Comment on MIT study "The Future of Nuclear Power"

A letter to correct the public record

Nuclear News's otherwise fairly accurate September 2003 report of the MIT study "The Future of Nuclear Power" says it found that "billions of tons of carbon dioxide emissions into the atmosphere could be avoided by 2050 only by drastically increasing the number of operating nuclear power plants [to 1 TW]...." The MIT study said no such thing. It was built around a 1-TW-by-2050 scenario, which it found could avoid 1.8 GTC/y (a fourth of the projected incremental carbon emissions). But it couldn't have found that "only" such trebled nuclear capacity could achieve this result, because, as its Executive Summary states, "We did not analyze other options for reducing carbon emissions—renewable energy sources, carbon sequestration, and increased energy efficiency—and therefore reach no conclusions about priorities among these efforts and nuclear power"—let alone about what the non-nuclear ones could do.

Therein lies the unreported basic logical flaw of the widely misreported MIT study. Nuclear power faces, as the Executive Summary says, "stagnation and decline," chiefly because it's uneconomic. The study correctly finds that "In deregulated markets, nuclear power is not now cost competitive with coal and natural gas," but major cost reductions "could reduce the gap," and very large "Carbon emission credits, if enacted by government, can give nuclear power a cost advantage." Yet that advantage is only against other (coal and gas) central-station options that the market is rejecting because they're all uneconomic, with U.S. utilities' ordering rates shrunken to Victorian levels.

The market winners are chiefly distributed gas-fired co- and tri-generation (which the study doesn't mention even as an omission), windpower, and end-use efficiency. The study finds that new nuclear plants' busbar power under current conditions costs 6.7¢/kWh (levelized 2002 $). For conservative comparison with distributed options, we must add to nuclear or wind busbar cost the empirical 1996 investor-owned utility's embedded average delivery cost of 2.6¢/kWh in 2002 $ (marginal delivery costs more). Compared with new nuclear plants' 9.3+¢/kWh delivered, their three unanalyzed competitors are thus respectively about 5-10x (net of thermal credit), 2x, and 10-30x cheaper today, and the latter two would be equally advantaged by carbon pricing.

Yet the study "did not analyze" any of them—its simplistic projections of electricity demand didn't even mention efficient use, let alone model its competition with supply—so it reached no conclusion about their competitiveness or capabilities. It nonetheless emphatically asserted that "it is likely we shall need all" these technologies, and "In our judgment, it would be a mistake to exclude any...at this time," so nuclear power merits increased subsidies.

Readers might be forgiven for supposing that somewhere, the 170-page report provides an analytic basis for that striking claim. It doesn't. The alleged need for all options, including nuclear power, is purely the authors' personal opinion wrapped in a big study of other questions. Also unanalyzed and unmentioned, therefore, is the key policy issue of opportunity cost—how the expanded nuclear subsidies they urge would divert resources from its competitors and thus slow their adoption.

The study recommends useful policy shifts on reprocessing and nonproliferation. Yet, disappointingly, its very capable authors spent so long examining uneconomic traditional energy technologies that they had no time left to consider the successful, less centralized options that, despite an unfavorably tilted playing-field, are rapidly displacing them. Global windpower (which could more than power the world), for example, grew in 2002 from 24 to 31 GW—over twice nuclear power's average 1990s annual addition.

—Amory B. Lovins, CEO
Rocky Mountain Institute
Snowmass, Colorado