

ficult to gauge today. Our conjecture is that geothermal energy will be a substantial contributor to Canada's energy system in the twenty-first century.

Wind energy will be a modest contributor in Canada's future energy mix. In according it this secondary importance domestically, we nonetheless see a substantial opportunity for Canada to develop an exportable wind energy technology. Unless seized upon quickly though, this opportunity will be lost since other nations are developing this technology as well.

Beyond saying that electricity should not be generated through the combustion of fossil fuels, the Committee is not able to state what methods will be used to produce the bulk of Canada's electric power in the next century. Obviously Canada will continue to develop its hydraulic resources but, equally clearly, hydro-electricity can satisfy only a part of future needs. Solar radiation will be exploited for electric power production but we see that use coming in specialized applications or settings. (The principal contribution of solar power will probably be in the supply of low-grade domestic, commercial and industrial heat.) Nuclear power, by means of the fission process or perhaps ultimately through the fusion reaction, is capable of providing electricity on an indefinitely large scale. Exploiting nuclear energy, however, is one of the more contentious political issues of today and whether or not Canada utilizes this source in a major way in the twenty-first century is a question which goes well beyond that of the adequacy of supply.

Recent discussions on energy matters in the industrialized nations have frequently been concerned with the relative merits of two policy paths. The *hard energy path* is described as a high-energy, nuclear, centralized and electricity-dependent route; the *soft energy path* is presented as a lower-energy, nuclear-free, decentralized and less electrified route. The Committee regrets this structuring of the debate into one characterized by only two choices — a "soft" or a "hard" energy alternative. It is misleading to the public to suggest that there is only one obviously correct path for Canada's complex energy system to follow, or to suggest that our energy future must be selected on an either/or basis. We do not debate the fact that the world's energy requirements must ultimately be met from sustainable sources. What is debatable are which sources will be exploited and to what extent, the length of time the restructuring of our energy system will require, and the route by which that restructuring will be achieved. These are highly complicated matters and their resolution will only be made more difficult by pursuing the debate in simplistic terms. Canada's energy choices will in part be governed by opportunity and in some cases by necessity. We must keep in mind too that Canada has a huge investment in its existing energy system, an investment from which the country will have to obtain as much return as possible. It

is therefore our conclusion that Canada's energy system will be a mix of hard and soft technologies combined with a blend of centralized and decentralized sources as far as we can see into the future.

There will nevertheless be a fundamental recasting of our national energy system, the foundation for which will be laid over the next two or three decades. During this transitional phase, natural gas, coal, hydro-electricity and nuclear-electricity will be exploited on a larger scale than today, both because of projects presently under construction and because Canada must emphasize some of these sources in progressively reducing its dependence upon petroleum. The increased importance of natural gas and coal will be transient, however, and the significance of these commodities will in turn diminish in the next century as alternative forms of energy are brought into wider use.

Society can tolerate the increased use of some energy commodities over a limited period of time even if it is not prepared to exploit certain energy forms indefinitely. Canada can, for example, promote a technology such as fluidized bed combustion to reduce the environmental repercussions of burning coal. But the Committee is not prepared to recommend that coal be the central element of a Canadian energy system fifty years from now. As already indicated, we believe that the environmental price would become larger than society should be asked to pay. For parallel reasons we do not recommend the completely unrestricted use of biomass as a source of energy in the future. We have concluded that the environmental implications of such exploitation are not adequately understood.

It is one thing to say that Canada has a broad range of energy opportunities and that we should get on with the job of pursuing them. It is quite another matter to ascertain whether or not this country actually has the means and the will to capitalize upon these opportunities. Canada has not demonstrated that it possesses the research and development capability to accomplish a basic restructuring of its energy system. Canadians have not yet indicated that they are willing to pay the cost of pursuing new energy options to commercialization, and Canada's resources of professional and skilled manpower are not so extensive that one can be complacent about our ability to get the job done. In short, the Committee considers that Canada is not adequately prepared to accomplish what Canadians are now beginning to agree should be done.

We do not lay the blame for this unreadiness at the feet of Canada's scientists and engineers — indeed, the Committee was frequently impressed with what is being accomplished with meagre resources. We do fault the management and sometimes erratic support of R&D in this country. The energy initiatives put forward in this