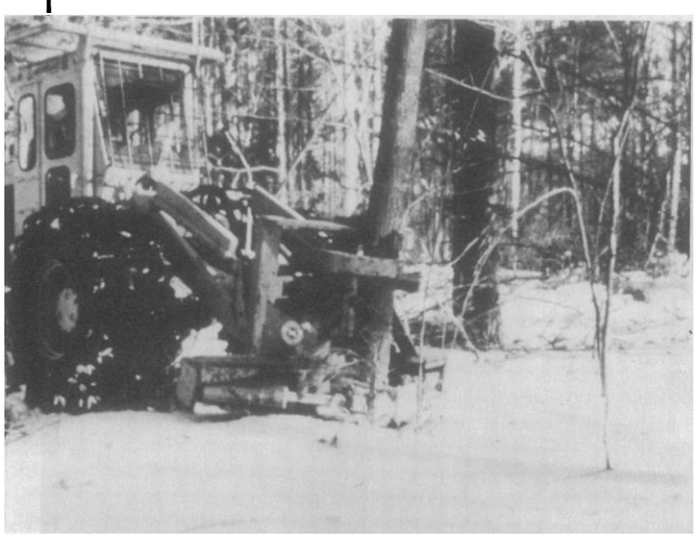
Experts Endorse Biomass Energy

Biomass energy, often ignored as a promising alternative to oil, received its day in the sun with the convening of the Bio-Energy World Congress and Exposition in Atlanta, Georgia, late in April. Nearly 1700 scientists, businessmen, and policy-makers, one-quarter from foreign nations, gathered for a week to discuss various means of squeezing usable energy out of trees, crops, manure, seaweed, algae, and urban waste. Biomass contributes a small percentage of the world's energy supply at present, but several nations have begun ambitious programs of biomass energy development, including Sweden, Brazil, and China.

Biomass in the United States contributes 2.5 percent of the total supply, but this amount can be doubled by 1990 and then doubled again by the year 2000, according to Thomas Stelson, assistant secretary of energy for conservation and solar applications. Similar goals have been set in Sweden, where biomass is considered the best means of reducing the country's heavy dependence on imported oil.



This new tractor roams through dense forest, digesting grown trees in seconds and spitting them out as wood chips, easily convertible to biomass energy.

Lars Rey, executive director of the Swedish national energy board, told the conference that the complexity and diffuseness of biomass has probably delayed its acceptance in the developed world. Virtually the only energy form to capture the public imagination so far is production of ethanol from grain, an energy form that few experts at the conference endorsed. S. David Freeman, chairman of the Tennessee Valley Authority, noted that "corn-based alcohol may be good business for the farm lobby, but it can be very expensive for the rest of us. Breaking the OPEC habit by digging into our bread basket poses the grave risk of driving up the price of food in a hungry world."

Brazil is frequently pointed to as a nation with a major successful investment in energy derived from grains: it presently runs 330,000 automobiles on a water and alcohol mixture, replacing 10 percent of its previous oil supply. Brazilian representatives at the conference said they wish to double this in five years, with an eventual goal of total replacement. Most of the cars are built at the factory to accommodate the mixture, while older models are altered through low-cost government programs. Three factors suggest this experience is not easily transferable elsewhere. First, Brazil already has plentiful crops of the sugarcane and cassava from which the fuel is derived. Second, the fuel mixture demands a low engine vapor temperature, not possible in a colder climate. Finally, even these advantages may not create a good economic investment in and of itself; Brazilian officials say they support it primarily because it provides jobs and reduces the nation's dependence on foreign oil. The picture could be altered in the near future by improvements in alcohol production, particularly in separation techniques, and through more efficient uses of production residues.

Most of the speakers agreed with Freeman that wood, and not grain, "is the most abundant and easily accessible bio-energy resource." Eight percent of Sweden's energy supply, for example, is presently derived from wood bark and pulp residues, which are used to generate heat and electricity primarily within the paper industry itself. Sweden intends to boost this percentage by more intensive harvesting of waste wood lying around in forests, and through the planting of so-called energy forests of fast-growing trees such as willow and birch.

Wood is also thought to be the best source of biomass energy in the United States, where roughly 5 million tons of dried wood residue are available on forest floors—enough to supply 7 percent of the nation's needs. Officials in the state of Georgia have decided that one-quarter of the state's energy needs can be supplied by biomass derived from wood by 1995, with small additional amounts supplied by the production of liquid fuel from kudzu and kelp farming. The state forestry commission, in cooperation with the Georgia Institute of Technology (GIT), plans to install demonstration projects that convert wood chips into wood gas at a state hospital, several schools, and possibly a textile mill and a carpet factory. William Bulpitt of GIT says the projects will recoup their initial costs in less than 5 years through savings over oil and natural gas.

At present, the world's largest user of bio-energy is the paper industry, whose officials are surprisingly cool about expanded use of wood resources. Marshall Hahn, president of the Georgia-Pacific lumber company, told the conference, "Our greatest concern is that in a rush to replace oil and gas with any possible alternative, our government will subsidize an uneconomic use of wood as fuel; in doing this, it could disrupt existing forest industries and create shortages of building and paper products." Presumably, increased demand for wood as biomass will force prices up, making lumber less competitive with synthetics. Hahn went so far as to endorse continued reliance on coal and nuclear power, perhaps the least popular suggestion by any speaker. Officials in Georgia and elsewhere seek to calm industry fears by claiming that biomass could use only waste wood, leaving traditional markets untouched.

Also mentioned at the conference was the anaerobic digestion of agricultural wastes to produce heat, used by an estimated 30 million peasants in China and of potential use in any developing country.—R. JEFFREY SMITH