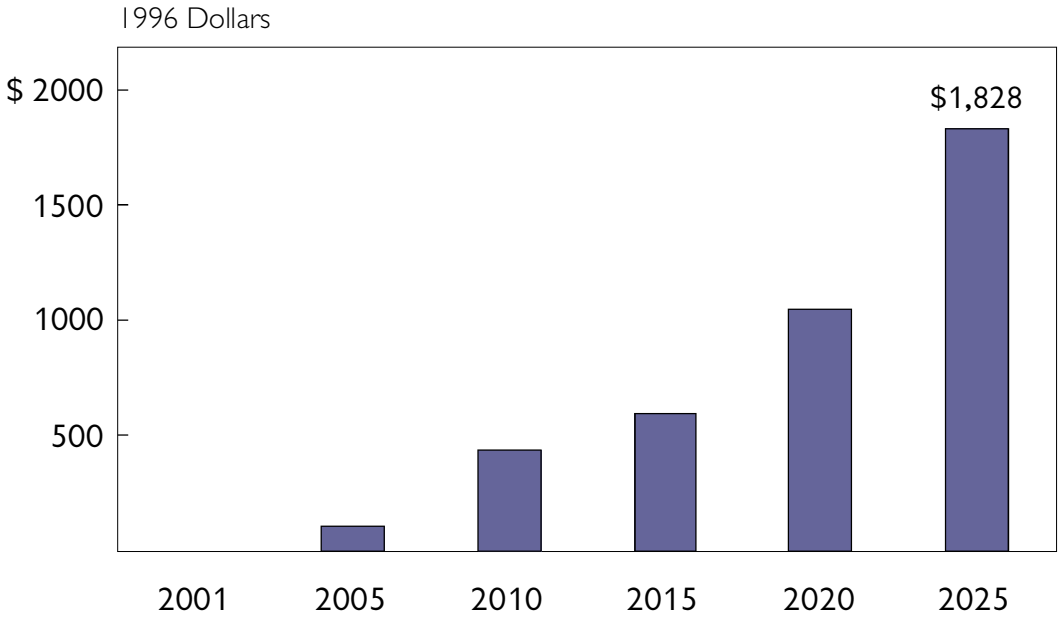


Chart 20
CDA 02-01
Investment - Nonresidential
Trillions of 1996 Dollars
5
4
3
2
1
Bush Plan
By-the-Book
4.96
4.76
2001
2005
2010
2015
2020
2025
Source: Center for Data Analysis at The Heritage Foundation.

Chart 19 CDA 02-01

Additional Income for a Family of Four Under Bush Plan



Source: Center for Data Analysis at The Heritage Foundation

Table 1 CDA 02-01

$1,828 is equivalent to the following:

45% of grocery expenses
or
70% of entertainment costs
or
73% of clothing expenses
or
97% of health care expenses
or
123% of gasoline costs

Note: According to the 1996 Bureau of Labor Statistics Consumer Price Index for average annual expenditures of a family of four.

Source: Center for Data Analysis at The Heritage Foundation

Modeling Methodology

Heritage Foundation economists in the Center for Data Analysis (CDA) followed a two-step procedure in analyzing the economic effects of President Bush's energy plan.

First, preliminary supply, demand, and price estimates for the by-the-book forecast and the Bush Plan were obtained from WEFA. These estimates are described elsewhere in this report.

Second, the supply, demand, and price changes were introduced into the long-term WEFA U.S. Macroeconomic Model. The WEFA model is a dynamic model of the U.S. economy that is designed to estimate how the general economy would be reshaped by policy reforms. Heritage economists have developed a revised WEFA model that incorporates the energy assumptions developed by WEFA's energy group.

The Simulation

The WEFA model contains a number of variables that are used to simulate proposed policy and economic changes. The following sections describe how the CDA static energy estimates were introduced into the WEFA model to estimate the dynamic economic results of the Bush Plan.

- **Domestic Supply of Oil.** The WEFA model contains a variable that measures the total amount of domestic oil supply. Heritage economists adjusted the supply upward for each of the forecast years to reflect an increase based on WEFA's estimates.

- **Domestic Demand for Oil.** The WEFA model contains a variable that measures the total amount of domestic demand for oil. Heritage economists adjusted the demand downward for each of the forecast years to reflect a decrease based on WEFA's estimates.

- **Energy Prices.** The WEFA model contains variables that measure energy price indices for electricity, natural gas, oil, and gasoline. Heritage economists adjusted the changes in these indices to reflect WEFA's estimates.

- **Investment.** The WEFA model contains a variable that measures the amount of investment in the utility and energy sectors. Heritage economists adjusted the investment for each of the forecast years to reflect WEFA's estimates.

- **Consumer Sentiment.** The WEFA model contains a variable that measures the amount of consumer sentiment. Heritage economists conservatively adjusted consumer sentiment to reflect Heritage's estimates of the small increase that would result from greater energy supplies and lower energy demand based on historic trends.

- **Oil Imports.** The WEFA model contains variables that measure energy imports. Heritage economists adjusted these variables to reflect changes based on WEFA's estimates.

- **Federal Spending and Revenue.** The WEFA model contains variables that measure federal spending and revenue. Heritage economists adjusted the federal spending and revenues based on estimates of the Bush Plan from the House Budget Committee.

- **Monetary Policy.** The model assumes that the Federal Reserve Board will react to this policy change as it has historically. This assumption was incorporated in the Heritage model simulation by including the stochastic equation of the WEFA model for monetary reserves. A small change was made to the federal funds rate to reflect the minimal changes in inflation.

How President Bush's Energy Plan Would Affect Selected Economic Indicators
(Preliminary Results)

Economic Indicators	2001	2005	2010	2015	2020	2025	(Average) 2005 - 2025
Gross Domestic Product			In Billions of 1996 Dollars				
By The Book	9,524.7	10,899.9	12,588.5	14,644.0	17,147.8	20,268.0	15,109.6
Bush Plan	9,524.7	10,910.7	12,646.7	14,745.2	17,367.6	20,807.6	15,295.6
Difference	0.0	10.8	58.2	101.2	219.8	539.6	185.9
Real GDP Growth Rate			Percent Change from Year Ago				
By The Book	2.2	2.7	3.0	3.1	3.3	3.5	3.1
Bush Plan	2.2	2.7	3.1	3.2	3.4	3.7	3.2
Difference	0.0	0.0	0.1	0.1	0.1	0.2	0.1
Total Employment			In Thousands of Jobs				
By The Book	132,180	138,902	146,553	153,739	161,395	169,886	154,095
Bush Plan	132,180	138,949	146,777	154,169	162,230	171,387	154,702
Difference	0	47	224	430	835	1,501	607
Disposable Personal Income			In Billions of 1996 Dollars				
By The Book	6,712.0	7,629.2	8,652.6	10,066.0	11,719.3	13,661.7	10,345.8
Bush Plan	6,712.0	7,636.5	8,685.1	10,112.4	11,803.8	13,814.9	10,410.5
Difference	0.0	7.3	32.5	46.4	84.5	153.2	64.8
Disposable Income Per Capita			In 1996 Dollars				
By The Book	24,248	26,687	29,066	32,455	36,311	40,780	33,060
Bush Plan	24,248	26,713	29,175	32,605	36,573	41,237	33,261
Difference Per Person	0	26	109	150	262	457	201
Difference for Family of Four	0	104	436	600	1,048	1,828	803
Investment - Nonresidential			In Billions of 1996 Dollars				
By The Book	1,459.6	1,805.9	2,224.0	2,745.7	3,482.0	4,742.4	3,000.0
Bush Plan	1,459.6	1,799.6	2,240.7	2,771.4	3,555.8	4,961.7	3,065.8
Difference	0.0	-6.3	16.7	25.7	73.8	219.3	65.8
Consumer Price Index			Percent Change from Year Ago				
By The Book	2.2	2.5	2.4	2.4	2.5	2.5	2.5
Bush Plan	2.2	2.4	2.5	2.5	2.5	2.6	2.5
Difference	0.0	-0.1	0.1	0.1	0.0	0.1	0.0
Treasury Bond, 10 Year			Annualized Percent				
By The Book	4.9	5.7	5.6	5.4	5.3	5.3	5.5
Bush Plan	4.9	5.7	5.6	5.5	5.3	5.4	5.5
Difference	0.0	0.0	0.0	0.1	0.0	0.1	0.0

4. Conclusion: The Bush Plan Works

The United States faces energy shortages in some areas because imprudent policies and conscious neglect have prevented the supply of energy from increasing to meet Americans growing demand for power. Federal policies have raised the cost of production, discouraged new production, and ignored the need to upgrade the nation's aging infrastructure. States such as California have compounded these problems with their own unwise restrictions and futile attempts to defy the laws of economics by imposing price controls. Americans are now suffering the consequences of these reckless policies: rising utility bills, rolling blackouts, and higher gasoline prices. Failure to responsibly deal with these problems threatens the nation's economic prosperity, quality of life, and national security.

President Bush has proposed a balanced long-term energy plan to correct these problems. The Bush Plan ensures that our country will have affordable, reliable and sufficient supplies of energy into the future, maintains a 21st century quality of life for U.S. citizens, and protects the nation's environment, natural resources and wildlife.

The Bush Plan, however, is not perfect. The plan proposes various federal subsidies and tax incentives that interfere with market forces. The President should strengthen the plan by omitting these counterproductive mechanisms and allow an unfettered competitive market to achieve the intended outcomes.

A chapter-by-chapter policy analysis of the Bush Energy Plan is presented below.

Chapter 1 – Taking Stock: Energy Challenges Facing the United States

Energy supply and demand are imbalanced in the United States. This imbalance threatens the nation's economy, standard of living, and national security. Because of the vital role energy plays in the everyday lives of Americans and our nation's economic prosperity, the President has made energy policy a top priority for his Administration. Accordingly, the President issued an Executive Order directing all federal agencies to recognize the importance of energy in their policies by including a detailed statement with any regulatory action that could significantly and adversely affect energy supplies, distribution, or use of energy that would explain: 1) the impact of the proposal, 2) adverse effects that cannot be avoided if the proposal is implemented, and 3) alternatives to the proposed action. This type of Executive Order is long overdue and necessary to inform decisions affecting energy policy. It will help the Bush Administration ensure that Americans have reliable, affordable, and sufficient supplies of energy into the future.

Chapter 2 – Striking Home: The Impacts of High Energy Prices on Families, Communities, and Businesses

The Bush Plan recognizes that high energy costs leave American families with less money to spend on other needs. Low-income consumers are hurt the most by rising energy costs. The President proposes to mitigate these hardships on low-income consumers by increasing federal funding of two existing programs: 1) the Low-Income Home Energy Assistance Program, better known as LIHEAP, and 2) the Weatherization Assistance Program.

Chapter 3 – Protecting America's Environment: Sustaining the Nation's Health and Environment

The Bush Plan protects the nation's environment, natural resources, and wildlife while simultaneously providing Americans with reliable, affordable, and sufficient supplies of energy for the future. To achieve these goals, the Bush Plan responsibly balances environmental and energy policies and considerations.

The Bush Plan improves air quality by promoting multi-pollutant legislation that mandates reductions in three pollutants: SO_2 (sulfur dioxide), NOx (nitrogen oxide), and mercury. The first two are already regulated under existing programs under the Clean Air Act (CAA) and the last is not. These reductions would be accomplished through a flexible, free-market program. Not only would this program improve air quality, it would also provide regulatory certainty for the power industry regarding when and at what level pollutants must be controlled. This certainty, in turn, should increase investment in new technological equipment and improvements in air quality.

In addition to enhancing air quality, the plan promotes land conservation by creating the "Royalties Conservation Fund" to earmark monies for conservation efforts and eliminate the backlog of maintenance and improvement projects on federal lands.

The Bush Plan also directs federal agencies to expedite energy-related projects in an environmentally responsible manner. To ensure that federal environment and energy policies are coordinated, the Bush Plan establishes an interagency task force chaired by the Council on Environmental Quality. These measures balance increased consumer demand for energy and the President's commitment to protect the environment.

Chapter 4 – Using Energy Wisely: Increasing Energy Conservation and Efficiency

The Bush Plan emphasizes the importance of conservation and efficiency in developing a comprehensive national energy policy. Promoting energy efficiency through technological improvements will allow consumers to use less energy while receiving the same energy services. In addition to stretching the nation's supply, the plan's emphasis on energy efficiency will reduce dependence on foreign supplies.

Of particular significance, the Bush Plan's energy efficiency programs reduce demand for electricity, reduce capacity requirements, reduce generation requirements, and reduce average line losses by about 50 percent.

Energy efficiency is also enhanced by the President's proposals to extend and expand the Energy Star program and the appliance program. Through these measures, consumers will reap the benefits of energy efficiency improvements. They will receive the same amount of energy services, for such needs as lighting, heating, and transportation while simultaneously using less energy and reducing their energy bills. Likewise, expansion of the Department of Energy's Weatherization program will reduce the heating and cooling costs for low-income households as it decreases consumption and maintains the desired level of service.

Chapter 5 – Energy For A New Century: Increasing Domestic Energy Supplies

Oil and Natural Gas – To meet the growing demand for oil and natural gas, the Bush Plan will increase domestic supplies of oil and natural gas. The Bush Administration recognizes that energy production can be significantly increased by tapping unused resources in relatively small parcels of federal lands. New technologies, such as horizontal drilling and three-dimensional seismic technology allow for sophisticated energy production that enhances environmental protection. Accordingly, the President proposes that these advanced technologies be used to enhance oil and gas recovery from existing wells, areas available on the Outer Continental Shelf (OCS), the Arctic Outer Continental Shelf, the National Petroleum Reserve-Alaska (NPR-A), and the "1002 Area" of the Arctic National Wildlife Refuge (which accounts for only 2,000 out of a total of 19 million acres that comprise ANWR), and other appropriate areas in the lower 48 states.

Electricity – It is estimated that electricity demand will increase by 45 percent by the year 2020. The United States will need about 393,000 MW of new generating capacity by 2020 to meet this growing demand. To meet this future demand and prevent electricity shortages and blackouts, the Bush Plan proposes that additional power plants be built throughout the country. Due to the energy efficiency measures in the Bush Plan, however, the number of new power plants needed to be built will be less than initially predicted. By 2010, approximately 100 fewer power plants than previously estimated will need to go on line, and by 2030, about about 364 fewer power generating units than originally projected will need to be built.

Coal – The United States has abundant coal reserves. Coal is used almost exclusively to generate electricity. Until recently, costly environmental regulations have limited or prevented the production of coal resources in some areas. Advances in clean coal technology, however, have reduced these barriers. The Bush Plan recognizes the benefits of these technological advancements and the importance of coal as a fuel source. To allow the use of coal to generate electricity without adversely affecting air quality, the Bush Plan significantly increases research funding in clean coal technologies.

Nuclear Power – Nuclear power already accounts for 20 percent of all U.S. electricity generation. Because of its strong safety record in the United States, its operating performance of about 90 percent and its advantages for air quality, the Bush Plan promotes the expansion of nuclear energy through such measures as streamlining the licensing process, extending the Price-Anderson Act, and providing a permanent repository for its waste. Extending the licenses of existing facilities will reduce the need to use fossil fuels to meet the growing demand for electricity in the United States. Likewise, capacity will be enhanced by expediting applications for licensing new advanced-technology reactors.

Hydropower – Although hydropower accounts for only about 7 percent of overall U.S. electricity generation, several western states as well as Maine and New York depend heavily on this source of energy. The Bush Plan proposes to increase capacity by optimizing efficiency and reliability at existing hydropower facilities. The Bush Plan also supports reform of the hydropower licensing process to reduce the time, cost, uncertainty, and interagency conflicts of this procedure. These measures will increase output from hydropower and reduce the need to use fossil fuels to meet the growing demand for electricity.

Chapter 6 – Nature's Power: Increasing America's Use of Renewable and Alternative Energy

Renewable and alternative energy supplies reduce the need to use fossil fuels to produce energy. While renewable and alternative energy resources currently account for only 9 percent of the nation's energy needs, their use is growing as research and technology improve and costs are reduced. The Bush Plan supports sufficient funding for research and development of these resources, promotes use of these resources through various tax incentives, and endorses access to federal lands to increase renewable energy production, such as biomass, wind, geothermal, and solar.

Chapter 7 – Energy Infrastructure: A Comprehensive Delivery System

The Bush Plan recognizes that the nation's infrastructure for energy delivery is inadequate and unreliable. Current transmission constraints limit the flow of electricity and result in higher prices for electricity. Likewise, shortfalls in natural gas pipeline capacity combined with right-of-way issues and local permitting delays have constrained the ability to transport natural gas and contributed to higher prices. Insufficient domestic pipeline capacity has also caused peak-load problems in moving oil and petroleum products such as gasoline from one region of the country to another resulting in shortages of supplies and price spikes in gasoline, heating oil, and liquefied petroleum gas. The Bush Plan will upgrade the nation's infrastructure to reduce disruptions in delivery to consumers, increase capacity, and enhance energy efficiency. Of particular significance is the increased energy efficiency that would result from these infrastructure upgrades. Energy transmission line losses would be reduced by about 50 percent.

The Bush Plan also calls for a long overdue review of the New Source Review (NSR) Program. The President directs the Environmental Protection Agency (EPA) and the Department of Energy (DOE) to review the impact that this program is having on investments in new utility and refinery generation capacity, energy efficiency, and environmental protection and to report its findings to the President by mid-August 2001. Likewise, the Department of Justice is directed to ensure that existing NSR enforcement actions are consistent with the Clean Air Act and its regulations.

Additionally, the Bush Plan directs EPA and DOE to ensure that federal policies provide for adequate refining capacity. Doing so would reduce price volatility as well as reliance on imports.

Chapter 8 – Strengthening Global Alliances: Enhancing National Energy Security and International Relationships

U.S. national energy security depends on sufficient, reliable and affordable energy supplies. Among the measures related to international energy policy, the Bush Plan enhances U.S. trade alliances, strengthens America's dialogue with major oil producers, promotes greater oil production in the Western Hemisphere, Africa, the Caspian Sea area and other regions with abundant oil supplies, ensures that emergency supply reserves obligations are met, and encourages increased energy efficiency and the use of clean coal technologies. These initiatives encourage greater diversity of oil production, reduce supply disruptions and market instability, benefit consumers, and enhance national security.

Concluding Remarks

The President has proposed a comprehensive and balanced long-term energy plan that corrects the imbalance of supply and demand, ensures that Americans have a reliable and affordable supply of energy for the future, and provides responsible stewardship of the country's natural resources. Implementing the plan would promote the use of technology to improve the environment while providing a stable supply of energy at reasonable prices without the United States becoming too dependent on foreign imports.

The Bush Plan would increase the domestic supply of energy to meet growing demand; upgrade the nation's energy infrastructure to increase efficiency and better delivery to consumers; promote new technologies to increase energy efficiency, conservation and renewable sources of energy; and protect the environment. The plan accomplishes these things without favoring one industry over another. The projected energy savings of the Bush Plan would expand the economy faster than it would under current law, increase the number of job opportunities and investment, and improve the standard of living for Americans.

The demand for energy in the United States is projected to increase by 62 percent from 1990 to 2010, yet energy supplies have not grown to meet that demand. To ensure adequate supplies of energy are available, the Bush Plan proposes to increase energy efficiency by 20 percent by 2020 and reduce total energy demand by 2.8 percent in 2030, or enough energy to run 39.7 million homes for one year. Efficiency gains come from a variety of conservation measures, such as extending and expanding the National Appliance

Conservation Act and Energy Star program. Moreover, the Bush Plan promotes more effective energy transmission and distribution to consumers by updating the nation's aging energy infrastructure. Removing pipeline constraints and transmission bottlenecks would lower energy prices and an upgraded electricity infrastructure would reduce transmission line losses by 50 percent. Reduced demand would lead to 364 fewer power generating units being needed to meet America's energy needs.

The President's energy plan improves the environment in the long run. Reducing the demand for electricity and extending the life of nuclear power plants reduces the production of hydrocarbons from the burning of fossil fuels. The Administration also takes specific steps to protect the environment by increased funding for clean coal technology and promoting research and development of renewable sources of energy. The Bush Plan would also take steps that would reduce auto emissions by reducing gasoline consumption by 21.7 million gallons in 2030, about 30 percent of gasoline consumed by passenger cars in 1998.

The Bush Plan would help meet the growing demand for energy by allowing new development on federal lands that contain substantial, untapped resources. Technological improvements in the production of oil and natural gas would reduce the impact on the environment while increasing domestic supplies of energy. These new techniques would allow the recovery of oil from ANWR while effecting just one-hundredth of a percent of the total land of ANWR. The production of oil from new sources would allow the United States to reduce its dependence on foreign oil from 65 percent in 2030 to 57 percent.

Technological advancements will also boost the production of electricity generated by coal and nuclear power, enabling these plants to last longer and generate more efficient energy. Clean coal technology will allow more coal plants to meet their environmental regulatory requirements and reduce pollutants emitted by coal plants. The Bush Plan promotes safe nuclear energy through several measures, which would allow nuclear energy to be used for a longer period of time. Increased use of nuclear energy greatly reduces the amount of air pollutants that are released by fossil fuel plants.

Under the Bush Plan greater energy efficiency and lower energy prices would improve the economy. The gross domestic product, adjusted for inflation, would increase by an average of 0.1 percent a year, or $540 billion more dollars by 2025. American businesses would hire 1.5 million new workers in this expansion, substantially reducing

unemployment. An American family of four would see a better standard of living and have $1,800 more under the Bush Plan than current law. A stronger economy would also increase investment by an average of $65 billion per year from 2002 to 2025.

The Bush Plan is balanced: its adoption would increase the likelihood that America's energy needs would be met over the next thirty years while reducing the demand for energy and protecting the environment. It also provides a solid platform for greater economic growth. In short, while preventing blackouts and other dangerous shortfalls in our energy supplies, the Bush Plan provides a strong guiding light for our economic future.

5. Glossary of Terms and Measurements

ANWR	Arctic National Wildlife Refuge
b/d	Barrels per day (measurement of oil products)
Barrel	A unit of volume equal to 42 U.S. gallons.
Btu	British thermal units (measurement of heat energy). The quantity of heat needed to raise the temperature of 1 pound of water by 1°F at or near 39.2°F.
CAAA	Clean Air Act Amendment of 1990
CAFE	Corporate Average Fuel Economy. The mileage the federal government requires each automaker to attain when the fuel economies of all the vehicles it sells in a model year are averaged.
CHP	Combined Heat and Power
cts.	Cents
Electric Power Plant	A station containing prime movers, electric generators, and auxiliary equipment for converting mechanical, chemical, and/or fission energy into electric energy.
Electricity Generation	The process of producing electric energy or transforming other forms of energy into electric energy. Also, the amount of electric energy produced or expressed in watt hours.
Energy Consumption	The use of energy as a source of heat or power or as an input in the manufacturing process. Electrical energy is usually measured in kilowatt-hours, while heat energy is usually measured in British thermal units.
Energy Source	A substance, such as oil, natural gas, or coal, that supplies heat or power. Electricity and renewable forms of energy, such as wood, waste, geothermal, wind, and solar, are considered to be energy sources.
gal.	Gallon
FERC	Federal Energy Regulatory Commission. FERC is an independent regulatory agency with jurisdiction over interstate electricity sales, wholesale electric rates, hydroelectric licensing, natural gas pricing, oil pipeline rates, and gas pipeline certification.
Fossil Fuel	Any naturally occurring organic fuel formed in the Earth's crust, such as oil, coal, and natural gas.

Fuel Ethanol	An anhydrous, denatured aliphatic alcohol intended for motor gasoline blending.
GDP	Gross Domestic Product. The total value of goods and service produced by labor and property located in the United States.
GW	Giga (billion) watt
Hydrocarbon	An organic chemical compound of hydrogen and carbon in the gaseous, liquid, or solid phase.
Hydropower	The production of electricity from the kinetic energy of falling water.
ISO	Independent System Operator
mm	Million
NEPD	National Energy Policy Development (group)
Natural Gas	A gaseous mixture of hydrocarbon compounds, primarily methane, delivered via pipeline for consumption. It is used as a fuel for electricity generation, a variety of uses in buildings, and as raw material input and fuel for industrial processes.
NO_x	Nitrogen Oxide. Compounds of nitrogen and oxygen produced by the burning of fossil fuels.
Nuclear Electric Power	Electricity generated by an electric power plant whose turbines are driven by steam generated in a reactor by heat from the fissioning of nuclear fuel.
NSR	New Source Review program
OCS	Outer Continental Shelf
OPEC	Organization of Petroleum Exporting Countries. Current members are Algeria, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, United Arab Emirates, and Venezuela.
PABE	Pollution Abatement Equipment
Pipeline, Natural Gas	A continuous pipe conduit, complete with such equipment as valves, compressor stations, communications systems, and meters, used for transporting natural gas and/or supplemental gaseous fuels from one point to another, usually from a point in or beyond the producing field or processing plant to another pipeline or to points of use. Also refers to a company operating such facilities.

Pipeline, Oil	Oil and product pipelines (including interstate, intrastate, and intracompany pipelines) used to transport oil and petroleum products, respectively, within the 50 states and the District of Columbia.
PM	Particulate Matter
Q Btu	Quadrillion British thermal units
Refinery	An installation that manufactures finished fuels from oil, unfinished oils, natural gas liquids, other hydrocarbons, and alcohol.
Renewable Energy	Energy obtained from sources that are essentially inexhaustible (unlike, for example, fossil fuels, of which there is finite supply). Renewable sources of energy include conventional hydroelectric power, wood, waste, geothermal, wind, photovoltaic, and solar thermal energy.
RTO	Regional Transmission Organization
SO_2	Sulfur Dioxide. A toxic, colorless gas, soluble in water, alcohol, and ether. Used as a chemical intermediate in paper pulping and ore refining, and as a solvent.
SCR	Selective catalytic reduction units. Pollution control equipment to reduce NOx.
SPR	Strategic Petroleum Reserve. Petroleum stocks maintained by the federal government for use during periods of major supply interruption.
tb/d	Thousand barrels per day
Tcf	Trillion cubic feet (measurement of natural gas)
TWh	Tera (trillion) watt hours
Wellhead Price	The price of oil or natural gas at the mouth of the well.
Wh	Watt hour (measurement of electricity energy)