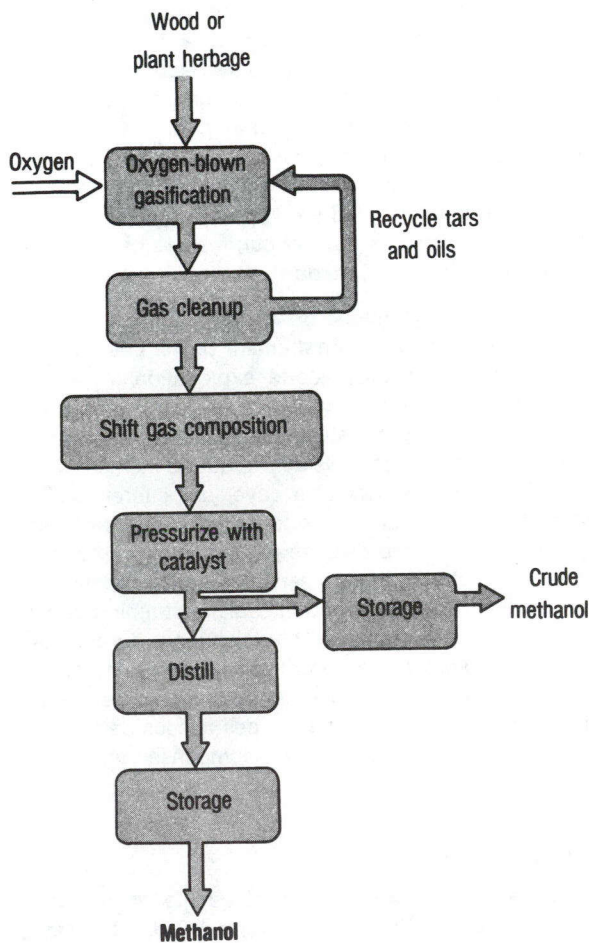


Figure 6-5: PROCESS DIAGRAM FOR METHANOL SYNTHESIS



Source: United States, Office of Technology Assessment, 1980a, p. 95.

severe competition between crops for energy and crops for food if methanol is produced, thus resolving the "food versus fuel" controversy to some extent.

Witnesses before the Committee described a unique Canadian opportunity for development of a methanol industry, incorporating a combined natural gas/biomass primary feedstock. Since the carbon/hydrogen ratio in biomass is higher than ideal for methanol synthesis, significant gains in yield can be made by spiking the synthesis gas with hydrogen. Canada has abundant supplies of natural gas which is a hydrogen carrier, as CH_4 has a high hydrogen to carbon ratio. Therefore combining natural gas with the biomass synthesis gas is essentially spiking it with hydrogen and high yields of methanol can thereby be achieved. High yields translate into reduced production costs and mean that the methanol industry can produce methanol at

costs competitive with gasoline at present world prices for oil.

This technology would allow Canada to use natural gas in the short term to produce some liquid transportation fuel. It would also allow us to exploit biomass for methanol production faster and on a larger scale than by any other route. Methanol could be produced via this hybrid technology within two years, whereas developing a pure biomass-to-methanol technology would require an estimated seven years before commercial production could begin. Not only would yields be high using this hybrid approach, but experimentation with biomass gasification (the last untried step in methanol-from-biomass technology) would allow Canada to develop an expertise which could later be applied in methanol plants based completely on biomass as a carbon source and using pure hydrogen to spike the synthesis gas. This would give Canada a lead in the research, development and commercialization of methanol production from biomass and, when perfected, the expertise and technology could be profitably exported.

CONCLUSION

The Committee concludes there is a great potential for developing a methanol-from-biomass industry in Canada and that this country could become a world leader in methanol technology.

RECOMMENDATION

The Committee recommends that the construction of a hybrid natural gas/biomass methanol plant be encouraged to demonstrate this technology of methanol production as soon as possible.

RECOMMENDATION

Since hybrid natural gas/biomass methanol plants are a transitional step in establishing a fuel methanol industry, the Committee further recommends that such plants be converted when feasible to operation using biomass alone or biomass spiked with electrolytic hydrogen.

It has been suggested to the Committee that one of the major stumbling blocks to the introduction of methanol as an alternative fuel is the fact that Canadian consumers presently have to pay world-level prices for this commodity as a petrochemical feedstock.