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NATIONAL ENERGY POLICY: IN NEED OF A MORE DYNAMIC APPROACH

Executive Summary

- Recent changes in national security, as well as concerns about environmental degradation and the stability of foreign energy sources, led President Bush to establish the National Energy Policy Development Group in January 2001.
- Its report, in May 2001, focused on demand management, production and supply, and infrastructure issues in energy. The approach recommended in the report includes subsidies for research and development, administrative action through Executive Orders, and collaborative cross-agency efforts.
- While the Bush approach appears innovative and less prescriptive than traditional "command and control" energy and environment regulation, it retains too much government manipulation of markets, and does not recognize the range of institutional approaches available to address energy challenges.
- Many of the Bush proposals and methods, including its flaws, are reflected in the energy bills passed by the House and the Senate. Substantial disagreement exists between the two bills, and, if the very best features of each bill were selected, and the rest dropped, the result would be worthwhile. However, given the pervasive subsidies, government management of economic activity, and inadequate attention to market processes common to both bills, and hence most likely to survive the conference, the best possible bill may be no bill at all.
- The Bush national energy policy addresses energy demand management by focusing on increasing energy efficiency and conservation. The recommended approaches, including expanded EnergyStar certification, efficiency standards for appliances, and revised CAFE standards, are neither innovative nor market-oriented. Instead they rely on setting static, fixed, arbitrary targets and using political processes to determine them.
- The proposals also ignore both the information content of prices, and the related ability of prices to discipline consumption and to lead to efficient conservation.
- The recommendations for supply and production focus on domestic drilling and exploration, particularly on federal land. Contrary to the recommended increased leasing on federal lands, sale of these lands to private owners would go a long way toward encouraging economically efficient investment, exploration, and drilling.

- The other predominant approach to supply and production is technology subsidies, particularly for renewable energy technologies. The continuing research subsidies to get technologies to the point where they are commercially viable overlooks an important point: the fact that these technologies are not commercially viable may mean that they are not economically efficient. If entrepreneurs and investors do not think that these forward-looking investments make economic sense, then for the government to override this decision with subsidies is almost certain to be wasteful, and smacks of economic paternalism and central planning.
- The Bush national energy policy also addresses energy infrastructure needs, particularly electricity transmission. Recommendations include collaboration between the Department of Energy and the Federal Energy Regulatory Commission to increase transmission reliability, analysis of transmission bottlenecks and their causes, building the incentives for efficient transmission investment into FERC-regulated rates, and the use of federal eminent domain to reduce the cost of building long-distance transmission.
- Many of the electricity transmission recommendations are sensible, and a good first step, but they do not reduce the artificial barriers to entry that keep transmission investment from facing a market test. Without these barriers, transmission would be contestable, with potential competitors free to enter the market if they could find a more efficient way of providing transmission services.
- Competitive transmission would not lead to wasteful duplication of investment in infrastructure, but would create optimal redundancy that would improve the security and reliability of the transmission system.

NATIONAL ENERGY POLICY: IN NEED OF A MORE DYNAMIC APPROACH

Interest in energy issues and policies has been increasing in the past several years. Sustained economic growth in the 1990s led to increased consumption of electricity and fossil fuels, but both real and fabricated concerns about environmental degradation from energy use accompanied those increases.¹ At the same time, regulatory changes in some energy industries (especially natural gas and electricity) unleashed some dramatic changes in how those industries operate and are structured. Motivated by national security concerns and the reliability of foreign energy sources in the late 1990s, President Bush established the National Energy Policy Development Group in January 2001.

After consultation with industry and environmental organizations, the National Energy Policy Development Group issued its report² (hereafter referred to as the Bush national energy policy) in May 2001. The federal energy policy focuses its attention in three areas:

- ▶ Demand management;
- ▶ Production and supply issues; and
- ▶ Infrastructure development.

Within each of these the Bush national energy policy takes three approaches: subsidies to create incentives for reduced energy consumption and more energy industry investments (particularly for research and development); administrative action through "executive orders" to change energy related regulations and direct federal agency policies; and collaborative efforts among agencies with other groups to determine additional steps. The Bush national energy policy contains as many recommendations for continued effort, investigation, and collaboration as it does concrete energy policy actions. Where the policy does get specific, it does not generally recommend the use of traditional tax instruments to discourage energy use, but instead relies on carrots to encourage choices deemed beneficial.

While the Bush approach appears innovative and less prescriptive than traditional "command and

control" energy and environment regulation, as articulated in the proposal it is still based on a poor understanding of economic activity. It retains too much of the government manipulation of markets, particularly in picking the technology winners that will receive research subsidies. It does not recognize the importance of institutional context or the range of institutional approaches available to address energy challenges. For example, there is little discussion of relying on prices to shape demand in energy markets, and the major institutional changes needed to make electricity markets more competitive are addressed summarily.

A more dynamic approach to energy policy would focus on the removal of regulatory and institutional disincentives to competition and entrepreneurial discovery of opportunities and focus government policy on the margins, possibly to aid the transition to competitive markets. This approach needs to be developed as an alternative national energy policy, and to point the way, in this paper we briefly highlight these possibilities for demand management and production issues, and then explore them in greater detail in electricity transmission infrastructure.

Many of the Bush proposals and methods, including some of its flaws, have been incorporated in energy bills passed by the House and the Senate, along with other objectionable provisions of Congressional devising. These include a plethora of tax credits and subsidies for specifically identified conservation measures and production techniques that are not otherwise economical. Many of these go beyond Bush proposals for merely publicizing energy efficient products and supporting research. The greatest pro-market step in the Bush and House plans, opening a tiny sliver of the Arctic National Wildlife Refuge (ANWR) to oil exploration, is deliberately excluded from the Senate bill. This and other significant differences between these bills must be reconciled in a House-Senate conference if there is to be an energy bill enacted by this Congress. Failure to reach agreement in this session will leave the issues to be addressed anew by the next

Congress. Given the inadequate attention to market forces and the distorting subsidies that are rife in both bills, it would be best if no agreement is forthcoming.

I. Demand Management and the Price System

There are two ways to set the demand for energy. One is to allow the free market to work through the price system, as it does for most goods and services. The other is to influence demand by means of government intervention via taxes and regulation.

Household and business users of energy adjust their demands for energy in response to market price signals. Energy suppliers, at least those outside of cartel arrangements, adjust their output in response to market signals as well. These market price signals and resulting demand and supply adjustments are the chief means of achieving efficiency in energy use and production. They bring supply and demand into balance, encouraging people to use energy wisely, that is, when the value of its use exceeds its costs.

By contrast, changes in energy demand driven by policy interventions are inherently divorced from the real economics of energy production, produce unpredictable reactions from consumers and producers, and raise a host of complex issues depending on whether the industry is electricity, natural gas, or petroleum.

Concern over energy demand is frequently the door through which politics enters the energy market. At least since the oil shocks of the 1970's, reducing demand for energy has been a subject of policy.³ Indeed, a host of political issues have led people to advocate government action to curb or manage energy demand. These include:

- ▶ Environmental concerns over emissions, fuel resource recovery, and the impact of economic growth facilitated by increased energy use;⁴
- ▶ Political concerns over an energy market in which substantial supplies are imported and hence "dependent" on foreign sources;⁵ and
- ▶ Social concerns over access to energy markets based on arguments that electricity, heating oil,

etc. are necessities and should not be subject to market price fluctuations.

Demand management policies generally take the form of conservation measures employing taxes, subsidies, or regulations designed to reduce the consumption of energy.⁶

Although critics have claimed that the Bush national energy policy does not have a role for conservation,⁷ the policy in fact devotes a full chapter to conservation measures. These consist mainly of efforts to improve energy efficiency (the amount of energy output obtained from a given amount of fuel).⁸ The national energy proposal's conservation recommendations mainly rely on increasing Department of Energy programs to encourage energy efficient facilities, improving consumer information on the energy efficiency of the appliances and machines that they use, and improving fuel efficiency in transportation.

The Bush national energy policy recommends that the federal government promote energy efficiency and conservation through executive directives, subsidies, and collaborative cross-agency activity. Recommended executive directives, especially to the Department of Energy, include:

- ▶ Expanding the EnergyStar efficiency labelling program beyond office buildings and (mostly new) homes to additional types of structures, including schools, retail buildings, health care facilities, and additional homes, and to more products, appliances and services;⁹
- ▶ Taking "steps to improve the energy efficiency of appliances"¹⁰;
- ▶ Setting higher energy efficiency standards for appliances "where technologically feasible and economically justified"¹¹;
- ▶ Having the Treasury Department change the tax treatment of combined heat and power technologies, and directing the Environmental Protection Agency (EPA) to facilitate combined heat and power siting at brownfield sites "consistent with the local communities' interests"¹²;
- ▶ Revising Corporate Average Fuel Economy (CAFE) standards to promote energy

efficiency, taking into account safety concerns and looking for market-based approaches to increase fuel efficiency;

- ▶ Exploring tax credits for fuel-efficient vehicles; and
- ▶ Developing and implementing a strategy at the EPA to educate consumers about the benefits and savings from energy efficiency.

These recommendations are largely exploratory, but they do include some subsidies (tax credits for fuel-efficient vehicles), cross-agency collaboration, and some traditional command-and-control approaches (e.g., CAFE standards).

This approach to demand management is not innovative or market-oriented. It would have the government set fixed targets and goals that it has arbitrarily determined through some political decision process, instead of letting market forces select appropriate targets for efficiency by comparing costs and benefits, which may well shift over time as energy prices move and technology improves. Thus, it relies on conventional, static political approaches to complex, dynamic problems.

A. Let Prices Do Their Job

The Bush national energy policy report rightly acknowledges that the degree of energy efficiency in the economy is mainly the result of the interactions of a large number of dispersed consumers, each with different preferences, incentives and incomes. Unfortunately, the report tends to overlook the often adverse influence that government policies can have on energy efficiency and energy consumption. In particular, it ignores the perverse incentives that are often created by misguided attempts to directly control consumer energy demand.

One key area of confusion is the failure to understand that increased energy efficiency does not necessarily lead to decreased energy consumption. The primary product that the consumer cares about is not the energy itself, but what can be accomplished with the energy. Energy use is the means not the end.

The debate over CAFE standards provides the quintessential example. These standards dictate to

automobile producers average fuel efficiency standards for their fleet of cars. The problem is that drivers are consuming miles of travel, not gasoline *per se*. Increased fuel efficiency makes driving a given number of miles cheaper, which, everything else equal, leads to an increase in miles driven. This creates the possibility that increased fuel efficiency could lead to increased gasoline consumption overall. In fact, several studies have suggested that because of this effect CAFE standards are ineffective in reducing gasoline usage.¹³ So far President Bush has opposed increases in CAFE standards, but, as noted his national energy policy does not rule them out and there has been no suggestion that he opposes standards that are currently in place.

Assuming that the purpose of "demand management" is to make sure that energy demand is consistent with current and future supplies, the Bush policy neglects what nearly all economists would agree is the most effective tool, the unregulated market price system. Prices carry information through the economy. They encapsulate data about raw material costs, supply, demand, labor, culture, markets, and other tradeoffs that are so complex that even today's computers cannot begin to unravel them. In simplest form, prices help tell consumers when it makes sense to consume more or less of a good, while telling suppliers when to invest more or less in production.

Prices carry accurate information when they are set by the unfettered interaction of supply and demand. The same information cannot successfully be reproduced by analysis and calculation in a rate-setting or price-controlling process. Governmental attempts to set or manipulate prices, either through direct controls, regulations, or taxes, at best can create a rough and inflexible approximation of a market-clearing price. There would be none of the market feedback from the ongoing transactions between suppliers and purchasers that would normally adjust and fine-tune the price to bring demand and supply into balance, and no automatic adjustments to keep them in balance over time. Price controls and price distorting regulations have a millennium-long history of disrupting markets. Price ceilings and regulatory curbs have led to shortages and misallocation of supply, inadequate investment, wasteful consumption, and myriad other problems.

Price floors and subsidies have led to gluts and misallocation of resources. These consistent lessons from the past are ignored at our economic peril.

B. Prices and Conservation

The natural workings of the price system encourage an efficient degree of energy conservation. The politics of energy use interfere with that outcome. Regulation in energy industries, particularly with respect to retail prices of electricity, natural gas and oil, have dulled consumer awareness of the actual resource scarcities and opportunity costs of energy in incremental or marginal alternative uses. This is because these highly regulated markets are not reflecting actual conditions of supply and demand, either in terms of total quantity used or in the timing of consumption with respect to peak and off peak hours.

As a resource becomes more scarce, prices will go up and consumption will be reduced. In an open market with flexible prices, people's demands will always adjust to both current and expected future resource availability. One thing we learned from the California electricity crisis is that consumers do respond in a rational and considered way to changes in energy prices, even in the short run. For example, when San Diego's electric rates more than doubled in the summer of 2000, demand fell by an average of 1.6 percent, and by 6 percent during peak periods.¹⁴

In spite of this evidence, we have seen a profusion of news articles, media reports, and opinion pieces over the last year emphasizing the need to conserve energy, but very rarely pointing out that customers who see their prices go up have the best incentive to conserve. Indeed, policy prescriptions aimed at conservation tend to emphasize subsidies to get consumers to conserve, as seen in the Bush administration's proposal for tax credits to subsidize fuel-efficient automobiles. The idea that market prices alone would more effectively and efficiently motivate consumers to purchase energy-efficient appliances and systems has not yet been integrated into energy policy. But the fact is that the only way of knowing whether further conservation is even necessary is to allow prices to freely reflect market conditions. In a free market, people will automatically adjust their usage to accommodate

changing conditions of scarcity in ways that are consistent with their individual needs and the values that they place on the use of the energy. This is the true definition of energy efficiency.

The electricity market is the sole remaining component of the energy industry with retail rate caps, but regulation of the industry has been moving slowly toward allowing price flexibility and what is known as "real-time pricing." Real-time pricing harnesses the dramatic improvements in information technology of the past decade and gives consumers a tool for managing their energy use. Right now, almost all consumers pay prices that reflect the average cost of electricity rather than prices that reflect the cost of the units they are actually using at the time — what is called the marginal cost. These marginal costs, which a true market price would reflect, would more accurately convey the nature of market scarcities in the here and now. With average cost pricing, industrial, household, and commercial consumers have little incentive to manage their consumption and use less electricity during peak hours when demand is exceptionally high and utilities are having to bring their most expensive generating units on line or to buy additional power from the grid at peak rates.

Real-time pricing's most enticing long-run benefit is its encouragement of an efficient level of conservation. Producing electricity during hours of particularly high demand — for example, between 9:00AM and 5:00PM on a hot summer day — is often more expensive because back-up generators and less efficient facilities need to be put in use. If consumers can get cheaper rates at other times, they have an incentive to shift some of their energy consumption to those non-peak hours. Price signals are the most effective way to encourage conservation and to allow people to make informed choices about how and when they will use electricity. Economic incentives to conserve could limit or prevent blackouts, especially since conservation is needed the most at times of peak demand. Real-time pricing also can help achieve environmental goals. By shifting use away from peak hours it decreases the need for backup generators and older, dirtier power plants that only come into use "at the margin," during periods of high demand.

Real-time pricing is already in place in several areas of the country, including Georgia and Washington. Georgia has seen peak summer demand fall by 5 percent since Georgia Power implemented real-time pricing for only 1,650 large users. New York is also considering implementing a real-time pricing pilot program.

All of this evidence shows how prices suffice to manage demand even in the tricky case of electricity. Prices work even better in more competitive energy markets such as petroleum and natural gas.¹⁵

II. Production and Supply

The Bush national energy policy emphasizes two ways of increasing energy supplies — increased exploration and drilling for fossil fuels, and increased subsidies for research and development of such technologies as safer nuclear reactors and renewable resources. While the President's approach to the former makes sense, i.e., increased usage of public lands for exploration and drilling, environmentalists have made it a political hot potato. On the other hand, the President's approach to research, with its focus on government subsidies, is misguided and follows an old-style central planning model.

A. Drilling and Exploration

As the Senate energy debate and the vote against drilling in ANWR illustrates, the issue of drilling for more domestic sources in areas like Alaska is highly contentious and political. In addition, differing costs of production in the U.S. and elsewhere complicate the environmental and national security picture. Persian Gulf producers continue to be the lowest cost oil producers, so increased domestic production would be likely to take place at higher cost than foreign production. If OPEC were to increase its output and reduce the world price of oil below the cost of producing more oil domestically, the added domestic output would be cut off, and we would not reduce our dependence of foreign oil. But then, we would have no economic reason to do so. Meanwhile, as long as world oil prices remain high enough to make additional domestic oil production profitable, it makes economic sense to develop that domestic capacity. Either the threat or actuality of additional domestic production would provide

competitive pressure on world oil prices, and put pressure on the OPEC cartel to keep prices below levels that would draw even more competing oil into the market.

One major political objective is to ensure a stable and predictable energy supply. Again markets, combined with reliable domestic supplies of oil and gas, will help serve this objective. An efficient market system will incorporate information on changes in costs and risks into prices. Both current and especially futures prices provide the means for managing information and expectations to decrease price volatility.

Futures markets incorporate expected future conditions of supply and demand and therefore help to allocate energy resources efficiently through time. They help buyers and sellers manage risk in potentially volatile markets, like oil and gas, by creating the ability to buy and sell today the rights to a commodity in the future. Consumers (individual and business) benefit from these instruments through stable energy prices and the resulting predictability and ability to plan their own energy budgets. Market participants acting on their expectations convey information about market conditions. Expectations of future prices are incorporated into current production and consumption decisions, reducing volatility and contributing to more stable and certain markets for energy and for other goods and services. Development of additional domestic supplies will help reduce the risks associated with political shocks to the price mechanism and will increase the chances that expectations of future supplies that are built into today's prices will be accurate.

Many of the drilling-related recommendations in the Bush national energy policy focus on encouraging the Department of the Interior to streamline regulatory procedures governing oil and natural gas drilling on federal land.¹⁶ In addition to terrestrial drilling issues, the recommendations include considering reducing royalty rates for offshore drilling on federal tracts, and further public-private partnerships to improve oil and gas exploration. None of the recommendations allude to the root of the issue — federal "ownership" and management of such huge tracts of land containing such valuable resources. Sale of these lands to private owners

would go a long way toward encouraging economically efficient investment, exploration, and drilling.

B. Subsidizing Technology

Much of the emphasis of the Bush national energy policy is on technological change, particularly on innovations that will encourage the use of renewable resources to produce energy. The proposal highlights the benefits of technological change in improving the quality of life of individuals throughout history, and how technological change has enabled us to conduct increasing amounts of economic activity with our scarce resources. Unfortunately, the President's policy report invokes a "central planning" model in this area and ignores the benefits of allowing technology to develop in response to consumer and producer rather than political interests.

The primary policy proposal is to increase subsidies for research and development. The economic rationale is that such "blue sky" research is often not viable in commercial settings, so subsidies are needed to reduce the cost of exploratory research and get technologies to the point where they are commercially viable. This argument glosses over a key point: the fact that these technologies are not commercially viable may mean that they are not economically efficient. If entrepreneurs and investors in the market do not think that these investments make economic sense, then for the government to override this decision with subsidies is nothing more than paternalism and central planning.

The energy policy recommends subsidizing research for a wide array of fuels — coal, nuclear, wind, solar, hydrogen, and fusion, to name a few. Coal subsidies would encourage the development of "clean coal" technologies that remove impurities from the coal before use. Much of that research is already sponsored by the Department of Energy and performed at, or in conjunction with, national labs.

A similar story holds for nuclear technologies, many of which have been advanced or developed through Department of Energy research. Federal funding of nuclear research has decreased in the past two decades. Lately, it has focused on technologies

for storing and handling waste, and for making spent plutonium useless for military purposes or terrorism, such as making "dirty bombs".

The largest focus of research and development subsidies in the Bush national energy policy is on renewable resources. The Bush national energy policy encourages development of renewable power on federal land, as well as increased general budget support for the Department of Energy for renewable energy research. The policy also suggests extending and expanding existing tax credits for landfill methane projects, producing electricity with wind or biomass, and developing legislation to create a federal tax credit for residential solar power. Ethanol receives continued subsidies in this proposal, through extension of its federal excise tax exemption.¹⁷

Subsidizing renewables is not likely to yield long term benefits. Solar, wind, geothermal, and biomass energy remain at about 2 percent of energy consumed in the United States, a share which is unlikely to grow significantly until their costs come down. (Indeed, wind energy technology is making some strides in that direction.) If these technologies truly made economic sense, including covering the cost of the research to lower their cost to competitive levels, they would not need government subsidies. Studies have shown that various schemes to expand the share of energy produced by renewables cost far more than the value of the environmental benefits achieved and actually create new environmental problems of their own.¹⁸

The Bush national energy policy does bring one reality check to its recommendations on renewables. President Bush has a "management agenda" that is designed to improve the management of federal agencies by adopting performance-based criteria for decision making and action. Under this initiative, performance is ultimately tied to budget appropriations.¹⁹ Based on this agenda, the administration's FY2003 budget proposal evaluated the effectiveness of many programs and recommended cutting or eliminating funding to those that were deemed ineffective.²⁰ The energy policy applies this principle as well:

The NEPD Group recommends that the President direct the Secretary of Energy to

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

Even if the administration were to follow through on eliminating demonstrably ineffective renewables programs, the remaining subsidization of other renewables would still be questionable policy. Specifically, why does the national energy policy subsidize any renewables, or any other form of energy such as "clean coal", at all?

The history of research and development subsidies shows that it is hard to find subsidy programs that have led to worthwhile research that would not have been conducted anyway.²¹ Government funding often simply replaces private funding, a phenomenon known as crowding out.

Another problem is that in order to subsidize research and development effectively, one must know what one wants to see discovered. Government policies that determine what is needed in advance, often called "picking winners", does not have a track record of success.²² Why would it? Government decision makers have no incentive to choose projects that will actually lead to the production of goods and services desired by consumers. They face none of the constraints imposed by the system of profit and loss. Consequently, federal agencies struggle to measure the performance of their programs and to define what constitutes "successful" research and development. For example, Department of Commerce attempts to define performance standards for *government* research do not relate them to outcomes that matter to the taxpayers, but rather simply measure the amount of research done.²³ The research becomes an end in itself, and is a "success" whether or not it provides actual benefits. If government agencies have trouble measuring the success of their own research efforts, one can hardly expect them to be successful at subsidizing private research and development.

This "central planning" approach to technology does not lead to a good outcome. Economically efficient technological change should be driven by consumer demand and opportunity-seeking entrepreneurs, not by subsidies that simply reduce research costs at the margin for politically favored research activities. Such subsidies and incentive programs are counterproductive because they induce some opportunity-seeking entrepreneurs to use their skills to meet the pre-defined goals of subsidy programs rather than seeking the unprogrammed but truer innovations that more closely serve the needs of market participants.²⁴ Programs like those proposed in the Bush national energy policy divert entrepreneurial activity away from socially beneficial discovery and innovation and create a class of researchers and businesses that become beneficiaries of redistribution policies. These programs are about corporate and academic welfare and not efficient energy policy.

III. Competition and Infrastructure in Electricity

The most pressing energy infrastructure needs are in electricity. The Bush national energy policy recognizes that improvements in the transmission grid are important for continued economic growth and prosperity. The existing long-distance transmission infrastructure is insufficient to support the dramatic increases in the trade of generated electricity since the deregulation of the industry in the early 1990s. In particular, policymakers are focusing on the deficiencies of a transmission grid built for contiguous, local, vertically integrated monopolies, not for dynamic competitive markets across time and place.

Remedies fall into two categories — build more transmission capacity, or reduce the demand for transmission services. The Federal Energy Regulatory Commission (FERC) and Congress are each implementing changes that will increase transmission capacity and reduce transmission demand, and the Bush national energy policy supports these moves. FERC also is promoting institutional change by ordering the formation of "regional transmission organizations" (RTOs), through which transmission owners will build and manage the grid over larger areas than before.

The Bush national energy policy recommends the following policy changes regarding electricity infrastructure:

- ▶ Collaboration between the Department of Energy and FERC to increase transmission reliability;
- ▶ Increasing Department of Energy research on transmission reliability and new technologies, such as superconductors;
- ▶ Analyzing existing transmission bottlenecks and their causes, with the objective of constructing a national grid network;
- ▶ Encouraging transmission investment, and having FERC build those incentives into their regulated rates; and
- ▶ Using federal eminent domain to obtain rights of way for building transmission, as is the case in natural gas pipeline construction.

A. Creating a Competitive Market in Electricity

The President's Energy Policy Report urges the Secretary of Energy to work with FERC to identify and relieve transmission constraints, and to encourage the use of incentive rate-making proposals favorable to transmission infrastructure. This is a sensible first step, but more change is needed.

FERC's RTOs initiative seeks to encourage "efficient" investment in transmission infrastructure. By establishing RTO rules, FERC can move the industry toward building and managing a national grid network. But such a move establishes a government run "ordered competition," which is not the same thing as a true competitive market. While "ordered competition" through the RTO structure could be intended as a first step in moving the industry toward a competitive market structure, it is at best only part of the legislative and regulatory changes needed to unleash competition in the industry. For competition to flourish, policy must focus on removing barriers to entry and technological change in order to allow for competition in providing the transmission. The "one size fits all" prescriptive approach to RTO implementation that emerged during 2001 does not reduce the artificial barriers to entry that keeps transmission from facing a market test. These artificial barriers include:

- ▶ State-level monopoly franchises;
- ▶ Restrictions on applying/implementing new technologies;
- ▶ Unrealistically low rate of return allowances on investment;
- ▶ Environmental regulations; and
- ▶ Lack of cross-agency coordination at both federal and state levels.

Investing in new transmission lines is risky, time consuming, and expensive. With state monopoly franchises, there is little incentive to make long-run strategic investments in transmission lines, especially when the regulators permit a greater rate of return on investing in new generating plants than they allow on transmission investments. Add to that the bureaucratic nightmare of building transmission lines across jurisdictions, and even worse the lengthy and expensive process of reviewing environmental impacts, and it is little wonder transmission is under-capitalized. Further complicating the situation, some states (e.g., Texas) deliberately seek to block the transmission connections needed to become fully integrated with the national power grid to keep "domestic" power from being exported to other states to avoid exposure to national electricity prices.

Without these barriers, the transmission market would be what some economists call *contestable*. This means that potential competitors would be free to enter the market if they could find a more efficient way of providing transmission services. The best way to achieve the real benefits and dynamic efficiency of a competitive market would be to reduce artificial barriers to entry and see the extent to which transmission really can be provided by competitors.

Regulation of the electricity industry is moving away from its traditional "command and control" approach toward more use of choice and markets. It does, though, retain the government-granted monopoly franchise in transmission and distribution. This overlooks the possibility of competition in those segments of the industry, and stifles potentially beneficial technical and institutional innovation. Transmission policy decisions at the federal level continue to be influenced by the "natural monopoly" model. This theory was developed in the early part of the 20th century as a justification for the regulation

of electricity and other so-called "public utilities." It argues that if electricity markets were left unregulated they would not support competition, due to significant economies of scale in generation and cost savings achieved by avoiding duplicative delivery systems, and ultimately a single monopoly provider would dominate. It concludes, therefore, that the government itself should grant monopoly status to electricity providers and then regulate their rates "in the public interest." The problem with the theory of natural monopoly is that it never matched reality. When monopoly electric utilities were first created by the government, free markets were not degenerating into monopoly but were highly competitive. Furthermore, modern technology in the provision of electricity has made competition even more feasible.

FERC's efforts at institutional and regulatory change to promote competitive electricity markets is a welcome departure from the historical forms of utility regulation that are based on this antiquated model. But the model has not been completely rejected. The retention of the premise that natural monopoly conditions characterize transmission, and that such conditions imply the need for ongoing economic regulation, limits the institutional reform and may have some unintended costs. Mandating a particular institutional structure, especially one based on natural monopoly theory, will forestall the discovery of possibly superior alternatives that would develop if markets were open.

B. Would Competition Be Wasteful?

"Natural monopoly theory" purports to justify monopoly franchises in part as a way of avoiding supposedly "wasteful" duplication of facilities. Yet Primeaux's study of cities that have two or more electric utilities competing head-to-head for customers over parallel systems found that competing utilities do not underutilize capacity or have higher rates, as natural monopoly theory (and regulators) would suggest.²⁵ In fact, it is the regulations themselves that have caused inefficiencies. Research has shown that the capital intensiveness of the electricity industry increased promptly after monopoly regulation was imposed early in the 20th century.²⁶ By the 1990s regulatory regimes that tied

utility rates and profits to capital investment had created considerable wasteful capital investment.

The idea that redundant electricity transmission would be unnecessarily costly continues to permeate public policy regarding transmission, including FERC's recent decisions regarding RTOs. This view fails to consider alternatives to the existing model of large-scale centralized power generation transmitted over a long distance transmission grid. One promising alternative is "distributed generation". Distributed generation is the use of small-scale electric power generation close to where the power is needed. Technological change in the past two decades has made distributed generation more economical than the older, central generation plants that contributed to the large economies of scale typically associated with the electricity. Furthermore, current policy seems not to recognize the security benefits derived from having more than one system.

Removing disincentives to grid ownership consolidation and removing barriers to entry for grid competitors go hand in hand. Removing barriers to entry would mitigate concerns over market power that might arise with increased consolidation of grid ownership by unleashing economical alternatives to the grid that would impose discipline on grid pricing. An institutional structure that removes barriers to entry would also be more flexible than traditional regulatory institutions.

RTOs may be part of "getting the rules right" for increasing competition in the electricity industry, but the benefits will be limited as long as RTOs are based on the natural monopoly model of transmission. Regulatory changes that will create more benefits involve:

- ▶ Removing artificial barriers to entry facing transmission competitors;
- ▶ Enabling transmission ownership consolidation, including participation of for-profit transmission companies, with RTOs serving to ensure electricity network system reliability; and
- ▶ To the extent that there is regulation, taking an integrated approach across the segments of the industry, recognizing the dynamics of

technological changes and their interdependent consequences.

This approach to electricity transmission is the type of approach that should be applied to all sectors of the energy market. The Bush national energy policy would be more effective in creating efficient energy markets if it combined its collaborative efforts and administrative and regulatory changes with fundamental institutional changes that foster competition, and dropped its use of subsidy policies that often do not work and are wasteful. This advice applies to all three areas that the policy addresses — demand, production, and infrastructure. In each area, getting the institutions — the rules of the road for the market and the factors that influence choices — to be dynamic and flexible in the face of inevitable change, and getting them to foster competition, would put us on the right road to long term energy efficiency and sustainability.

Over the past decade, various countries have moved toward deregulation and privatization of the electricity industry with various degrees of success. No country or state has moved to complete deregulation. All have retained some vestiges of control over pricing, service, or entry decisions for some or all parts of the electricity supply chain. These vestiges of control and the desire to manage competition undermine precisely the highest value benefits associated with deregulation. Federal policy should avoid these errors. In particular, steps to open the transmission sector of the industry to real competition and contestability should be part of federal electricity policy in order to enable market participants to capture those yet-unrealized benefits.

Conclusion

While moving away from the use of traditional tax instruments to discourage bad behavior, the Bush

national energy policy proposal still relies on static notions of "getting the right outcome" and using subsidies to encourage good behavior. Instead, a more dynamic set of policies that concentrates more on removing regulatory and institutional disincentives to "good" behavior would encourage more entrepreneurial activity to optimize energy production, use, and technological change.

The Bush national energy policy, and the various versions of legislation accompanying it, is unduly prescriptive; it dictates means and ends for governing consumer energy demand and encouraging energy supply. The interests of energy consumers across the board and of innovative energy producers would be better served by policies that rely on market forces to determine demand and supply. Such policies should eliminate existing regulatory barriers that hide the cost of energy from consumers and block competition in electricity generation and transmission. Federal energy policy toward production and supply should also avoid the pitfalls of "picking the winners" through subsidies of research to use specific inputs to achieve specific outcomes, and should instead emphasize performance measures that reward entrepreneurial achievement of both anticipated and unexpected results.

The Administration should strip its energy policies down to market-oriented essentials in order to send a clear signal to the Congress as to what constitutes good policy. Then it should fight to make the Congress listen and legislate accordingly.

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Endnotes

1. Energy Information Administration, *Annual Energy Outlook 2002* (Washington, D.C.: U.S. Department of Energy, December 2001), available at www.eia.doe.gov/oiaf/aeo/contents.html). Note also that energy consumption per dollar of GDP has fallen steadily since 1973.
2. National Energy Policy Development Group, *National Energy Policy* (Washington, D.C.: U.S. Government Printing Office, May 2001). Available at www.whitehouse.gov/energy.

3. Terrence R. Fehner and Jack M. Holl, *The United States Department Of Energy, 1977-1994: A Summary History* (Oakridge, TN: Office of Scientific and Technical Information), available at www.osti.gov/html/doe/about/history/doehist.html.
4. The Energy Information Administration provides a fairly comprehensive overview of the potential environmental impacts of energy use at www.eia.doe.gov/env/new.html.
5. A good overview of this issue and analysis of realistic policies to cope is provided by William L. Anderson, "Uncle Sam's Energy Mess: How the U.S. Government Empowers the OPEC Cartel and Takes Power from the People," Institute for Research on the Economics of Taxation, Washington, D.C., *Studies in Social Cost, Regulation and the Environment*, No. 5, March 2001, at ftp.iret.org/pub/SCRE-5.PDF.
6. See U.S Code Title 42, Chapter 77 "Energy Conservation," available at www4.law.cornell.edu/uscode/42/ch77.html.
7. David Sanger and Joseph Kahn, "The Energy Plan: The Overview; Bush, Pushing Energy Plan, Offers Scores Of Proposals To Find New Power Sources," *New York Times*, May 18th 2001, p. A1, and for example, see the National Wildlife Federation comments (www.nwf.org/bushadministration/).
8. See Chapter 4 "Using Energy Wisely: Increasing Energy Conservation and Efficiency" in the *National Energy Policy*.
9. The EPA's Energy Star program sponsors labeling of energy-efficient office buildings and (mostly newly built) homes, and some products, appliances, and services. It provides benchmarking and targeting guidelines to enable businesses to earn Energy Star labels to use in their marketing. See www.epa.gov/nrgystar/about.html.
10. *National Energy Policy*, pp. 4-5.
11. *National Energy Policy*, pp. 4-6.
12. *National Energy Policy*, pp. 4-9. Combined heat and power is a process of generating electricity that captures waste heat and uses it as a heat source. This is more a supply issue than a demand management issue, but does qualify as "conservation" for the report. A brownfield site is a building or piece of land that has already been developed.
13. See Roy Cordato, "Corporate Average Fuel Economy Standards: The Case for Repeal," IRET, Washington, D.C., *Studies in Social Cost, Regulation and the Environment*, No. 3, May 2000, at ftp.iret.org/pub/SCRE-3.PDF.
14. See James Bushnell and Erin Mansur, "The Impact of Retail Rate Deregulation on Electricity Consumption in San Diego," POWER Working Paper 082, April 2001, at www.ucei.berkeley.edu/ucei/PDF/pwp082.pdf
15. Anderson, "Uncle Sam's Energy Mess," pp. 5-6.
16. *National Energy Policy*, pp. 5-20.
17. For an extensive discussion of these kinds of subsidies see Jerry Taylor and Peter VanDoren, "Evaluating the Case for Renewable Energy: Is Government Support Warranted?," Washington DC: CATO Institute Policy Analysis, No. 422, January 2002.
18. *Ibid.*
19. Office of Management and Budget, "President's Management Agenda," August 2001, www.whitehouse.gov/omb/budgetfy2002/mgmt.pdf
20. Office of Management and Budget, *Budget of the United States Government: Fiscal Year 2003*, www.whitehouse.gov/omb/budget/index.html.
21. Scott J. Wallsten, "The Problem with Picking Winners: Evaluating Government Support for Commercial R & D," Stanford Institute for Economic Policy Research Policy Brief, March 2001, available at siepr.stanford.edu/papers/briefs/policybrief_mar01.pdf
22. Linda Cohen, and Roger Noll, *The Technology Pork Barrel*, (Washington, D.C.:The Brookings Institution, 1991); and Robert Margolis and Daniel Kammon, "Underinvestment: The Energy Technology And R&D Policy Challenge," *Science*, vol. 285, 1999, pp. 690-692.
23. National Institute of Standards and Technology, "R&D Performance Measures for Government Research," www.nist.gov/director/planning/r&d_perf_meas.pdf.
24. Israel M. Kirzner, *Discovery and the Capitalist Process* (Chicago: University of Chicago Press, 1985), p.144ff.
25. Walter J. Primeaux, Jr., *Direct Electric Utility Competition: The Natural Monopoly Myth* (New York: Praeger, 1986).
26. Thomas Lyon, "Capture or Contract? The Early Years of Electric Utility Regulation," paper presented at 2001 American Economic Association meetings.

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