

Energy 2006: The Future of Alternative Energy

A "State of the Debate" Essay written for the 2006 World Economic Forum

High oil prices are making alternative energy sources, such as biofuels, look more attractive but existing trade agreements are proving a barrier to progress.

- 1) Can biofuels play a significant role in meeting global energy demand?
- 2) What are the critical risks and structural barriers to the production and trade of biofuels?
- 3) How might an ambitious Doha Round accelerate biofuel exports and their use?

A wave of optimism and investment is surging through alternative-energy companies and researchers. And, unlike the enthusiasm that followed oil shocks in the 1970s, most believe today's surge is likely to be longer lasting.

In fact, the International Energy Agency predicts that \$1 trillion will be invested in renewable energy sources (not counting hydroelectric dams) by 2030. Driving forces include concern about global warming triggered by hydrocarbon economies, worries in many nations about energy security, and new technologies that are reducing the price premium for alternative energy.

This year, for example, Japan will phase out subsidies for solar-power installations, because cheaper photovoltaic collectors have made the price of solar electricity competitive with that from conventionally powered utilities in some markets. Italy's Enel is switching its 30 million metres to "smart" versions, which allow the utility to correlate power use with time of day, and charge more for peak-hour energy consumption. Experts say that kind of fine-grained pricing will give businesses and consumers more incentive to use alternatives.

On the other hand, while the sun, wind, geothermal vents and sea currents have provided new methods of generating electricity, many note that some energy needs cannot be satisfied by these sources. Vehicles powered by the internal combustion engine, for example, account for 40% of demand for fossil fuels in a developed economy. Practical electric automobile engines and hydrogen fuel-cell engines are still out of the grasp of most consumers. Some industry observers say these innovations are increasingly being used in hybrid cars to increase acceleration, not fuel efficiency.

Accordingly, the importance of biofuels produced from crops is rising. Both biodiesel (organic oils combined with alcohol, often mixed with gas or diesel) and ethanol (produced by fermentation from grain, corn or other plants) have seen consumption rise in the past decade. Ethanol, according to BP's annual world energy survey for 2005, is expanding especially in the US and Brazil. In 2004, Brazil used some 250,000 barrels per day of ethanol, and the US consumed 220,000, the report says. Although researchers think it might be possible to genetically engineer algae to produce biofuels, the main sources for the foreseeable future will be agriculture and recycled waste oils. Peanut oil used in cooking, for example, has been used to power cars.

To some, these developments are an added argument for lowering agricultural trade barriers, which, according to the anti-poverty group Oxfam, continue to impoverish farmers in the developing world. However, some environmentalists see a dark side. Agriculture, they note, takes a heavy toll on the ecosystem. Already, several environmental groups report, demand for oil crops is a leading cause of deforestation in South-East Asia and South America.

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