

### *Octane Enhancers*

gram. The recent conference on acid rain held in Minett, Ontario, certainly demonstrated these concerns in a most impressive way. I think this is one of the most important issues of our time and our generation. It is we who must solve the environmental pollution problems, while there is still time.

As simple as it may sound, it is the combustion engine that is the major problem resulting in pollutants in our atmosphere. The constant release of vast quantities of nitrous oxides into the atmosphere over extensive regions of the globe has brought us to the critical juncture where we have no choice but to take drastic steps to control air pollution. Over the last several years, there has been a major effort to reduce the lead content in gasolines, both in Canada and the United States, as a major part of this clean-up thrust.

In the United States the Environmental Protection Agency has been the leader in these efforts, even to the point of promoting what are called "lead credits"; that is, federal subsidies to petroleum producers for taking the lead out of their products. It is a program that has been largely successful. Lead as an octane enhancer has been on the way out for the last three years, and with it the injurious effects on the environment and on people. We in Canada have been a little slower in the move to phase out lead in gasoline, but there is a move in that direction.

What about the so-called "lead-free" gasolines? In Canada, lead-free gas is known as MMT, a manganese compound, Mr. Speaker, which is another heavy metal. It is added to gasoline as an octane enhancer. While MMT has a high octane rating, it is highly flammable and can cause irritation to the skin and eyes. High concentrations of it can cause headaches, dizziness, and even unconsciousness.

MMT vapours are known to travel considerable distances to ignition sources and cause a flashback. The hazards of MMT to people and to the environment are therefore obvious. In the United States, MMT has been effectively prohibited since 1977 because of federal regulations which only permit a quantity of 0.0685 grams per gallon to be used in any gasoline blend. MMT is also prohibited in Europe. So, it has to go also in Canada, and as soon as possible.

The removal of lead and of MMT from gasoline as octane enhancers leads naturally to the question of their replacement. Where do we go to find a replacement source? What are the global aspects, economically, of such a possible replacement? My motion answers these questions. When Canada meets U.S. and, indeed, world standards for lead and MMT concentrations, something else must supply the needed octane enhancement. Clean-burning alcohols are ideally suited for this purpose. My motion proposes the federally-sponsored production of an ethanol-methanol blended gasoline for Canada, known as EM gasoline.

A blend of 92 per cent gasoline, 5 per cent methanol and 3 per cent ethanol creates a satisfactory octane requirement. Again, that is a blend of 92 per cent gasoline, 5 per cent methanol—sometimes known as wood alcohol—and 3 per cent ethanol—and that is the happy stuff, Mr. Speaker. The combination of the alcohols making up 8 per cent of the fuel

will cost no more than the gasoline it replaces, and maybe less, and these alcohols will not damage the environment.

Both methanol and ethanol are home-grown products. Methanol is derived from methane, or natural gas, of which Canada has an abundant supply, and ethanol is a renewable fuel alcohol produced from grains, particularly grain corn, though it can also be produced from cull potatoes, from the east, or forestry by-products in the West.

Let us get right into the cost factors of this EM concept of octane enhancement. The idea of alcohol for this purpose has been around for a number of years, usually in the form of a straight 10 per cent ethanol blend with gasoline, which is known as gasohol, a product used commonly in the United States. It has gained the reputation of being unable to quite compete with petroleum-based fuels, but in Canada, we have natural gas and lots of it. With it we can produce methanol for nearly one-half the cost of gasoline. It can be produced at 16 cents to 18 cents per litre while the cost of producing gasoline is about 31 cents per litre. Methanol is the key to introducing clean-burning, affordable alcohols into our gasoline blends.

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There are three modern western plants already producing methanol. One such plant is Alberta Gas Chemical Co. at Medicine Hat, Alberta. The two others are Canadian Celanese in Edmonton and Kitimat, British Columbia. These factories were built during the heyday of export markets. Presently, the domestic market is quite small. I am told by reliable sources that if these plants were put into high gear, they could produce enough methanol for all the gasoline blend requirements in Canada. No megaprojects need be considered, just efficient, job-creating, production increases with natural gas as a source.

I am sure Hon. Members are asking themselves at this point why we need ethanol if methanol can be produced far cheaper. Today's cost of producing ethanol is, I believe, about 50 cents per litre. Methanol requires a co-solvent to keep it properly mixed in gasoline, particularly in cold weather. Ethanol is a co-solvent that will do the job. There are other co-solvents such as isobutyl alcohol and isopropanol, both derived from petrochemical feed stock. However, ethanol comes from a renewable source and it is now unmistakably clear that the price of petroleum and petrochemical products, regardless of technological advances in the field, can only go in one direction and that is up.

Since 1977, petrochemical products have shown a continuous price increase and it is the opinion of the economists, based on long-term supply and demand situations, that the cost of petrochemical resources versus renewable resources will meet at a certain point. I have a graph which shows absolutely and inevitably that the costs will meet and even forecasts the meeting point to occur some time in 1991. Right now, though, ethanol does cost more to produce than gasoline.

The success story of gasohol in the U.S., where five billion U.S. gallons of blended gasoline consisting of 10 per cent ethanol and 90 per cent gasoline are sold annually, means that its production is supported by federal and state incentives. This