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OP-ED CONTRIBUTOR

Nuclear Power Can Work

By JOHN DEUTCH and ERNEST MONIZ

CAMBRIDGE, Mass.

The world needs both more electricity and less pollution. The goals are not incompatible, but the solution will require better management of demand, smarter use of coal as well as renewable energy sources, and increased use of nuclear power.

As Congress considers an energy bill when it returns from recess, it will be under pressure to expand or limit the use of nuclear power. The issue, however, is not simple. More nuclear power will be necessary — but more nuclear plants will be built only if more safeguards and incentives are put in place. The challenge is to make nuclear energy safer, cleaner and more economical.

We built a model to compare the costs of producing electricity from new nuclear, coal and natural gas plants. The model focuses on economic cost, not regulated or subsidized cost. According to our study, the baseline cost of new nuclear power is 6.7 cents per kilowatt-hour, compared to 4.2 cents for coal and natural gas (when the price of gas is \$4.50 per thousand cubic feet). Plausible, but unproved, technology could reduce nuclear costs to those of coal and gas.

However, if a cost is assigned to carbon emissions — either through a tax or some other way, as in a current Congressional proposal that would limit emissions but allow companies to buy and sell the right to discharge more pollutants — nuclear power could become an attractive economic option. For example, a \$50 per ton carbon value, about the cost of capturing and separating the carbon dioxide product of coal and natural gas combustion, raises the cost of coal to 5.4 cents and natural gas to 4.8 cents.

Even under these favorable circumstances, the regulatory uncertainty threatening the large-scale investment needed for a nuclear plant will require some government assistance. A production tax credit, similar to that extended to wind power, is a good idea. It would give private investors an incentive to complete a plant. If no plant is built and operated, no public money is spent. If the first plants are indeed built and operated competitively, more will follow and the possibility of reducing greenhouse gases increases.

Besides cost, there is the problem of nuclear waste. While it is technically possible to dispose of spent fuel safely, the issue is actually doing it. Successful operation of the planned Yucca Mountain repository in Nevada would be an important step.

But the Department of Energy's nuclear waste research and development program should consider solutions beyond mined depositories like Yucca Mountain. For example, burying spent fuel several kilometers deep in a dry well, called a borehole, may offer significant cost and environmental benefits compared to mined repositories. This and other possibilities should be systematically explored.

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Finally, there is the challenge of nonproliferation, which is complex because of its international dimensions. There is no question that the current nonproliferation regime needs to be strengthened. Particular attention must be paid to enrichment technology and reprocessing. Enrichment, which converts natural uranium into reactor fuel, can produce uranium well beyond reactor grade, suitable for weapons. Reprocessing separates plutonium metal, which can be used directly in weapons, from reactor fuel. There is ample uranium available so that reprocessing can be avoided for at least the next 50 years.

In the near term, the priority should be to require signatories to the Nuclear Nonproliferation Treaty, like Iran, to accept inspections of suspected but undeclared nuclear facilities. For the longer term, advanced nations that operate nuclear facilities should offer to provide fuel to reactors in less developed nations — and to remove all spent fuel.

Nuclear power can make an important contribution to meeting the world's growing electricity needs while helping to reduce carbon emissions. But this contribution will be realized only if the United States and other nations focus on making today's technology work and avoid expensive advanced technologies that involve reprocessing, which presents serious proliferation risks.

It will be difficult, of course, to carry forward this nuclear agenda. Yet it will also be difficult to limit greenhouse gas emissions adequately while satisfying global energy needs for social and economic development. In both of these endeavors, American leadership is essential.

John Deutch, professor of chemistry at M.I.T. and former director of central intelligence, was in the Energy Department from 1977 to 1980. Ernest Moniz, professor of physics at M.I.T., was in the Energy Department from 1997 to 2001. They directed a recent M.I.T. study on nuclear energy.



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