

# Renewable energy: tomorrow's promise

Last week we described some of the basic characteristics of several alternative energy sources. They are either inexhaustible (solar, wind, and even nuclear) or renewed through natural processes (hydropower, plant-based fuels). In direct use they usually emit fewer or no conventional pollutants and greenhouse gases.

The contribution of these energy sources to U.S. needs now ranges from less than one-tenth of one percent (wind and solar power) to about 3 percent (hydroelectric and biofuels each). Nuclear energy provides 8 percent alone.

Everyone recognizes that at some point there will be a move away from primary reliance on fossil fuels to much greater emphasis on other sources. Today, fossil fuel reserves

appear to be adequate for 70 years (oil) to more than 250 years (coal) at current consumption rates, but they are not inexhaustible.

Yet whatever their promise, as the nearby chart indicates renewables are now generally costlier than fossil fuels. Solar power, for example, is currently 8–10 times more costly.

In addition, some renewables (solar, wind) have highly variable output and cannot store energy. And each faces issues related either to safety (nuclear) or siting. Most difficult are the enormous land-use requirements that biofuels, wind and solar would face in broad application.

Therefore, considerable research is being devoted to overcome existing technical and economic barriers. For example, nuclear research could lead to less expensive but safe designs; biofuels research may eventually allow the conversion of crop waste to fuel at reasonable cost; photovoltaic solar electricity may reach cost levels

of fossil-fuel generation. Breakthroughs are certainly possible, and experience has shown that we should be optimistic about the prospects for advances over time.

Nevertheless, even assuming optimistic technology scenarios, we believe it will take at least 30–40 years before a renewables' energy infrastructure could be built up from its current level and start contributing significantly to our energy supplies.

In our view this outlook implies several general policy directions:

**First, government policies should support long-term research** on alternatives but let the marketplace decide which technical approach will gain commercial and consumer acceptance.

**Second, strictly political approaches should be de-emphasized.** With a more objective perspective, nuclear energy should be re-visited for its promise and renewables such as biomass accorded less subsidization.

**Third, policies should recognize the continued requirement for fossil fuel supplies** and adopt approaches that support additional and timely supply development, environmental protection, and energy efficiency.

The key to the success of renewables is enough technological progress to ensure the energy provided is economical and environmentally sound. Past technological progress, coupled with an effective use of resources and cooperation among business, academia and government, gives much hope for the longer-term promise of renewables. Meanwhile, fossil fuels must be relied upon to meet society's immediate and near-term needs.

