The demand for primary energy in Canada has increased at an average annual rate of 4.3 per cent. Since the 1950s, there has been a shift from coal to oil and gas. Hydro electricity's share has remained constant. At present, about two-thirds of our primary energy demand is satisfied by oil and gas, one-quarter by hydroelectric generation, one-tenth by coal, with wood and nuclear power accounting for the rest.

The Science Council of Canada Report No. 23 in 1975 has warned that by the mid-1980s, Canada will be producing much less oil than it uses; the shortfall may be as high as one million barrels per day, resulting in an oil trade deficit of almost four billion dollars per year. Besides heavy funding for nuclear power research, the Council proposed urgent support for wind power, geothermal energy, tidal power, biomass energy, energy from waste and solar power. They suggested that Canada should make an effort to shift as many energy requirements from the non-renewable resources, that will become scarcer and more expensive with time, to the so-called renewable sources. Solar heating, for example, could supply 40 per cent of residential requirements or about 8 per cent of the national energy use. The benefits to the country as a whole would be a reduction of pollution, conservation of fossil fuels, freedom from the vagaries of the international market place.

This total dependence of the Canadian economy, and the whole world for that matter, on liquid fuels from petroleum is a national concern. These precious nature-given liquids and gases are essential as raw material for our chemical industry and most importantly our land and air transportation systems. Unfortunately nearly 30 per cent of our petroleum black gold is simply burned for the heating and cooling of buildings. Space heating could be served readily by the alternative renewable energy sources thus freeing petroleum to do mechanical work for us.

In view of the situation that demand for petroleum will exceed readily available supply, it is important that we seek the development of the alternative energy sources in order to conserve petroleum for more important jobs. The alternative energy sources for space heating and cooling which will most probably be of significant quantity and availability to supplant our use of fossil fuels will be nuclear, wood, biomass and solar.

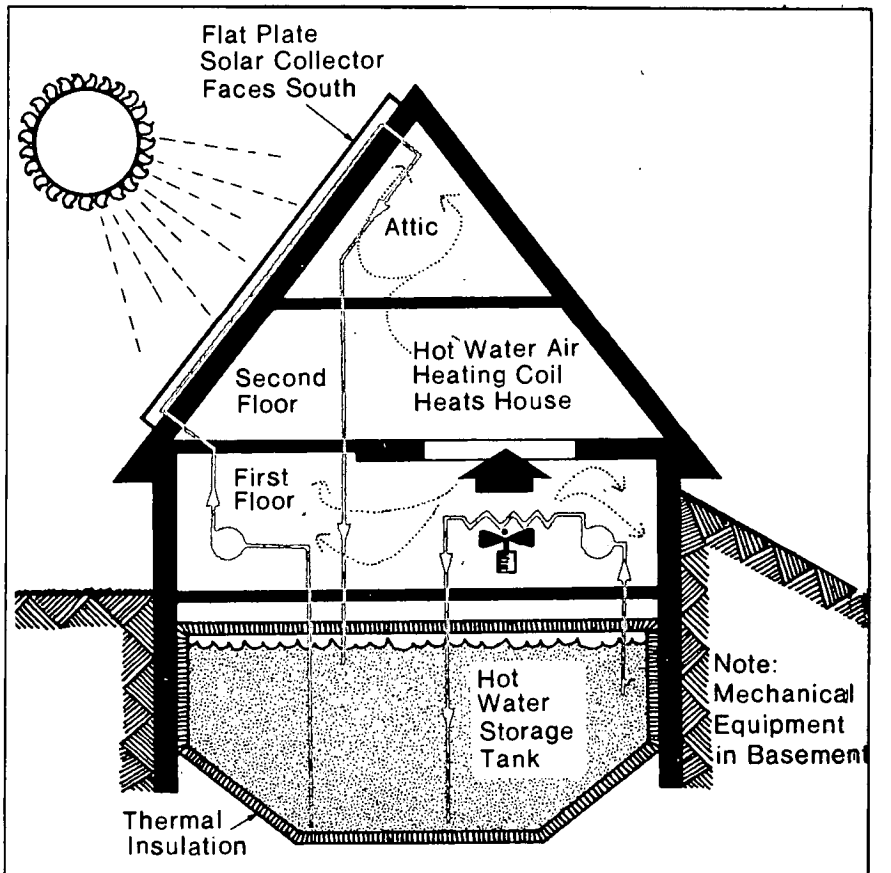
When dealing with the design of buildings that will incorporate renewable energy alternatives such as solar heating collectors and energy storage, it is essential if not imperative to realize that the building must be based on rigorous principles of energy conservation design. Today the cheapest energy per sq. ft. of the building is saved through energy conservation, not that produced by renewable energy systems or delivered by tank truck and burned in the mechanical room.

Arthur D. Little Inc. see a $1.3 billion market in the US for solar heating and cooling by 1985. Of all the programs and incentives that will need support, the development of alternative energy sources for space heating ranks very high. This is mainly because of our low-first-cost mentality and our attitude that buildings and houses are speculative ventures. I don't want to count the number of times I have heard developers say that they do not want to break new ground. The free enterprise world of building development, as most architects will attest, is extremely conservative. Incentives must be given by government. Government intervention must be catalytic.

Alternative energy industrial growth cannot occur until corporate decision-makers have a clear understanding of how energy prices will be structured and which energy alternatives will receive increased government support. Positive government action is necessary to accelerate the development by the articulation of an explicit, consistent and coherent national energy policy.

If the development of these renewable, non-polluting sources of energy does become part of a national energy policy, the government could create certain economic incentives to encourage market development and public acceptance. For example, subsidized interest rates for homeowners, accelerated depreciation for the commercial market, tax credits, and mortgage programs could give added impetus.

Along with increased government support of research and development programs and demonstration programs, the new industry could benefit from the modification of existing building codes, the establishment of a central source of standards and research literature on alternatives, and government assistance in overcoming institutional barriers within the construction industry. Legislation will be required to define and protect "sun rights" and wind rights.



Totally solar heated house using annual heat storage