

### 3. WOOD

Wood has been used as a fuel in this country since it was first inhabited. In fact, the burning of fuel wood is probably as old as civilization and continues to a greater or lesser extent throughout the world today. Wood is certainly Canada's most abundant biomass resource. It is available in most parts of the country either as waste material produced by the forest products industry or as standing, living biomass. In the future, with proper management of Canada's existing forests (which has not traditionally been the case) and with the development of energy plantations on marginal or abandoned farmland, this country's biomass resource could significantly increase in size.

At the present time biomass supplies about 3.5% of Canada's energy requirements (somewhat more than that contributed by nuclear fission), most of which is derived from our forests. Its main use is for the production of process heat and steam and, to a lesser extent, electricity. Virtually all of it is utilized by the forest industries.

The \$104 million Forest Industry Renewable Energy (FIRE) program was designed to replace fossil fuels used in the forest industry by unutilized combustible biomass residues. Its goal is to save the equivalent of 23 million barrels of oil per year by 1985. FIRE provides financial incentives to the forest industry for the installation of proven biomass energy equipment and the companies involved receive progress payments of up to 20% of the eligible costs of approved projects. The program was initiated in 1978 and to date some 45 applications for assistance have been approved at a total commitment of \$21 million. The type and distribution of fuels replaced through the FIRE program are shown in Table 6-3.

Most FIRE funds have gone to pulp and paper mills rather than to the wood industry as the former generally have a higher energy consumption per unit of product output than the latter. Energy consumption for pulp and paper manufacture amounts to about 20% of the value added compared to less than 5% for wood products. Pulp mills require larger, more expensive and more complex energy systems, and it is easier to promote the program among 150 pulp mills than among the approximately 8,000 wood operations.

The Federal Government has also provided \$30 million for the period 1978 to 1984 through the Energy from the Forest (ENFOR) program to help fund research projects and demonstrations of innovative techniques in biomass resource production and conversion. ENFOR is administered by the Canadian Forest Service of Environment Canada and evaluates proposals for biomass plantations, wood combustion and gasification, and liquid

Table 6-3: CONVENTIONAL FUELS REPLACED PER ANNUM BY "FIRE" PROJECTS APPROVED TO 22 JUNE 1980

Type of Fuel Replaced	Per Cent of Total
Oil	70.0
Natural Gas	23.4
Coal	3.8
Electricity	2.7
Propane and Butane	0.1
	100.0 <sup>(a)</sup>

<sup>(a)</sup> So far the equivalent of 2.5 million barrels of oil per annum has been replaced.

Source: Canada, Department of Energy, Mines and Resources, 1980f, p. 12.

fuels production from biomass, to name some of the most important. As of early 1980, the Government had funded some 46 projects worth around \$3.7 million.

### CONCLUSION

**The Committee concludes that the ENFOR and FIRE programs have been largely successful and applauds the recent announcement in the National Energy Program of a near tripling of the budget for FIRE.**

Some say the amount of energy derived from biomass (primarily wood) could be trebled by the year 2000, an optimistic view which is shared by the Committee. The main problems to be overcome are those inherent in the resource itself: the size of the capital investment required to allow exploitation of the resource, and the lack of a well-developed commercial and industrial infrastructure geared to the harvesting, distribution and utilization of biomass in its many forms.

Many of the disadvantages involved in exploiting all forms of biomass, such as its low energy density, its variety in form and the attendant difficulties in its transportation, can be mitigated to a large extent by upgrading. This can be achieved by such means as pulverization, drying and densification, or chemical conversion. In fact, a variety and combination of steps can transform the organic matter of biomass into standard commodity fuels which are both convenient and economic to ship, store and burn.

There are many ways wood can be used to provide energy (Figure 6-7). It can be burned directly to provide