

announced its intention of effectively eliminating the use of lead in gasoline by the end of 1992. This follows the trend in the United States where the lead-in-gasoline limit has already been reduced to 0.026 grams per litre. Both methanol and ethanol can serve very well as octane enhancers in replacing lead.

Evidence before the Committee indicates that low-percentage blends of alcohol in gasoline do not create any significant environmental problems. Evaporative emissions may be higher with alcohol-blended gasoline, depending upon the vapour pressure specifications for the resulting fuel, but there are means to reduce such emissions. Exhaust emissions would remain relatively unchanged at the blending concentrations being considered, except for the reduction in lead levels.

Conserving Canada's shrinking reserves of conventional light crude oil provides another rationale for alcohol blending: alcohols can serve as fuel extenders by displacing some of the crude oil required in gasoline production. Methanol is currently manufactured from natural gas, a resource more plentiful in Canada than light crude oil, and could be made from other carbon-rich materials such as coal and wood. Ethanol can be made from ethylene (a chemical produced in petroleum refining), derived from ethane (a constituent of natural gas), or fermented from starch- and sugar-containing feedstocks such as grains and root crops. An experimental process for manufacturing ethanol from cellulosic ("woody" or cellulose-containing) material promises to diversify the potential feedstocks for ethanol production even more.

Alcohol derived from biological materials is promoted by some as a means of substituting a renewable energy resource for petroleum as a vehicle fuel. Care must be taken, however, in examining the energy balance (energy input versus energy output) in producing alcohol because its benefits in this respect may be illusory. For example, ethanol produced at stand-alone plants from crops grown in an energy-intensive agricultural system could consume more energy from nonrenewable sources than would be saved in displacing crude oil in gasoline manufacture and gained in energy credits for the by-products. Coupling an ethanol facility to a methanol plant or to a source of process heat such as a thermal-electric generating station improves the energy balance.

Methanol is in oversupply around the world and selling at depressed prices. Because of limited domestic requirements for this chemical, Canada's three world-scale methanol plants, which represent approximately 10% of global production capacity, must sell 85% of their output in this weak export market. This exposure jeopardizes the Canadian methanol industry. Using methanol as a gasoline blending agent would greatly expand domestic sales and correspondingly reduce the industry's dependence upon a deteriorating international market. It would also enlarge the domestic market for Canadian natural gas producers. The manufacture of methanol currently consumes about 4% of domestic gas output.

Expanded ethanol production using a variety of agricultural materials could also benefit the Canadian agricultural industry, increasing domestic demand as the farm community faces stiff competition selling its produce abroad. Of particular interest, ethanol production provides a market for substandard crops, crop residues and crop surpluses.

The Committee found no serious technical or environmental problems arising from the use of alcohols as blending agents. The fact that various alcohol-gasoline blends are being