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DE FACTO LIMITS TO GROWTH: FEDERAL ENVIRONMENTAL POLICY
AND DOMESTIC ENERGY DEVELOPMENT IN THE UNITED STATES

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Abstract

This paper argues that public environmental policy, since 1969, has imposed de facto limits on the growth of America's economy. A plethora of regulations, in response to widespread public resistance to industrial growth, has already circumscribed energy developments to the point of inertia. These national policies reflect changed public values, the implications of which should be acknowledged and evaluated by corporate and governmental energy planners and by the energy consumer as well.

1. INTRODUCTION

The formulation of any national energy policy must acknowledge "limits to growth" as more than merely a subject of academic debate. For nearly seven years, public values and public policy have clearly evinced a downgrading of economic growth as the number one priority of industrial capitalism. While there have always been individuals who resisted the encroachments of industrial growth on environmental quality, rarely did that resistance penetrate the lofty realm of federal policy. But since 1969, federal environmental policies, reflecting that resistance, have already gone beyond simply regulating resource utilization to impose de facto limits on energy development in the United States.

The great growth debate coalesced in 1972 with the publication of LIMITS TO GROWTH, a book sponsored by the Club of Rome. Based on an

M.I.T. computer simulation, this study predicted that "if the present growth trends...continue unchanged, the limits to growth on this planet will be reached sometime within the next one hundred years." But the authors also found that "it is possible to alter these growth trends and to establish a condition of ecological and economic stability." (1) Scholars from various disciplines, such as E.F. Schumacher, Herman Daly, and Paul Ehrlich, joined the fray in support of economic equilibrium. Others, like Herman Kahn, the controversial director of Hudson Institute, characterized these viewpoints as "dangerous" and "Neo-Malthusian," the products of educated "incapacity." (2) But the intellectuals debating limits, as well as the corporate leaders clinging to growth-or-else dictums, have already been bypassed by historical change.

America's 1970 environmental revolution was

marked symbolically by the January 1 enactment of the National Environmental Policy Act (NEPA) and the April 22 Earth Day celebration. In perspective, both events reflected a departure from this nation's expansionist tradition. Earth Day rallied hundreds of thousands of citizens protesting material growth which detracted from qualitative betterment. A May 1970 Gallup poll bore witness to this shift in public values which elevated air and water pollution control to a higher priority than such traditional economic concerns as employment and improved education. (3) The Congress mirrored these new public values by establishing in NEPA a national policy balancing "productivity" with an "enjoyable harmony between man and his environment." (4) Since 1970, a plethora of federal laws and regulations have explicitly subordinated growth values to health, welfare, and even aesthetic objectives. Moreover, those same mandates have implicitly limited growth by redirecting finite economic resources (labor, capital, materials) towards non-growth ends.

2. THE POLICIES THAT LIMIT

Enforcement of the National Environmental Policy Act was the first evidence of these limits. NEPA's now famous section 102(c) requires that any federal action affecting the environment must be justified by an environmental impact statement detailing the environmental costs of the action and any conceivable alternatives. Completion of the Alaska Pipeline was delayed several years by the preparation of an impact statement, by costly changes mandated by the statement's findings, and by lengthy litigation challenging the adequacy of the statement. (5) In NRDC v. Morton, the courts sustained conservationist criticisms of Interior Department rules for leasing offshore oil and gas. (6) As a result of the Calvert Cliffs' decision, the Atomic Energy Commission revamped

its nuclear power plant licensing rules, forcing substantial delays and cost increases on nuclear plant construction. (7) A lower court NEPA ruling, in Sierra Club v. Morton, required a comprehensive multistate impact statement as a prerequisite to new coal strip mining in the West. Frustrated by this demand, Exxon and Shell Oil suspended contracts to build two huge coal surface mines in November, 1975. While that decision was recently overturned, those two mines remain unbuilt. In six years, dozens of NEPA court rulings in the constraint of growth must certainly be something more than fluky victories by bright young environmental lawyers.

The annual controversy surrounding federal coal surface mining controls is a second indication of public and congressional willingness to limit energy development. Since 1970, hundreds of citizen, environmentalist, and farmer groups have adamantly sought to circumscribe or even abolish coal surface mining. Each year, CASM, the Coalition Against Strip Mining, has reaffirmed its goal of abolishing surface mining. This coalition consists of twenty national and regional conservation groups, nineteen church organizations, and it is supported by nearly 300 more local citizen groups. (8) In 1974, 88 congressmen co-sponsored Representative Ken Hechler's bill to abolish coal surface mining altogether. (9) The Senate in 1973, and both houses in 1974 and 1975 approved legislation that, had it not been vetoed, would have imposed not mere regulation but limits on strip mining development. Those bills contained provisions to restore slope to original contour, and would certainly have precluded some coal extraction from the more steeply sloped terrain of Virginia, West Virginia, and Kentucky. Water and revegetative requirements would have stopped

surface mining development in the arid regions (under 10 inches annual rainfall) of Utah, Arizona, and New Mexico. Additional provisions forbade mining in National Forests, alluvial valleys, and places determined to be "unsuitable for surface mining." (10) Moreover, while these provisions would explicitly circumscribe some coal energy development, the strict reclamation controls would implicitly limit growth of surface mining by redirecting capital, otherwise available for development, towards non-growth expenditures for reclamation.

In 1973, Carl Bagge, president of the National Coal Association, declared it "inconceivable that Congress should be considering action (on surface mining) that would stop the current production of nearly as much energy in the form of coal as the blocked Arab oil shipments represented." (11) Bagge was wrong. It was eminently conceivable within the new framework of public values which alert politicians have recognized. And it is indeed likely that public and congressional support for such surface mining controls will prevail before this decade ends. In the meantime, the unsettled state of policy has delayed investment capital from nurturing yet another energy development. (12)

Federal water quality laws further impose limits on energy growth. The Federal Water Pollution Control Act of 1972 especially affects such water intensive developments as coal gasification and liquefaction. That law authorized establishment of New Source Performance Standards, based on "best available demonstrated control technology," for industrial plants built after 1972. For 1983 however, the Act mandated effluent limitation guidelines reflecting "best available technology economically achievable." And finally, that 1972 law dictated a national policy goal of zero pollutant discharges by 1985. (13)

Current projections indicate that a medium-sized synfuel plant will require a daily flow of approximately 50,000 tons of water. While different liquefaction processes consume varying amounts of water, all generate effluent streams contaminated by a dozen or more pollutants. For example, the Ralph Parsons design for a modest-sized (10,000 tons of coal per day) Synthetic Refined Coal plant projects 46,000 gallons per hour of waste water discharge. (14) Even after elaborate chemical treatment, biological separation, holding and settling, this plant's effluent is projected to have the following characteristics when finally discharged to the environment:

<u>Pollutant</u>	<u>Lbs./day discharged</u>
BOD (biological oxygen demand)	134.5
TSS (total suspended solids)	165
COD (chemical oxygen demand)	576
Oil and Grease	8.64
Phenols	4.8
Total Chromium	91

Even on paper, these effluent loads exceed the 1983 limitations for coke plants and petroleum cracking plants of comparable size (those standards will be similar to the as yet un promulgated liquefaction standards). (15) What does this mean? No doubt compliance with the 1983 limitations is possible, but only at far greater expense than is currently planned. This is one reason why not a single synfuel development planned in 1972 has yet approached the construction phase. Moreover, no synthetic fuel plant presently on the drawing boards could possibly comply with 1985's zero effluent goal.

The real exemplar of de facto limits to growth is the 1970 Clean Air Act, legislated in the wake of Earth Day. The provisions of that act were so radically different from those of previous legislation that they constituted an entirely new

regulatory direction, not merely an addition to existing policy.(16) The Act enunciated non-technological, non-economic criteria for regulating air quality.(17) Ambient Air Standards and New Source Performance Standards(NSPS) were based on previously established health tolerances, excluding any consideration of whether compliance was technically possible or economically feasible. This principle was revolutionary in the perspective of traditional American regulatory policy. When the Environmental Protection Agency promulgated the standards in 1971, the energy industry was appalled. The sulfur oxide standards were the chief concern of coal, oil, electric utility and smelting interests.(18) Primary standards, to be achieved by 1975, limit ambient SO_x concentrations to .14ppm in any 24 hour period, and to .03ppm for an annual arithmetic mean.(19) Furthermore, the secondary standards, with a 1978 compliance deadline, are still more strict, and include nitrogen oxide limits as well as those for sulfur oxides and particulate matter. And per its congressional mandate, the EPA went on to promulgate emission standards for new industrial plants. For example, new coal-fired, steam generating plants with a capacity greater than 250 million Btu./hr. are restricted to a two-hour maximum emission concentration of 1.2 lbs. of SO_x per million Btu., .1 lb. of particulates, and .2 lb. of NO_x(20). Equally rigorous standards were served on the other stationary sources of pollution.

Industry reaction to these regulations was overwhelmingly negative. A heated public controversy arose over the technical workability and huge costs of flue gas desulfurization(FGD) systems. The giant investor-owned utility, American Electric Power, led the debate with full page ads in the national media which

decried the woes of scrubber systems and their wet sludge byproduct.(21) In 1974, an Environmental Protection Agency hearing panel concluded that FGD systems, although fraught with mechanical problems, did work. To meet primary standards on 90,000 megawatts capacity by 1980, capital costs at \$60/kw would run a minimum of \$4.5 billion, not to mention an annual operating energy penalty 5.5 percent of generating capacity.(22) That is a sizeable pricetag just to meet primary standards five years after the 1975 deadline. And, meeting the secondary standards is even more costly. For the newest generating unit at the Four Corners Power Project in New Mexico, the unit cost of generating power was \$100/kw, while the unit cost of pollution controls, principally the scrubber, was \$125/kw to attain 90 percent SO_x removal from burning low sulfur coal.(23) And these huge outlays of capital do not include the costs of electrostatic precipitators to control particulates nor the yet-to-be invented devices for controlling NO_x.

There is a finite supply of investment capital for future energy development. When existing public policy mandates that a large portion of available capital be spent on environmental controls, the portion remaining is obviously smaller, and economic growth has been proportionately limited. The extraordinary aspect of the Clean Air Act's standards is that economic growth is simply irrelevant. The deep significance of that fact is yet to be grasped by corporate leaders who warn that environmental regulations are interfering with licking the energy crisis. Nor is it appreciated by consumers who still demand cheap electricity and pristine air as well.

Going beyond these standards, the preamble of the Clean Air Act contained a joker responsible for converting the growth debate into a national

policy controversy. The stated purpose of the 1970 Act was to "protect and enhance" air quality. (24) "Enhance" clearly meant improve dirty air in polluted urban areas. But could "protect" possibly mean keeping industrial pollution from significantly deteriorating pristine air in undeveloped rural areas? This was precisely the meaning of "protect" as it was understood by planners in the old National Air Pollution Control Administration as early as 1968. (25) And in 1973, the Supreme Court ordered the federal government to enforce no-significant deterioration in compliance with the wishes of Congress. (26) This left the EPA with the unenviable task of formulating standards that would likely preclude much economic development. In December, 1974, the EPA issued its "guidelines for preventing significant deterioration." (27) Excepting federal lands, the EPA shifted the burden of defining "significant" to the various states. Non-federal lands were to be classified in any of three categories. Air regions designated class I would be allowed to deteriorate approximately 8 percent of the secondary standard for particulates and 3 percent of the sulfur oxide standard. At the other extreme, class III air could deteriorate down to the national secondary standards. Environmentalist and industrial groups promptly initiated litigation challenging these rules, and demanded that Congress resolve the issue by amending the Clean Air Act. Congress has now been struggling with the problem for 22 months. The no-significant deterioration (NSD) rules will limit economic growth in several ways. First, they will prohibit large scale, efficient energy developments in at least five percent of the land area of the United States (mandatory class I designations). (28) Mine-mouth power plants and synthetic fuel plants generate

efficiencies of scale by locating at the site of the coal resource. Since there are extensive coal reserves near federal lands which will be designated class I, NSD will certainly inhibit some mine-site energy development. Secondly, NSD restrictions will reduce utilization of western low-sulfur coals, while the Clean Air Act standards detract from the utilization of eastern high-sulfur coals. (29) But it is in the de facto imposition of greater, non-productive capital requirements that NSD restrictions especially limit growth. The National Economic Research Associates conducted a study for the EPA, assessing the cost impact of the Clean Air Act and particularly the NSD provisions currently being considered by the Senate. (30) The study projected that between 1975 and 1990, the capital requirements to generate electricity would be \$484.55 billion. The Clean Air Act, not including the NSD provisions, would raise capital requirements by \$38.22 billion over the fifteen year period. (31) On top of that, the Senate bill (S.3219) NSD provision would increase capital costs by another \$10.67 billion. According to the study, annual revenue requirements, in addition to capital requirements, would be increased by \$47 per household per year by 1990. This would amount to a fifteen year clean air bill of nearly \$1800 for every American household. (32) If these estimates are even near accurate, then very large sums of money will be diverted both from growth-related capital investments and from growth-producing consumer expenditures. Of course, these air quality monies will contribute to the GNP in the form of new control equipment industries and wages, but like military expenditures, they will not contribute to mainstream economic expansion. In fact, they will explicitly detract from the pool of growth capital available to the energy industries. The no-significant deterioration issue has generated intense lobbying

and heated debate in Congress throughout this session. While both the Senate and the House approved Clean Air Act amendments containing NSD provisions, the bill died by filibuster just hours before the close of this congressional session. It was the two senators from Utah, the state which would be most seriously affected by no-significant deterioration, who conducted the filibuster. When established, the final form of no-significant deterioration rules will be an interesting statement of the degree to which this nation has adopted an economic philosophy of limiting growth. (33)

3. THE LIMITS OF PUBLIC VALUES

There can be little argument that federal policy since 1970 has increasingly imposed de facto limits on America's economic growth. None of the six privately owned coal gasification projects has made any progress towards construction in the past two years. (34) Recently, Southern California Edison officials glumly announced the demise of their thirteen year old, 3,000 megawatt Kaiparowits generating project. They blamed environmentalist opposition for "beating the project to death." (35) But the weight of existing federal policy in the form of NEPA requirements, surface mining and air pollution restrictions caused six years delay, a 50 percent reduction in planned capacity, and the inflation of projected costs from \$500 million to \$3.7 billion. Nuclear power is still worse off, as dozens of projects have been cancelled and the Nuclear Regulatory Commission recently declared a moratorium on the issuance of construction permits. And finally, on September 23, the House killed legislation that was to have provided \$4 billion in loan guarantees for the synthetic fuels industry.

There are those in Congress and industry who

argue that these national policies do not reflect the will of the American people. They argue that limits to growth is sought only by the radical fringe of elitist environmentalists. But a 1975 poll, conducted by the Opinion Research Corporation, "showed that 94 percent of the American people oppose a policy of dispersing air pollution into areas which still have clean air and favor keeping clean air areas as clean as they are now." (36) From this, the Federal Energy Agency has concluded that "In general, Americans are willing to pay what we have estimated they will need to pay for cleaner air." (37) In the May 25 Democratic primary in Idaho, residents of three counties overwhelmingly rejected by referendum an Idaho Power Co. proposal to build a new coal-fired power plant. (38) Citizens' groups across the nation have used the courts and the ballot to block road construction, airport expansion, and strip mine developments. The November ballots in a dozen states include referenda on nuclear power plants, throwaway containers, and utility rate hikes for financing future construction. It would seem that the people, at least a great many of them, are willing to limit industrial growth as the price of a better environment.

In a recent editorial, Llewellyn King, the publisher of the ENERGY DAILY, commented that the "opponents of nuclear power...growth and advanced technology have been moved not at all to recognize the freely expressed will of the public..." (39) I would not argue that all the goals of organized environmentalists reflect the will of the majority of the citizenry. But clearly Mr. King, and most industrial leaders, have failed to recognize the significance of a fundamental change in public values. As Mr. King suggests, "Had an environmental impact statement been required before the Wright brothers started their adventure at Kitty Hawk,

it would surely have found against the development of aviation." (40) No doubt, but in 1903, public values were not opposed to growth per se. Today, the evidence of public opinion and the direction of public policy argue strongly that public values have undergone significant change. Smaller families, lower birth rates, higher material living standards underscore this transition. Loss of community in collapsing cities and inundated rural villages have called to question Keynesian principles of growth capitalism.

This essay intends neither criticism nor commendation of limits to growth. Rather, it seeks to make two points and a recommendation. First, public values since 1969 have shown increasing willingness to sacrifice economic growth in the form of energy development for perceived improvements in the quality of life. Second, public policy since 1969 has reflected this willingness by mandating environmental regulations which have implicitly imposed limits on America's economic growth. Limits to growth is neither a threat nor a goal, but rather an accomplished fact. It is time to acknowledge this fact. Corporate and governmental energy planners must assess the implications of this new policy direction, consider alternatives, and plan accordingly. Likewise, citizens--consumers--should also examine the implications of policies limiting growth, and decide if they are willing to pay the price of a steady state economy.

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