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*This article provides an analysis from a European perspective of the influence of environmental objectives on American energy policy. It describes how environmental legislation, such as the Clean Air Act, NEPA and the Surface Mining Act, constrains growth in the energy sector by way of cost increases in energy production and use and interference with the pursuit of energy security (e.g., through constraints on coal extraction and use, nuclear development and off-shore exploration). At present, despite the Bush Administration's restrained position on the greenhouse effect, environmental objectives appear to have a high priority in the setting of energy policy. Thus, even before the current Gulf crisis, there was a growing interest in energy conservation as a policy objective.*

*L'article analyse, d'un point de vue européen, l'influence des objectifs environnementaux sur la politique énergétique américaine. Il montre comment les lois environnementales passées et récentes (Clean Air Act, NEPA, Surface Mining Act) contraignent l'évolution du secteur énergétique (extraction et mise en oeuvre du charbon, développement du nucléaire, exploration des zones off-shore). A l'heure actuelle, malgré la modération de l'Administration Bush vis-à-vis de l'effet de serre, les objectifs environnementaux paraissent devenir des critères de premier rang de la politique énergétique, alors qu'auparavant ils faisaient plutôt figure de contraintes. Ceci se traduit concrètement par un intérêt croissant porté à la conservation d'énergie avant même la crise du Golfe.*

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## Environmental Protection: A Priority for American Energy Policy

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From a European perspective (and particularly in France, where protection of the environment has only recently become a major public policy objective), the US government appears to have adopted a significantly tougher stand on the environment since 1988.

President Bush stated his views clearly and forcefully when he presented his landmark air quality bill on June 12, 1989 (*Energy Economist*, 1989a, p.2):

The wounded winds of north, south, east and west can be purified and made clean, and the integrity of nature can be made whole again. Ours is a rare opportunity to reverse the errors of this generation in the service of the next. And we cannot, we must not fail. We must prevail.

The commitment expressed here appears to go beyond mere rhetoric and is having a significant impact on the US approach to energy issues. Protection of the environment is now placed on an equal footing with energy security, least cost, and regional equity on the list of energy policy criteria. "We can no longer postpone reconciling the energy requirements necessary for the standard of living Americans expect, and our desire for a safe and healthy environment," Energy Secretary James Watkins stated in December 1989. "The National Energy Strategy will be built on this fundamental premise" (*Petroleum Economist*, 1989b).

This position may seem new. But if we set aside the current attention given to world climate change by politicians and the media, the present stance can be considered a continuation of a policy trend initiated in 1970. The legislative and regulatory framework established at that time was quite strict and it has had a significant impact on the costs and development of the US energy industry, even during the period of economic crisis and the policy of deliberate inaction that marked the Reagan years.

The current legislative response to the resurgence of environmental awareness echoes the response of lawmakers to the emergence of the environmental movement in the early 1970s. Similarly, the political repercussions of the Exxon Valdez disaster in March 1989 show some remarkable parallels with the blowout of the Union Oil drilling platform off the Santa Barbara coast in January 1969. Both of these incidents sparked new environmental legislation that weakened the position of industry.

What distinguishes the current initiatives is that environmental protection now appears to be a top priority of energy policy in the complex interplay of interest groups, whereas previously it was viewed primarily as a constraint on development. As a result, energy choices are now even more conflict-ridden than before, given the difficulty of reconciling such divergent interests. The situation is further complicated by the Bush Administration's continuing commitment to limiting the tax burden and to protecting the interests of US industry. That explains the current position of the Administration in regard to strengthening the Clean Air Act relative their position on the original bill. The Bush Administration has also sought to ensure that international efforts to combat the greenhouse effect do not adversely affect the US economy over the next decade, particularly in the form of a tax on carbon emissions. Nevertheless, although the Administration's initiatives have been criticized as too weak by environmentalists, and even by foreign governments, they are nonetheless real measures with significant consequences for the US energy sector.

## 1. A Strict Legislative Framework

The US energy sector has operated under severe environmental constraints for two decades. In response to pressure from the environmental movement, a series of far-reaching legislative measures was enacted beginning in the late 1960s (Ringleb, 1986).

### *The Original Clean Air Act*

The first piece of legislation concerned with protecting air quality was the Air Quality Act, passed in 1967. As a concession to the energy industry, it imposed no emission standards, leaving it up to individual states to set their own standards according to local conditions and federal scientific guidelines. While the legislation was flexible, it referred only to health criteria, excluding such considerations as cost and technological feasibility. The same approach characterized the Clean Air Act, enacted in 1970 over the opposition of the energy industry. This new act, which was amended in 1974 and 1977, prescribed specific federal emission standards for a number of pollutants: particulates, SO<sub>2</sub>, ozone, hydrocarbons, CO, NO<sub>x</sub> and lead. It severely limited the options open to the energy industry and to major energy consumers.

In order to achieve the required emission levels in polluted cities, many coal-fired electric power plants were forced to switch to low-sulphur western coal or to install costly scrubbers. New plants were required to install the latest pollution control equipment, although these technologies were not fully perfected. Coal sales, meanwhile, were strongly affected by environmental regulations that encourage the use of natural gas and lower-sulphur fuels in industry and electric power generation, particularly on the US east coast. However, the impact of these measures was partially offset by the high prices of these fuels and by the Fuel Use Act of 1978, which was intended to discourage such uses of hydrocarbons for reasons of energy security.

Another aspect of the Clean Air Act was the tough restrictions it imposed on motor vehicle emissions. This led, in the 1970s, to the introduc-

tion of catalytic converters and to modifications in engine design. According to US auto-makers, the end result was an efficiency loss of 15%.

In addition, the regulations designed to prevent "strong deterioration" in relatively unpolluted regions, implemented under the Act in 1974, made it difficult to start up new energy industries in such areas, including mine-mouth coal-fired electric plants and tar-sand and synthetic fuel projects.

#### *The National Environmental Policy Act*

Another legislative milestone was the National Environmental Policy Act, which came into force in January 1970. It required government agencies to conduct environmental impact studies of all public and private projects that might affect the environment. For environmentalists, this clause proved an effective way to stall or even bring to a halt several energy projects. It further fragmented the approval process by allowing opponents to institute legal action and by forcing the government agencies involved to specifically consider alternatives to their plans. Pipeline construction, the building of new nuclear and conventional thermal plants, and the sale of offshore concessions were all adversely affected by this act.

#### *Other Regulations*

The Surface Mining Act, which regulated open-pit mining operations, was passed with some difficulty in 1977.<sup>1</sup> It, too, restricted the use of coal as an alternative to foreign oil. It is true that environmentalists did not get everything they wanted from the Act, since they had sought an outright ban on this type of operation in large parts of the country. Nevertheless, the Act did impose a stringent authorization procedure on the energy industries, and it required them not to contribute to water pollution and to restore sites to their original conditions once operations had ceased. For the coal industry this solution proved a costly compromise. The Act's onerous requirements spelled the end for a number of new factories and synthetic fuel projects.

During the 1970s, the complex authorization process for new nuclear reactors, stringent regulations and the unpredictability of regulatory changes made it increasingly difficult to plan projects and virtually impossible to control capital costs. In the end, faced with mounting financial risks, electric utilities became disenchanted with further investment in nuclear power. The fact that all orders placed after 1972 were eventually cancelled is eloquent proof.

#### *Impact of the Legislation*

This body of regulations and legislation had a definite positive impact on health protection. Emissions of SO<sub>2</sub> by coal-fired plants, for example, fell by about 10% between 1980 and 1987, even though consumption increased by 23% over the same period (National Coal, 1988). But another consequence was a noticeable change in the competitive environment within and among the energy industries. Development of coal and electricity production was particularly affected.<sup>2</sup> According to estimates by the Electrical Power Research Institute (EPRI), the regulations were responsible for about 40% of the increase in the average cost of electricity generation, which rose from 4 cents/kWh in 1970 to 6.2 cents/kWh by 1984 (1984 US dollars) (Peck, 1989).

Another effect of these regulations was to close off certain energy policy options, such as nuclear energy and synthetic fuels. Efforts to reduce dependency on foreign energy and oil were undermined as a result. However, the legislation did serve to reinforce the legitimacy of the energy conservation policies introduced between 1973 and 1981. This convergence of policy was sometimes indirect, when the critical lack of investment in electricity generation, due in large measure to environmental regulation, ultimately

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1/ The full title of the Act is the Surface Mining Control and Reclamation Act of 1977.

2/ Note that there are legislative measures in other areas, not discussed here, that have also imposed strong restrictions on the energy industries, notably the Clean Water Act, which was passed in 1972 and toughened in 1977.

forced public utilities to develop ways to sell electricity conservation services.

During the Reagan years, a time when the Administration listened carefully to the views of industry on environmental issues, there was a push for "smaller government." The actions of the Environmental Protection Agency (EPA), set up in 1970 to implement environmental legislation, came under severe criticism. Glaring examples of mismanagement in certain programs, such as the federal "superfund" for cleaning up industrial waste dump sites, provided ample ammunition for free-market forces. The EPA was reorganized and became much less aggressive. Despite constant lobbying from environmentalists and their congressional allies, no new environmental legislation was passed. An initial attempt to reform the Clean Air Act in 1987 came to naught. Inconclusive scientific evidence was cited, as decisions on new problems (acid rain) were expressly put off in order to save public money.

Nevertheless, even after 1980, the regulatory and legislative apparatus remained restrictive. The Reagan Administration did not succeed in easing environmental regulations as it originally intended to do, particularly in order to help coal producers. Nor was it able, in the course of its eight-year mandate, to simplify nuclear regulation to any real extent. In the offshore oil industry, environmental groups succeeded in hobbling the policy of auctioning permits, the centerpiece of the Reagan Administration's oil policy. The original target was to open two-thirds of the continental shelf to exploration between 1982 and 1987, but by 1988 only 20% had been opened up.

During this period, the Congress acted as a counterweight to the Administration. It was quicker to react to the re-emergence of environmental awareness during President Reagan's second term. The Office of Technology Assessment (OTA), an arm of the Congress, persistently criticized the EPA. In 1987, the EPA came under withering fire from the OTA for its inaction on the acid rain issue (Regens, 1988). No fewer than 15 bills on the subject were tabled by various members of Congress between 1987 and 1989

(Energy, 1989b, p.6). When the ambitious synthetic fuel project that began in 1980 was halted in 1985, the Congress put aside \$400 million that it earmarked for the development of clean uses of coal. The Clean Coal Project expanded quickly. From the nine projects on various technologies originally sponsored, the program was expanded in 1987 and 1990 with two waves of 13 new projects. Since 1985, some \$2.3 billion has been spent.

## **2. Tightening the Restrictions: the New Clean Air Act**

The reawakening of the environmental movement since 1986 has forced politicians to adapt. The trend began in 1985, with growing public awareness of, first, urban ozone concentration, and then international and global problems: acid rain, the hole in the ozone layer and, more recently, global warming. Specific problems such as forest destruction and two successive summer droughts helped trigger this resurgence, even though the issues had been identified in the 1970s. The example of European countries (Germany, Scandinavia) and pressure from Canada likely contributed to this growing awareness. Based on these concerns the media turned ecology into one of the major issues of the 1988 presidential campaign. Candidates were obliged to portray themselves as "friends" of the environment.

The initiatives taken by the Bush Administration in this area since January 1989 have contrasted sharply with its reluctance to intervene on energy issues. In July 1989, it sent Congress a bill aimed at reinforcing the Clean Air Act of 1970, many of the specific targets of which had not been achieved. Because both Congress and the executive branch are eager to see progress on environmental protection, this bill, which passed the Senate in April 1990, is expected to clear the House of Representatives by fall, after the usual back-room compromises. The main obstacles to its passage — the reservations of the business community and the diversity of circumstances and regional interests — have been overcome by consensus and a strong mobilization of

public opinion on the issue. In addition, industry representatives no longer automatically oppose measures of this kind, hoping that the new bill will partially defuse the polarization of public opinion on the environment and the greenhouse effect.

Consensus was only achieved after a long and difficult struggle. The electric industry, coal producers in the US Midwest, the oil industry, automobile manufacturers and the chemical industry all did their best to minimize the future effects of the legislation in their particular spheres of interest. Despite lobbying from environmentalists and their political allies (such as Senator Wirth and Representatives H. Waxman and C. Schneider, who were calling for very restrictive measures), the Bush Administration succeeded in securing the passage of relatively flexible regulations more acceptable to industry representatives. These measures were largely inspired by the work of economists inclined towards free-market solutions.

#### *The Provisions of the New Clean Air Act*

The basic thrust of the legislation is to rely on market mechanisms to let industries in a given area decide, in the most efficient way, the maximum amount of pollution allowable in that area on the basis of overall pollution limits, thereby minimizing the cost to the community of reducing pollution.<sup>3</sup>

This approach, which contrasts sharply with the blanket regulatory approach, in effect defines an "atmospheric bubble" above a given urban area. The overall levels of each type of emission are frozen at 1985-1987 levels. In return, each firm receives a "right" to emit effluents according to its current share of pollution. If a new firm wants to start up or an existing firm wants to exceed its share in order to expand, it must purchase the additional rights it needs from firms that have already succeeded in reducing their pollution emissions.

It is hoped that this system will prove more effective than restrictive regulations in fostering the development of new pollution control techniques. It also allows pollution reduction

through across-the-board cuts in general emission authorizations by area. Another possibility is the encouragement of shifts of industrial activity to relatively unpolluted areas when the local "bubbles" are aggregated at the national level. Thus it makes possible a steady, gradual reduction in overall pollution levels.

The new Clear Air Act addresses three main problems, two of which — acid rain and urban air pollution — concern energy. It covers emissions of toxic substances by the chemical and petrochemical industries. It proposes reducing emissions by coupling the mechanism described above with conventional regulatory measures (Berkman, 1989, pp.17-18; *Energy Economist*, 1989a, pp.2-4; *Energy Economist*, 1989b, pp.7-12). The Bush Administration has refused to institute a uniform tax system based on emission levels, arguing that it offers little incentive below a certain threshold and is economically counterproductive above this threshold. Such a system was proposed in several acid rain bills tabled in 1989; the proceeds from the tax (e.g. 0.5 mills per kWh for SO<sub>2</sub>) would have been used to subsidize investment in emission reductions.<sup>4</sup> For similar reasons, the Administration declined another possible course of action: requiring that all plants, even the least polluting, be equipped with identical environmental protection features (for example, scrubbers in electric power plants).

#### *Acid Rain Reduction*

The stated target is to reduce SO<sub>2</sub> emissions from 20 million tonnes in 1980 to 10 million tonnes by the year 2000, with 90% of this reduction to be achieved by electric utilities and 10% by other major fossil-fuel consumers. Similarly, nitrogen oxide emissions are to be reduced by 2 million

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3/ See Macaulay and Yandle (1977). The Bush Administration proposals were strongly influenced by Harvard University's 1988 project called "Harnessing Market Forces to Protect Our Environment," which studied the application of free-market principles to the task of minimizing the environmental impact of energy policy.

4/ In 1989 electric power utilities were prepared to accept such a tax. See *Energy* (1989a), p.18.

tonnes by the year 2000. In the first phase of these reductions, by 1995 plants with installed capacity above 100 MW must not emit more than 2.5 lbs of SO<sub>2</sub> per million BTUs consumed (40 kg per tonne of oil equivalent (toe)), applying this rate to average consumption from 1985 to 1987. Emission rights will be transferable among plants belonging to a single firm and among firms operating in the same state. In the second phase, beginning in 2000, rights for all plants rated at more than 75 MW will be sharply reduced to a limit of 1.2 lb/million BTUs (19.2 kg/toe). Plants whose emissions are below this level will be allowed to increase their output accordingly.

To facilitate pollution reduction in the most heavily affected areas, electric utilities wishing to build plants in less-polluted areas will have to purchase pollution permits from firms closing plants or reducing their output elsewhere. In addition, firms that retrofit their plants with clean-coal technologies will be allowed to increase their output and will be granted an extension to the 2000 deadline.

The Act will have a direct impact on the use of high-sulphur Appalachian coal. According to the electric power industry, the legislation will cost them \$5.5 billion a year in additional expenditures, which will lead to rate increases varying widely by state: 10.8-17.3% in six states, 5% and more in about 15 others. According to a study by Data Resources Inc. (DRI), 217 of the existing 800 coal-fired plants would be converted to clean-coal technologies, 133 would be equipped with scrubbers and 450 would switch to lower-sulphur western coal.<sup>5</sup> Electric utilities have complained that firms with cleaner units would be penalized along with the others. They argue that the deadlines should be made more flexible in order to make allowances for the specific circumstances of each firm and to make it easier to choose among the various clean-coal technologies, which now are only at the demonstration stage. They have also decided not to sell their emission rights, so as to leave themselves future manoeuvring room. It should also be noted that potential entrants to the electric power industry will be granted some emission rights.

### *Urban Pollution Reduction*

The target is to cut emissions across the board in order to reduce ozone concentrations. Ozone pollution is known to present significant health hazards (respiratory disease, immune deficiencies). It is caused by a chemical reaction involving a number of pollutants, most of them stemming from the use of fossil fuels (NO<sub>x</sub>, volatile organic compounds produced by the combustion of motor fuels, evaporation from hydrocarbon storage tanks) (EPA, 1987). The Act distinguishes two types of zones and sets new regulatory ceilings for each type of emission in each type of zone. It specifies three different deadlines (1995, 2000 and 2010), depending on the severity of the pollution situation in the zone in question. The legislation is aimed primarily at motor vehicles, which are the major source of organic compound emissions.

As a concession to automobile manufacturers, the Act does not impose radical reductions in the average unit gasoline consumption of new vehicles. It calls only for a reduction from the present 9 l/100 km (26 miles per US gallon) to 8.5 l/100 km (27.5 miles per US gallon) by 1997. Still, reducing gasoline consumption in order to control urban pollution represents an environmental objective that dovetails with concerns about global warming and energy security. It should be noted, however, that the Act specifies a 22% reduction in hydrocarbon emissions and a 60% reduction in NO<sub>x</sub> emissions for 40% of new vehicles by 1993. The percentage of vehicles covered will rise to 100% by 1995.

The centrepiece of the Act as far as urban pollution is concerned is the "Clean Fuel Program," designed to encourage the development of motors powered by methanol, ethanol, natural gas and propane, and of technologies for producing these two alcohol fuels. The Act stipulates that, in the nine most heavily polluted urban centres, a mandatory proportion of new vehicles will have to operate on one of these fuels, on "reformulated" gasoline or on electric-

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5/ Study by DRI/McGraw-Hill Electricity Service, cited in *Petroleum Economist* (1989a), p.257.

ity.<sup>6</sup> These cities will be able to circumvent this requirement only if they can achieve the same reductions by other means. It will be compulsory for non-electric urban mass transit systems to convert gradually to these fuels. Overall, the Clean Fuel Program should result in the annual production of 500,000 "clean" vehicles by 1995 and 1 million by 1997 (10% of annual sales). Fifteen years from now, there should be 10 million "clean-fuel" vehicles on the road.<sup>7</sup> California, which already has its own emission control program, is encouraged to continue along the same lines.

The program has been endorsed by the natural gas industry, which sees in it new market opportunities, both for supplying vehicle fuel and for providing raw materials for methanol producers. The oil industry argued successfully against an overly rigid program for introducing methanol-powered vehicles, pointing out the higher cost of these motors and the high price tag of setting up a distribution network for the fuel. It also questioned the predicted environmental benefits from the use of methanol compared with improved versions of standard motor fuels (reformulated gasoline) (*Energy*, 1989a). In addition, the automobile industry argued that the new motors could not be developed within the specified deadlines and that customers would be reluctant to purchase the new vehicles.

In any event, the current high level of public concern about environmental issues is prompting a tightening of an already quite restrictive body of legislation. This will have a major impact on US energy supply. There seems little doubt that energy and energy use will become more costly, given the need to develop new technologies, to modify some plants, to retire other plants and build new ones to replace them, and to develop and distribute new products. Estimates of the burden of the new Clean Air Act run from \$19 billion to \$30 billion a year between now and the year 2000, and part of this cost will be borne directly or indirectly by the energy industry and its customers.

However, this environmental legislation will not affect all energy industries to the same extent. It will certainly limit the market for coal and

will prompt a further shift towards the use of low-sulphur western US coal. It will also encourage the use of both domestic and imported natural gas by electric power plants and for transportation, although electric utilities plan to equip their coal-fired stations with scrubbers as a first step (*Petroleum Intelligence Weekly* (1990), p.4). Through its effect on prices, the new legislation may also promote renewed energy conservation.

### 3. The Ongoing Battle Over Criteria

Apart from the Clean Air Act, which reinforces existing constraints on energy policy, the resurgence of public environmental awareness in the political process has moved environmental issues to the head of the list of priorities. This new priority inevitably comes into conflict with the criteria that have shaped energy policy in the past (availability, national security, least cost) in the interplay of special interests. This clash of priorities has, for instance, affected the opening of offshore zones to oil exploration and the question of limiting CO<sub>2</sub> emissions.

#### *Security of Oil Supply Relegated to Second Place*

Events have not worked in favour of the Bush Administration. In the aftermath of five successive oil spills (including, of course, the Exxon Valdez disaster in Alaska on March 24, 1989 — an ecological catastrophe of unprecedented proportions), public opinion has forced the administration to compromise its efforts to stem the decline in US oil production in the medium term. President Bush had to accept Congress's decision to suspend the sale of offshore exploration permits and to shelve indefinitely plans to open the Arctic National Wildlife Refuge in Alaska to

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6/ The following urban centres are involved: Los Angeles, Houston, New York, Milwaukee, Baltimore, Philadelphia, Greater Connecticut, San Diego and Chicago.

7/ The number of cars in service in 1987 included 114 million passenger cars, 28 million small trucks, 600,000 buses and 12 million trucks. Only 30,000 vehicles were powered by natural gas. Source: IEPE data base, derived from US Department of Transportation (1989).

oil prospecting.<sup>8</sup>

The Bush Administration has been forced to watch helplessly as the public backlash over these accidents, which were caused by the shipment of oil by sea, has curtailed offshore drilling operations, with the result that more oil will have to be imported and more oil tankers will have to ply the seas.<sup>9</sup> It is difficult to predict when and under what conditions these moratoriums will be lifted. However, it is possible to estimate the oil production foregone as long as the present deadlock continues: at least 2 million barrels/day over the 2000-2005 period, including 0.8 million from the California continental shelf and 1.2 million from Alaska.

The end result of this debate is that preservation of the environment has taken precedence over energy security without the politicians and the American public necessarily appreciating the true implications of this choice. Will this attitude survive the eventual recovery of the international oil market? There is little doubt that environmental concerns will lose some of their appeal in a tight oil market; one need only look for proof to the 1970s, when nuclear power and offshore exploration were subjects of some controversy.

The answer of conservationists is that a major energy conservation campaign would reconcile these two imperatives. A drop in automobile unit consumption standards from 9 l/100 km to 7.3 l/100 km would have the same effect as developing the oilfields mentioned above.<sup>10</sup> Given the conflicts of interest and wasteful energy habits that have become ingrained over previous decades, is it really likely that the complex US decision-making process is capable of this level of policy coherence?

#### *Fighting the Greenhouse Effect: Should It Take Precedence?*

The conflict over objectives may prove to be particularly acute in the case of the greenhouse effect. International awareness of this issue emerged mainly in the United States in late 1987.<sup>11</sup> The Reagan Administration took an active part in international political and scientific

discussions on this issue, notably at the June 1988 Toronto Conference. On this occasion, 300 internationally known political and scientific figures called on the industrialized nations to reduce their CO<sub>2</sub> emissions by 20% by the year 2005, followed by a further 50% reduction to head off any further deterioration in the world climate. The US is considered to be responsible for 28 to 30% of current emissions.

Since 1988, the EPA, the US Department of Energy (DOE) and the State Department have been studying possible US responses on this issue. Some major reports have already been released (EPA, 1988 and 1989), and proposals are slated to be presented to Congress in 1991. One proposal may be for a sliding tax on gasoline and other fuels based on their carbon content. To be effective and to encourage substitution, this tax would have to be substantial, with the result that costs will rise significantly. In a recent study, the International Energy Agency showed that a sliding tax system set at \$50/t for coal, \$8/t for oil and \$1/Mbtu for natural gas would limit increases in CO<sub>2</sub> emissions to 13% instead of the anticipated 25% between now and 2025 (IEA, 1990).

However, the Bush Administration has shown little enthusiasm for a fiscal approach, concerned that fighting CO<sub>2</sub> emissions in this way would prove too costly for the US economy, since fuel prices could rise by 50 to 100%. This reluctance explains why, despite the mobilization of public

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8/ This suspension became effective when Congress decided not to approve funds requested by the Department of the Interior for financing the process of selling exploration permits at auction.

9/ According to W. Henson Moore (1990), "This is neither sound energy policy nor sound environmental policy since less offshore production will actually increase US oil imports, tanker traffic, and hence the risk of more spills and the very environmental damage people seek to prevent."

10/ See (Finon and Perrin, 1990), the first paper in this issue of *ESR*, p.79 above..

11/ The process began in 1987 with the Global Climate Protection Act of 1987.

opinion, none of the bills on this issue proposed by federal legislators has yet been examined by Congress.<sup>12</sup>

In international discussions, such as the Washington conference of April 1990, the position of the US government has lagged behind certain European countries. Alleging scientific uncertainty about whether the world's climate is really changing, the US has proposed a program of observation and climate modelling, called "Mission for Planet Earth," that would be extremely expensive — \$50 billion over 25 years.

The only policy proposed by the Bush Administration is based on the principle of "no regret." As long as formal proof of global warming is lacking, there is no reason to adopt the extravagantly expensive measures advocated by some observers in the US and abroad. On the other hand, policies that respond to other objectives, as well as reducing CO<sub>2</sub> emissions, can be applied more broadly. Essentially, this means giving a new impetus to energy conservation and renewable energy development efforts.

Accordingly, even before the National Energy Strategy had been completely formulated, a series of measures with a price tag of \$330 million was undertaken in the spring of 1990 on issues that would be priorities under the new policy. These measures were defended by Deputy Energy Secretary W. Henson Moore (*Petroleum Economist*, 1990) as follows:

Abundant testimony at our public hearings on the Strategy has documented the substantial potential of efficiency and renewables in our nation's future energy mix. Using energy more efficiently under these initiatives will also avoid damage to the environment by an estimated 800 Mt of carbon dioxide, 2.3 Mt of sulphur oxides and 2.1 Mt of nitrogen oxides annually.

The Bush Administration's go-slow approach to the greenhouse effect has thus had the paradoxical effect of aligning measures inspired by environmental concerns with energy policy objectives and criteria. It is doubtful, however, whether this will lead to any solution other than rationalizing energy consumption. It seems unlikely that electric utilities will undertake new investments in nuclear power as long as the reg-

ulatory process remains uncertain and no agreement is forthcoming on a nuclear waste storage site.

One thing is clear from this historical retrospective: protection of the environment has indeed emerged from the interplay of conflicting social and political interests as a primary objective of US energy policy. It appears to have prevailed over the criteria of energy security and least-cost availability. The goal of environmental protection has significantly hampered the expansion of domestic production capacity and contributed to higher prices. Its legitimacy as a social objective has finally made the US public ready to accept the need to use energy more efficiently. The time when energy producers and auto-makers could easily play upon the complacency of the American consumer about energy issues, a legacy from the era of abundance, now appears to be over. The imperative of environmental concern appears to be reshaping the pattern of interests and values and bringing about a reconciliation of old and new energy policy criteria under the banner of energy conservation.

However, the process of change is far from over. For example, the public does not yet seem prepared to accept an additional tax of 50 cents/gallon or more on gasoline. Similarly, the actions of the Bush Administration, which often appear rather timid and overly deferential to special interests, have come under severe criticism. From the European perspective, however, environmental protection appears to have become a major factor in US energy policy decisions, as it is in the countries that are most advanced on this score.

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12/ Refer, in particular, to the bill tabled in July 1988 by Senator Wirth following the Toronto conference. Its aim was to cut CO<sub>2</sub> emissions by 20% by the year 2000 through the promotion of renewable energy, energy conservation in the residential and service sectors, the expanded use of natural gas for electricity generation, and transportation pooling. See *Strategic Planning and Energy Management* (1988), pp.27-30. The bill tabled by representative Claudine Schneider in 1989, moreover, called for a system of taxes or rebates on automobiles based on their fuel consumption.

## References

- Berkman, M. (1989) 'Environmental regulation,' *Energy*, Summer.
- Energy* (1989a) 'New legislation pushes alternate fuelled vehicles into the forefront,' Summer.
- Energy* (1989b), Fall.
- Energy Economist* (1989a), 94, August.
- Energy Economist* (1989b), 95, September.
- Environmental Protection Agency (1987) 'The challenge of ozone production,' *EPA Journal*, 13:8, October.
- Environmental Protection Agency (1988) '*The Potential Effects of Global Climate Change on the United States*', Draft Report to Congress, October.
- Environmental Protection Agency (1989) '*Policy Options for Stabilizing Global Climate*' Draft Report to Congress, February.
- Finon, D. and F. Perrin (1990) 'US Energy Policy in the Face of Growing Oil Dependence,' *Energy Studies Review* 2:2.
- International Energy Agency (1990) '*Energy and Environment Policy Overview*' (Paris: OECD), February.
- Macaulay, M. and B. Yandle (1977) *Environmental Use and the Market* (Lexington: Lexington Books).
- Moore, W.H. (1990) 'Energy Policy of Bush Administration,' *Energy Policy*, 18:1, January-February.
- National Coal Association (1988) 'Reduction in sulphur oxide emissions at coal-fired electric utilities,' *Press Release*, July.
- Office of Technology Assessment (1989) *Catching Our Breath: Next Steps for Reducing Urban Ozone* (Washington: OTA), July.
- Peck, S.C. and J. Weyant (1989) 'The electric utilities: environmental concerns and institutional change,' *Energy Markets in the 1990s and Beyond*, Proceedings of the 11th Conference of the IAEE, p.292.
- Petroleum Economist* (1989a) August, 56:8:257.
- Petroleum Economist* (1989b) September, 56:9:279.
- Petroleum Economist* (1990) March, 57:3.
- Petroleum Intelligence Weekly* (1990) 'Coal benefits most from new US green law,' 29:20, May 14.
- Regens, J.L. and R.W. Rycroft (1988) *The Acid Rain Controversy* (Pittsburgh: University of Pittsburgh Press).
- Ringleb, A.H. (1986) 'Environmental regulation of electric utilities' in J.C. Moorehouse (ed.), *Electric Power: Deregulation and the Public Interest* (San Francisco: Pacific Research Institute for Public Policy), pp. 183-218.
- Strategic Planning and Energy Management* (1988), Fall, pp. 27-30.
- US Department of Transportation (1989) *National Transportation Statistics*, Annual Report, August.