

Renewable Energy

Not Cheap, Not Green?

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A multi-billion-dollar government crusade to promote renewable energy for electricity generation, now in its third decade, has resulted in major economic costs and unintended environmental consequences. Even improved new generation renewable capacity is, on average, *twice* as expensive as new capacity from the most economical fossil-fuel alternative and *triple* the cost of surplus electricity.

Solar power for bulk generation is substantially more uneconomic than the average; biomass, hydroelectric power, and geothermal projects are less uneconomic. Wind power is the closest to the double/triple rule.

The uncompetitiveness of renewable generation explains the emphasis pro-renewable energy lobbyists on both the state and federal levels put on quota requirements, as well as continued or expanded subsidies. Yet every major renewable energy source has drawn criticism from leading environmental groups: hydro for river habitat destruction, wind for avian mortality, solar for desert overdevelopment, biomass for air emissions, and geothermal for depletion and toxic discharges.

Current state and federal efforts to restructure the electricity industry are being politicized to foist a new round of involuntary commitments on ratepayers and taxpayers for politically favored renewables, particularly wind and solar.

Yet new government subsidies for favored renewable technologies are likely to create few environmental benefits; increase electricity-generation overcapacity in most regions of the United States; raise electricity

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rates; and create new “environmental pressures,” given the extra land and materials (compared with those needed for traditional technologies) it would take to significantly increase the capacity of wind and solar generation.

PRECARIOUS ECONOMICS

One of the centerpieces of the environmentalist agenda has long been the regulation of fossil-fuel consumption. Although anti-pollution controls are the accepted short-term solution to many of the environmental problems posed by fossil fuels, many people believe that the long-term answer is the gradual replacement of fossil fuels with other, less environmentally threatening fuel sources. That philosophy can perhaps best be described as eco-energy planning, the belief that government intervention in the energy economy is necessary to maximize environmental protection and, in the end, the nation’s economic vitality.

Renewable energy—power generated from the nearly infinite elements of nature such as sunshine, wind, moving water, the internal heat of the Earth, and the combustion of replenishable crops—is widely popular with the public and governmental officials because it is thought to be an inexhaustible and environmentally benign source of power, particularly compared with the supposedly finite and environmentally problematic alternative of reliance on fossil fuels and nuclear power.

Renewable energy is the centerpiece of eco-energy planning. Yet all renewable energy sources are not created equal. Some are more economically and environmentally viable than others. The list of renewable fuels that were once promising but are now being questioned on economic or environmental grounds, or both, is growing.

Wind power is currently the environmentalists’ favorite source of renewable energy and is thought to be the most likely renewable energy source to replace fossil fuel in the generation of electricity in the 21st century. Hydropower has lost favor with environmentalists because of the damage it has done to river habitats and freshwater fish populations.

Solar power, at least when relied on for central-station or grid electricity generation, is not environmentally benign on a total fuel cycle basis and is highly uneconomic, land intensive, and thus a fringe electric power source for the foreseeable future. Geothermal has turned out to be “depletable,” with limited capacity, falling output, and modest new in-

vestment. Biomass is also uneconomic and an air pollution-intensive renewable.

Despite its revered status within the orthodox environmental community, wind power poses several major dilemmas. First, wind remains uneconomic despite heavy subsidies from ratepayers and taxpayers over the last two decades. Second, from an environmental viewpoint, wind farms are noisy, land-intensive, unsightly, and hazardous to birds, including endangered species.

With the National Audubon Society calling for a moratorium on new wind development in bird-sensitive areas, and an impending electricity industry restructuring that could force all generation resources to compete on a marginal cost basis, wind power is a problematic choice for future electricity generation without a new round of government subsidies and preferences.

SUBSIDIES

Because of the precarious economics of acceptable renewable energy, eco-energy planners have turned to taxpayer and ratepayer subsidies for energy conservation as an alternative way to constrain the use of fossil fuels. Yet fundamental problems exist here as well. Multi-billion-dollar taxpayer and ratepayer subsidies over two decades have resulted in severely diminished returns for future subsidized (and even nonsubsidized) conservation investments. The potential reduction of electricity prices due to the introduction of electricity industry restructuring threatens to lengthen the payout period of energy conservation investments and consequently worsen the problem.

A major but largely unrecognized development in the public policy debate over taxpayer- or ratepayer-subsidized renewable generation and energy conservation has been the elevated role of natural gas in electricity generation. Not only is natural gas significantly cleaner burning and less expensive than a decade ago, it has increasingly become the “fuel of choice” for new generation capacity. The ecoenergy planning agenda for electricity generation—developed with coal and fuel oil in mind—must now be reconsidered. Such a reconsideration places in question some of the most important public policy missions of government energy agencies, from the California Energy Commission (CEC) to the U.S. Department of Energy (DOE).

ECO-ENERGY PLANNING

Eco-energy planning is a public policy paradigm favoring taxpayer and ratepayer subsidies and governmental mandates for renewable generation and energy conservation to promote “sustainable” energy development. With the end of energy shortages in the 1970s, the focus of federal energy policy shifted from price and allocation regulation to reducing fossil-fuel consumption to address ozone formation, acid rain, and climate change. The key assumption of ecoenergy planning is that state and federal air-emission standards alone are inadequate to address the public policy issues described.

The new (post-1980) mission of many state public utility commissions, the CEC, and the DOE has been to intervene in the market with incentives for renewable energy generation and conservation, particularly in the electricity-generation sector. Those government interventions or special preferences have included the following supply-side and demand-side alternatives:

Supply side:

- tax code preferences for renewable energy generation (federal and state);
- ratepayer cross-subsidies for renewable energy development (state);
- mandatory utility purchases of power generated by renewable energy sources at the utilities’ “avoided cost” (federal/state);
- imputed environmental costs (“full environmental costing”) to penalize fossil-fuel-generation planning choices (state);
- fuel diversity premiums to penalize reliance on natural gas for power generation (state);
- government payments for renewable energy research, development, and commercialization (federal and state); and
- early entry into open-access programs for renewable energy generation (state).

Demand side:

- taxpayer subsidies for energy-efficiency programs (federal and state);
- ratepayer subsidies for energy efficiency, called demand-side management (state); and
- minimum energy-efficiency building and appliance standards (federal and state).

The cumulative taxpayer and ratepayer investment in the alternatives listed is substantial. The DOE has spent approximately \$19 billion since its inception on electricity conservation (\$8 billion-\$9 billion) and nonhydro renewables (\$10.7 billion), in 1996 dollars. State demand-side management programs add approximately \$16 billion more. The \$30 billion to \$40 billion cumulative 20-year investment—not including the substantial private costs associated with building and appliance energy-efficiency standards—represents the largest governmental peacetime energy expenditure in U.S. history, outranking the Strategic Petroleum Reserve program to date as well as the cumulative expenditure of the 1974-88 synthetic fuels program.

OBSTACLES TO PLANNING

Eco-energy planning is presently confronting three major obstacles:

- renewable energy options, prominently including hydroelectricity and now wind power, have environmental drawbacks that have proven intractable to date;
- renewable energy subsidies and mandatory energy conservation are proving to be incompatible with a competitive restructuring of the electricity industry because of unfavorable economics and surplus existing capacity; and
- economic and environmental advances in the fossil-fuels industry, particularly in the use of natural gas in electricity generation and

reformulated gasoline in transportation, have reduced the environmental costs of fossil-fuel consumption necessary to justify subsidized alternatives to fossil fuels.

In contrast to eco-energy planning, market-based energy environmentalism relies on private property, tort redress, and market incentives to address environmental degradation. Secondary, ad hoc programs to reduce energy consumption or substitute alternative energy technologies are rejected either as wholly unnecessary or as inefficient. They are unnecessary given the alternatives of amending the primary air pollution standards and programs with market-based regulations or tort redress, or both. They are inefficient, given the demonstrated inability of government regulators to intelligently plan the energy economy.

In sum, eco-energy planning is predicated on the idea that energy markets are so riddled with imperfections (largely because the environmental costs of consumption are not entirely accounted for in the pricing system) that major interventions are necessary to efficiently manage society's energy choices. Market-based energy environmentalism rejects the idea that the energy economy is rife with "market failures" and questions the idea that government regulators—no matter how intelligent or well-intentioned—can improve upon the private choices of millions of economic agents in the free market. Market-based energy environmentalists maintain that the best way to ensure the efficient use of both economic and environmental resources is to rely on undistorted price data and governmental protection of private property rights.

ABOUT THE AUTHOR

Dr. Bradley's analysis of renewable energy, which was made for the Cato Institute, is available in complete form. His study has six parts. The first defines eco-energy planning and differentiates it from market-based energy environmentalism. The second details the economic and environmental problems of wind power, the most favored renewable energy alternative. The third presents the problems of the other major renewables, including "negawatts," the environmentalist euphemism for subsidized energy conservation. The fourth is a study of the major challenges to eco-energy planning posed by the ongoing restructuring of the electricity industry. The fifth is a description of new developments with natural gas that have made it a benchmark for environmental compari-

son in the United States if not abroad. Finally, the author considers the public policy implications of the conclusions for the DOE, state public utility commissions, and state-level energy commissions.

His complete Policy Analysis “Renewable Energy—Not Cheap, Not Green” is available (\$6.00) from the Cato Institute, 1000 Massachusetts Avenue N.W., Washington, D.C. 20001. For copies of Bradley’s Policy Analysis (No. 280), call 1-800-767-1241 (Pacific time, 9-6; Eastern time, noon-9 p.m.)

<http://www.cato.org/pubs/pas/pa-280es.html>

Dr. Bradley is best known for his two-volume treatise, *Oil, Gas, and Government: The U.S. Experience* (1966), described as “a landmark in regulatory studies.” His other books and essays cover the entire spectrum of energy-policy issues, from the origins of electricity and manufactured gas regulation in the last century to the Department of Energy’s civilian energy programs today. Bradley’s public policy approach combines an understanding of the historical record with market-process economics and libertarian social theory.