

undoubtedly great potential for demonstration programs with potential industrial spinoff. The first step would be to explore possibilities and interest in joint demonstration projects and proceed to implementation of such projects where circumstances warrant.

Direct Solar Radiation

The direct use of solar radiation is particularly appropriate to the climatic regimes of many developing countries, but in many areas there is a need for far better meteorological data collection and analysis systems, to assess the potential of this resource.

Flat-plate collectors: The priorities for the use of flat-plate collectors to supply low grade heat in developing countries are: hot water, particularly for process heat; provision of potable water; crop drying and cold storage for agricultural products. The basic difficulty that prevents their more widespread adoption is the cost of construction. Effort is therefore required in the development of low-cost materials, and an improvement of manufacturing techniques, particularly for water heaters which could result in lower construction costs. Larger production would assist in achieving economies of scale. Canadian units are now in service in several developing countries and Canadian sponsored factories in the developing countries have begun production.

Solar heat concentrators are needed to provide a source of high-grade heat that could be used for cooking. Canada is not heavily involved in work on concentrators.

Mechanical power (heat engines): Mechanical shaft power is now available from a number of solar-powered prototype engines. While these engines are satisfactory from a technical point of view, further development work is required to reduce their cost. Mechanical shaft or oscillating power is required for many applications, of which pumping is probably the most important.

Photovoltaic generation of electricity: Prototype generators are now available and undergoing field tests in a number of situations. As with mechanical power, the problem is one of cost, but substantial reductions are expected over the next few years.

Photovoltaic systems are especially appropriate for many developing countries: characteristics such as very low maintenance requirements and suitability for small-scale applications make them uniquely adaptable to rural areas and small village operation. Canada is particularly interested in their applications in communications technology.