

never actually take place as there are physical limitations which dictate a maximum rate of production and there is no crude oil delivery system in Atlantic Canada. Other conventional oil resources are estimated to be

close to four times the level of reserves and are, once again, strongly concentrated in Western and Arctic Canada, notwithstanding recent discoveries on the Grand Banks of Newfoundland.

Table 3-1: CANADIAN LIQUID HYDROCARBON RESERVES AND RESOURCES

| | Volume (millions of cubic metres) ^(a) |
|---|--|
| Conventional Proved Reserves of Crude Oil and Natural Gas Liquids | |
| British Columbia | 32 |
| Alberta | 1,101 |
| Saskatchewan | 119 |
| Manitoba | 6 |
| Eastern Canada | 1 |
| Mainland Territories | 29 |
| TOTAL | 1,288 |
| Unconventional Recoverable Upgraded Oil Resources ^(b) | |
| Lloydminster (heavy oil) | 127-365 |
| Cold Lake <i>in situ</i> (oil sands) | 2,384-4,767 |
| Athabaska Mining (oil sands) | 4,291 |
| Athabaska <i>in situ</i> (oil sands) | 6,356-22,247 |
| TOTAL | 13,158-31,670 |
| Conventional Oil Resources ^(c) | |
| Western Canada | 1,589 |
| Mackenzie-Beaufort | 1,096 |
| Eastern Arctic | 604 |
| Eastern Canada (including offshore areas) | 826 |
| Mainland Territories | 79 |
| TOTAL | 4,194 |

(a) 1 cubic metre = 6.29 barrels.

(b) Range in estimates results from uncertainty regarding the recovery factor attainable using *in situ* recovery technology.

(c) Includes remaining reserves, discovered resources and undiscovered potential at the 50% probability level (1976 estimate).

Source: Canada, Department of Energy, Mines and Resources, 1980b; and Canadian Petroleum Association, 1980.

Canada's largest hydrocarbon resource is found in the heavy oils and tar sands of Western Canada (mostly Alberta) — a resource sufficient, theoretically, to meet our requirements at current rates of consumption for close to 400 years, depending upon how much can be recovered. It is plain, then, that this country need not run short of conventional or synthetic oil for a very long time if political barriers can be overcome and if Canada is prepared to develop resources and pay the costs — economic, social and environmental — of that development. The Committee is of the opinion, however, that these costs are untenable and therefore proposes alternatives which are described in this Report.

Massive development of the oil sands, sufficient to sustain a petroleum-oriented energy system in Canada for decades to come, would entail very high costs indeed. In 1980 dollars, the estimated cost of the next tar sands plant has passed \$10 billion and the impact on Alberta's economy of establishing a series of such plants in rapid succession could be devastating. Shortages in skilled and professional people together with restrictions in the supply of specialized equipment and materials would make it very difficult to construct several plants simultaneously. These facilities also require water in large volumes (which becomes contaminated with bitumen and cannot be returned directly to the Athabasca River), and release significant quantities of sulphur dioxide to the atmosphere in processing the high-sulphur bitumen. Some observers have concluded that the optimal rate of tar sands development would see one new plant coming into operation every four years. Thus the Committee views Canada's oil sands as being an essential but by no means dominant contributor to domestic energy supplies in coming decades.

Despite the extensive resources listed in Table 3-1, it is a matter of record that Canada is not self-sufficient in petroleum. Problems relating to oil prices, capital availability and technological innovation as well as political decisions and lagging exploration successes have contributed to a decline in production in recent years and, as indicated in Figure 3-8, this trend is likely to continue for some time to come. The lower, shaded area in the illustration indicates future crude oil producibility from known reserves (in 1978) of conventional oil and of synthetic oil from the two operating tar sands plants. Actual production is not likely to drop into this region because these reserves are sure to be augmented and because present conditions suggest that we will continue to extract crude oil at a rate near Canada's maximum productive capacity.