Is Bioenergy Stalled?

"Can bioenergy deliver the development goods, or is it a developmental cul-de-sac?" The question, posed at a recent conference on biomass energy, reflects the unfortunate fact that despite years of talk and research, there has been little progress in harnessing bioenergy in the service of development.

Biomass—mainly wood, crop residues, and dung—is the primary source of energy in the developing world. But there are only a handful of instances where bioenergy is supplying a significant fraction of an area's power needs—such as Brazil's sugarcane-ethanol conversion scheme, the manufacture of biogas from dung in China's Szechwan Province, and tree plantations that supply feedstock for power plants in the Philippines.

At the conference, which was sponsored by the World Resources Institute and Rockefeller Brothers Fund, the assembled experts agreed that technological obstacles to efficient bioenergy systems were insignificant compared with social, economic, and institutional impediments.

Biomass energy systems, to be economic, must be multipurpose, combined with food, fodder, fuel, fiber, or fertilizer production. They rely on local raw materials, labor, and initiative. Bioenergy thus cuts across all sectors of the economy and is intimately involved with local patterns of domestic and economic activity. Even relatively simple technologies such as efficient cookstoves have not been widely adopted because of developers' failure to understand local needs and preferences.

Most conference participants seemed convinced that bioenergy systems have boundless potential for contributing to national self-sufficiency, spurring rural development, and slowing environmental erosion.

But prevailing forces are hostile. Economically, bioenergy development is being elbowed out by a vicious cycle. Government oil subsidies hold the price of biomass fuels far below their real value, and price controls on agricultural products prevent farmers from making long-term investments, and drive them further into marginal lands as prime agricultural lands are devoted to export crops—which in turn are used to buy oil.

Furthermore, most bioenergy systems are not now particularly economic unless social and environmental benefits are calibrated into the equation. Payoffs are long-term. Private investors are wary, particularly because of the thorny issues surrounding ownership of the resource base.

There are also powerful institutional impediments to bioenergy. It has no institutional focus within governments, where agriculture, energy, and forestry ministries pursue separate agendas. Research, focused in developed countries, is divorced from practice. And training in bioenergy systems, according to one participant, can only be had in two places—the University of Nancy in France, and the University of Hawaii.

The evidence to date indicates that change requires support from the highest levels of government. But biomass, the "poor peoples' fuel," is something developing countries want to get away from. Cornell biologist David Pimentel observed that as far as political sex appeal goes, agriculture has low status in most countries, forestry is lower, and biomass is "the pits."

The contrast between the visions of technologists and the grass-roots realities is probably as striking in the bioenergy field as in any other aspect of development. For example, Princeton physicist Robert Williams, of the Center for Energy and Environmental Studies, gave a presentation demonstrating that it is possible for the entire world to enjoy a standard of living comparable to Europe in 1975 while reducing per capita energy use by half. By 2020, he said, new wood-efficient cookstoves could be converted to gas; gas-turbine cogeneration could open the way to efficient, decentralized local industry; and biomass-derived fuels could supply energy for transportation.

But a hint of the political obstacles that plague even modest efforts at change was offered by Wangari Maathai, founder of Kenya's social forestry or "Greenbelt" movement. Maathai, a farmer's daughter who holds a master's degree in biology from the University of Pittsburgh, has tangled with the government and even spent time in jail. The Greenbelt organization has a simple function, which is to supply seedlings and advice to groups around the country who want to start tree nurseries. It has been an uphill struggle, particularly since a major goal, according to Maathai, is to provide women with income-producing activities without "threatening the men," who otherwise "will rise up against you." Maathai has gained an international reputation for her work, and said Kenyan president Daniel Arap Moy now "likes to be seen planting trees."

Although the conference supplied a good picture of the bioenergy landscape, several speakers expressed frustration at the continuing absence of prescriptions. "I have gotten no concrete guidance from this conference," cried the Israeli participant Uri Marchaim. People were skeptical that either national governments or private industry would take the lead in bioenergy development, and international aid is on the decline.

The consensus of the meeting appeared to be that the impetus for bioenergy must come from the grass roots, so a priority must be the promotion of information networks and strengthening of the technical expertise of nongovernmental organizations (NGO's). There are signs that a constituency of sorts is beginning to organize around bioenergy. Al Binger, director of the new "energy cane" project in Jamaica, is organizing a Bioenergy Users Network among less-developed countries, with some help from Agency for International Development. The United Nations Development Program has a new project to encourage NGO's, and the Rockefeller Brothers Fund has set up an agribusiness consortium to engage in joint agricultural projects, including biomass, with developing countries.

The prevailing assumption among policy-makers worldwide is that fossil fuels will continue to supply the engine for development. But, according to a recent paper from Worldwatch Institute, most global energy analysts project a rise in energy use of 125 percent by 2025, which would include a requirement for two more Saudi Arabias' worth of oil. Assuming these resources become available, the environmental and economic costs will be so staggering that, as one conference participant said, "There is no competition [between bioenergy and conventional fuels] because there is no choice."—**CONSTANCE HOLDEN**