Following two decades of applying market forces to energy, the United States is returning to ominous government intervention.

Lessons Learned and Forgotten

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At the time that this article is being written, in the spring of 2002, U.S. energy policy stands in fairly good state as compared to the heavy command-and-control policies that dominated the twentieth century. The largest and worst government interventions in the energy markets were eliminated in the 1980s, though many misguided programs of micromanagement remain.

Unfortunately, the state of the energy markets will deteriorate in the coming years following congressional passage of a revised version of President George W. Bush's energy plan. The plan, and Congress's changes to it, underscores the persistence of the flawed belief that energy markets are somehow "unique" and require public intervention to operate efficiently. The Bush plan offers a bitter illustration of how much we learned, and have now forgotten, about energy and economics.

BEFORE 1970

Prior to 1970, U. S. energy policies mainly aided politically influential sectors of domestic energy extraction. Most pre-1970s policies were special tax favors to mineral production including oil and gas (bequeathed in the 1920s), state production controls on oil and natural gas (from the 1930s), and oil import controls (from the 1950s). The only major policy that did not assist the industry — and thus did not receive industry favor — was federal price controls on natural gas (introduced in the 1950s).

Encouraging entry but limiting production As part of the phase-in of federal income taxes, Congress allowed oil and gas companies to deduct 27.5 percent of gross revenues (up to half of net income) for corporate income tax purposes. Characteristically, a tax policy that began as a technical adjustment of the tax code turned into a deliberate measure to stimulate oil and gas production. The deduction was a big hit with the industry because it far exceeded the depreciation needed for capital recovery and lowered the cost of doing business, and thus the consumer cost of oil.

Restraining "Big Oil" Though federal tax law encouraged entry, the states adopted policies that limited oil and gas production. Following a number of court decisions from early in the twentieth century that allowed such practices as "slant drilling," the states stepped in with production controls that proponents claimed were intended to prevent "waste" from those practices. The limits inevitably increased scarcity, which boosted the price paid to small producers because small, high-cost wells did not face production limits. To make matters worse, the controls failed at their purported objective and the states eventually moved to the preferable alternative of promoting private actions to control waste.

The rent's recipients — the small producers and their employees — soon coalesced into a visible voting bloc that prevented the controls' removal, even when their negative effect on consumers became obvious. Some researchers have argued that the production controls also benefited big oil companies because of higher prices; however, the big companies' losses from curtailing output and refraining from importing cheaper foreign oil undoubtedly offset any benefits for the large companies. Ironically, but not uniquely, the affluent small business owners and their employees had more political influence than the anonymous stockholders of large corporations.

The state-imposed production restrictions increased prices

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above market levels and induced a rising tide of imports that policymakers initially tried to discourage informally. In 1959, President Dwight Eisenhower made that policy official by imposing federal import quotas that were intended to maintain the price support system for domestic oil. Refineries received their quota limits on a sliding scale so that smaller refineries were assigned quotas representing a higher percentage of foreign oil than larger facilities. Later, ad hoc quotas were assigned to refineries in the Virgin Islands and Puerto Rico to promote oil refining in those territories. Then, the petrochemical industry was given quotas to offset the economic disadvantage created by the original oil quotas.

Fortunately, the jumble of misguided quotas and incentives was undone in the 1970s when shortages and high prices forced decision-makers to adopt new approaches. Unfortunately, the government then enacted a different, vastly more intrusive regulatory regime that guaranteed failure to attain its stated goals.

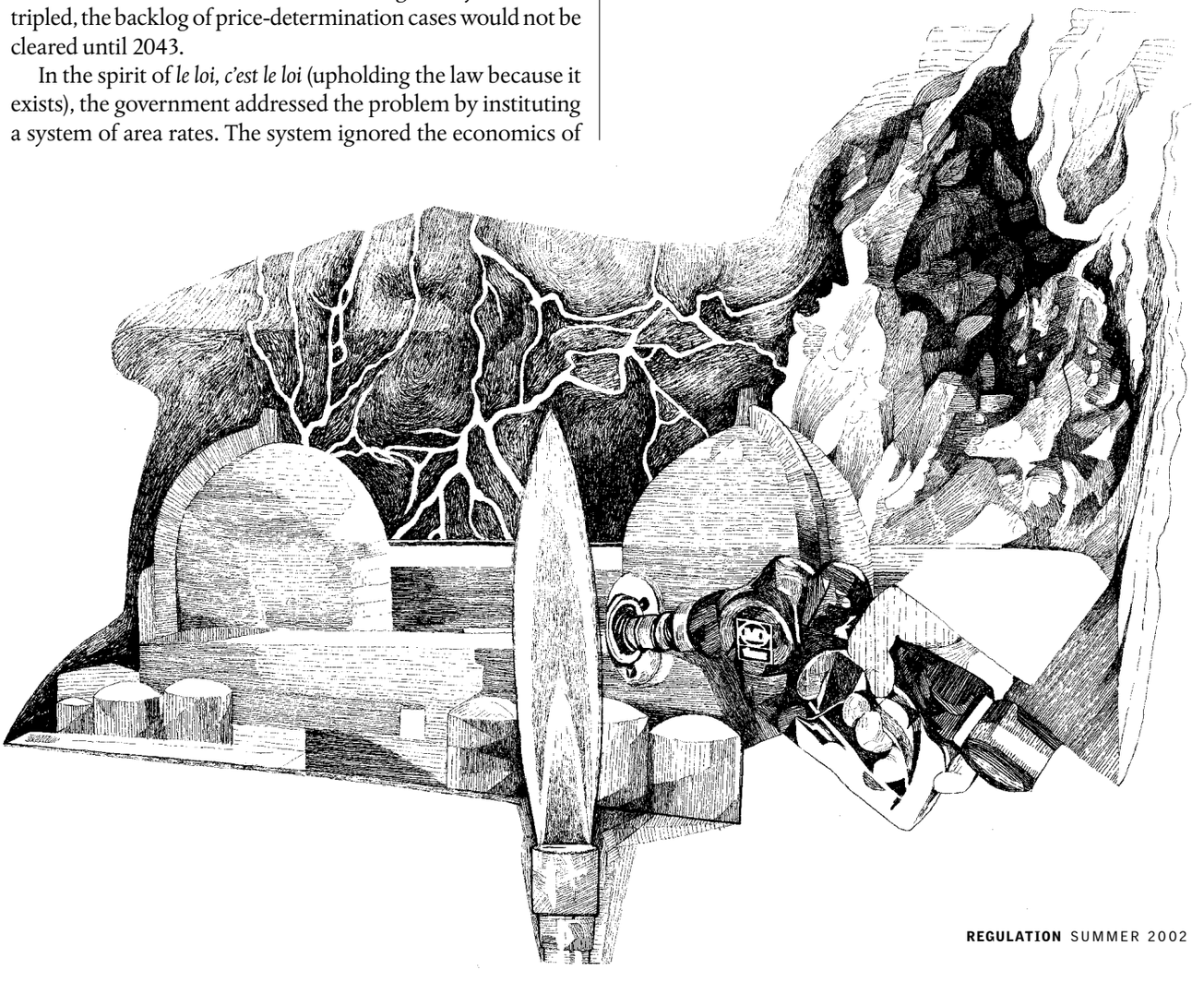
Natural gas In 1954, the U.S. Supreme Court resolved controversies about the scope of the 1938 Natural Gas Act by ruling that it required price controls over sales by producers. The decision gave the Federal Power Commission the daunting task of establishing cost-based prices for thousands of natural gas producers. By 1960, the task became so overwhelming that the commission claimed that, even if its regulatory staff were tripled, the backlog of price-determination cases would not be cleared until 2043.

In the spirit of *le loi, c'est le loi* (upholding the law because it exists), the government addressed the problem by instituting a system of area rates. The system ignored the economics of supply, in part because it only applied controls to gas that was sold in interstate commerce. Gas sold within states was not subject to controls. In the 1970s, the discrepancy between (plentiful) intrastate and (short) interstate supply availability dramatized the inherent defects of the price-control scheme and induced an overly protracted move toward a market approach. In the fashion of that decade, the move to decontrol started by making the restrictions vastly more complex

POLICY AFTER THE ENERGY SHOCKS

Energy policy of the 1970s was governed by fear of both shortages and imports, and by the belief that public policy solutions were necessary. One common rationale for public intervention in gas and oil markets was, and still is, the possibility of resource exhaustion from inadequate market foresight. That view greatly underestimates the potential for maintaining the competitive position of presently employed fuels and overestimates the prospects for rivals. The overestimates arise from both too much reliance on the belief that the costs of existing fuel sources will soon rise and excessive optimism about how fast the costs of rivals will decline.

Economic tinkering Especially in the early 1970s, U.S. energy policymakers became enamored with tinkering with the economics of energy markets. They used a number of tools: price



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controls, transfer payments, tax breaks and other political favors, and even U.S. foreign policy actions. With predictable regularity, the policies produced little benefit and often had extremely negative results.

Price controls The core of 1970s energy policy was a set of complex price controls. The scheme subdivided oil and gas output into many categories based on a combination of age and extraction-difficulty criteria. For each category, the controls then set different starting prices, established rules for adjustment, and determined when (if ever) the controls would end.

The complexities were efforts to lessen the output-restraining effects of price controls. However, the objective was unattainable because perfect rent taxation requires complete information of each producer's production costs. (To make matters worse, what is required is knowledge of the cost of each increment of production.) Moreover, the use of broad categories works only if all marginal costs of output within each category are close to the price ceiling. If output from a firm costs less than the ceiling, not all the rent will be captured. If output costs more than the ceiling, the output will not be produced. Thus, within each category, output is lost and rent remains. As a result, the theoretical potential for stimulating output will not be realized. To succeed, the policy requires circumstances totally different from those that actually prevail. In the 1970s, the policy produced such public benefits as the infamous long gas lines and sold-out gas stations.

Foreign dependence Concern over U.S. importation of foreign oil is a prime example of the persistence of muddled thinking in energy policy. Politicians simply asserted that there is a problem with depending on foreign sources of oil, and then proposed a two-track "solution": grant domestic energy producers economic and political favors and seek to curry political favor with foreign oil producers.

The proposal ignores the central reality of foreign oil: its enormous profitability to producing countries. Those countries will neither reduce supply to punish an enemy nor increase it to reward a friend. Similarly, consuming countries like the United States cannot effectively employ oil policy to harm or help a producing country. No viable punitive mechanism exists for buyer or seller because oil is so fungible; a disgruntled seller or buyer can easily be replaced. The record here is clear: On the supply side, the 1974 oil boycott harmed the nominal targets — the United States and the Netherlands — less than other countries. On the demand side, U.S. government efforts to nurture a relationship with Saudi Arabia, which date at least to Franklin Roosevelt's 1945 shipboard meeting with Ibn Saud, have neither increased oil supplies nor won significant political cooperation.

Strategic Petroleum Reserve Another product of the 1970s energy chaos was the creation of a strategic stockpile of crude oil. The stockpile received wide support, not only among politicians, but also with most energy economists who believed that the private sector could not foresee oil crises and optimally invest in inventories to lessen the shock. Only a few observers asked whether there is some market failure that prevents efficient response. Instead, proponents justified the oil reserve with (questionable) "new" Keynesian macroeconomics: Import shocks have bad effects on inflation and employment.

In response, one must ask what characteristics of the oil market preclude efficient stockpiles. No standard market-failure explanations apply. However, government failure exists: The tendency to impose price controls when markets tighten removes the natural incentives to stockpile. Government is incapable of making the credible precommitment not to expropriate rents during energy shocks that is indispensable for attaining optimal private inventories. Instead, the U.S. government attempted to offset the disincentives to private stockpilers by operating a public stockpile. However, the fear of windfalls that produces price controls also causes paralysis in public stockpile utilization; fears of federal giveaways discourage timely use. Hence, the Strategic Petroleum Reserve has not provided an effective response to short-term oil shortages.

Crude oil entitlements One of the more remarkable failed 1970s energy policies was the Crude Oil Entitlement Program. The policy mandated transfers among refiners to reduce the cost advantage of access to price-controlled oil and improve the relative position of smaller refiners. The system required payments from those with oil costs below average to those with oil costs above average. The smaller the refiner, the lower the tax on low-cost purchases and the greater the aid for high-cost purchases.

The policy had the perverse effect of encouraging imports. Refiners valued increased oil purchases at the weighted average cost, rather than the higher world prices from which they were partially sheltered.

Public lands A perverse policy response to the 1970s increase in world oil prices was an attempt to ensure that private firms did not retain the economic rents from energy production from federally owned resources. In 1984, indignation arose about the government's alleged failure to secure adequate payments for federal coal leases. (See "Western Myths and Realities," p. 38.) A congressional committee staff and the General Accounting Office studied the issue. Neither found a scandal, but neither liked the leasing procedures used by the Bureau of Land Management for tapping the coalfields.

A panel of outsiders was created to comment on the dispute. That panel, of which I was a member, predictably suggested the use of more precise evaluation techniques. Unfortunately, the information needed for those evaluations could not be obtained. With the leasing controversy raging, the government instituted a fresh moratorium on new leases. However, the controversy arose because the leasing occurred after a much longer prior moratorium. That moratorium eliminated the only reliable measure of the value of coal: bids on federal leases. In a perfect Catch-22, the federal government needed the valuation information that only extensive leasing would generate, but it refused to undertake such extensive leasing until the information was provided.

Similarly, a National Research Council panel examined

onshore oil and gas leasing. Under then-existing law, leases were subject to a competitive bid process if existence of oil and gas in a leased location was "known." However, the implementation of that provision was problematic because determining knowledge is an administrative quagmire. Congress chose to end the distinction.

Utility regulation One of the (generally) positive developments of the last quarter-century was the change in government supervision of electricity and natural gas utilities. Faced with changing energy markets and the consequences of price controls, the Federal Energy Regulatory Commission (FERC) chose to transform its vision of the proper industry model for those sectors.

Under old natural gas regulation, interstate pipeline companies were expected to provide customers with a package of long-term gas and pipeline services. The companies had to have access to sufficient gas supplies to fill the pipelines for at least the next decade. The new FERC vision split gas purchase from pipeline service.

FERC's electricity changes were more complex. The 1970s saw the breakdown of the so-called "regulatory compact" between utilities and the regulators. Historically, in return for ensured service to customers, regulators set utility prices with the tacit promise that the utilities would receive a guaranteed return on investment. As long as electricity costs and nominal prices fell, the public sector honored the compact. It was broken during the fuel and construction cost increases of the 1970s and 1980s, when regulators resisted rate increases.

In response, the Carter administration proffered energy legislation that included a provision to encourage state regulators to give favorable treatment to a narrow category of independent power producers: cogenerators (those with production nominally incidental to other activities, such as power plants at manufacturing facilities) and those using specific unconventional sources such as solar and wind. Several states, most notably California and New York, responded with excessive eagerness. Bowing to the fashion of the time, those states required that incumbent utilities sign long-term contracts with independent producers at prices that assumed continued persistent increases in fossil fuel prices. When prices fell after 1985, the policies became burdensome.

Following the 1985 decline, two factions emerged in the electric power industry. One side believed that independent production had desirable attributes that could be realized by enacting more sensible laws. The other side argued that it would be better to restore the broken compact model under which electricity generation was vertically integrated with transmission and distribution, and the rate-of-return was guaranteed. Largely because change in the regulation of independent production was far more feasible than restoring the old system, the first group's views prevailed (and the principal members of both groups became active in independent generation).

High prices produced by the independent power contracts and the political success of the independent producers caused many states to alter how they regulated electricity markets. The changes combined unregulated wholesale rates with rigid retail prices during transition periods that lasted for several years. The rigid retail prices were responsible for the collapse of the California market during the 2000-2001 winter.

The critical problem in California was the radical disparity between free-market wholesale prices and the capped retail prices. That disparity mainly resulted from a temporary increase in natural gas prices — the fuel used to produce almost half of California's electricity during the crisis. (See "Special Report: The California Crisis," Fall 2001.) Other states have smugly argued that their electricity regulatory changes preclude a California-style situation. However, any state with a deregulated wholesale market and price caps on retail sales can experience California-type profit squeezes.

The fundamental point is that "deregulated" electricity markets have not been truly deregulated. Government's heavy hand persists.

Research and development One major element of the effort to alter energy patterns over the last half-century is the array of research and development programs mounted to encourage energy initiatives. On the supply side, the federal government has spent billions of dollars on the development of such "alternative" sources as nuclear power, synthetic fuels, solar, wind, and geothermal power. On the demand side, the government has mandated expenditures by firms on research into "increased efficiency." Those efforts have brought few unquestionable benefits.

New energy sources The results of federal energy research is best exemplified in the tale of U.S. nuclear power, which is a story of an important initial success followed by many failures. The success came in the middle of the last century, when a private-sector firm succeeded in modifying the U.S. Navy's submarine nuclear reactor design so that it could generate elec-

California's problem was a disparity between free-market wholesale prices and capped retail prices, resulting mainly from an increase in natural gas prices.

tricity for civilian use. That success prompted the firm and several rivals to develop commercial nuclear power reactors. For a time, the effort appeared to be a major breakthrough; nuclear costs seemed likely to fall enough to compete with coal (particularly because environmental regulations increased the cost of coal use). Prompted by the energy madness of the 1970s, the electric-power industry announced extensive plans to add nuclear generation capacity.

Then, just as quickly, most of those plans were scrapped and the rest were delayed. Popular discussions allege that the Three Mile Island accident and its aftermath scared off utilities that wanted to "go nuclear," but the retrenchment occurred long before the mishap. The real reason for the move away from nuclear power is that the economics did not work out as expected.

What is unclear is exactly why. In particular, the role of public policy — either in creating nuclear's initial allure or its subsequent undesirability — is unclear. One thing is clear, however; the government's role in nuclear energy, which has always been large, grew significantly in the 1970s as regulators took on supervisory roles in the planning, building, and operating of plants. In notorious worst-case scenarios like Diablo Canyon in California, Seabrook in New Hampshire, and Shoreham on Long Island, the regulators allowed interveners to force extended, expensive delays in the plants' coming online. Whether that tightening was desirable is questionable, and the impact on economics is uncertain. All we know for sure is that electric utilities decided that the economics precluded initiating nuclear projects. It remains unclear whether a more rational process would restore the viability of the nuclear industry.

What is unquestionable is that the government did not know when to stop its nuclear research efforts. Even after the commercialization of the initial light-water approach, the federal government then assisted alternatives such as the gas-cooled reactor, which failed commercially. The government also invested heavily in "breeder" reactors that simultaneously produced energy from more reactive fuels, such as U235, while converting unreactive U238 isotopes into reactive ones. The reactors would extend uranium supplies. However, belief in the need for additional fuel rested heavily on the flawed belief that the uranium supply was very limited relative to demand. In a rare moment of sensibility, Carter officials killed the program, although they were motivated by environmental concerns rather than the recognition of bad economics.

Energy conservation An important byproduct of the 1970s energy policy that still persists and periodically expands is the micromanagement of technological design to reduce energy consumption. During the regime of price controls enacted in the 1970s, government-mandated fuel and energy-efficiency standards were an unsatisfactory way to offset the stimulus to consumption from price controls. The repeal of price controls has eliminated that rationale for those mandates (except in the electricity market in which state regulation keeps prices below cost during peak daytime use). Nonetheless, the standards persist and periodically are made more rigorous.

As a result of the turmoil of the 1970s, an entire conservation bureaucracy now exists that believes it can outthink markets. The National Laboratories created to develop atomic bombs now churn out studies purporting to show vast, profitable opportunities to reduce energy consumption. Researchers justify those claims using a variety of strained market-failure arguments involving imperfect information. The fantasy of a vast potential for costless reductions in energy use is regularly employed to justify actions to restrict energy consumption and production. Thus, advocates of stringent reduction of greenhouse gases and opponents of increased oil and gas leasing heavily rely on the conservation-potential claim.

CONCLUSION

Government interventions in energy markets have neither enhanced efficiency nor had offsetting desirable equity effects. That reality has greatly lessened demands for a national energy policy, the Bush energy plan notwithstanding.

The energy policy literature typically is restrained in drawing implications. However, as the other review articles in this issue of *Regulation* suggest, the failure of intervention to enhance either efficiency or equity is universal and stems from largely identical economic fallacies. Energy policy is simply another illustration of the broad case for reducing the role of government. R

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