

Still 40 years away

Fusion: cleaner and safer energy

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convey the energy to the mixture so rapidly that the fusion takes place before any material can escape; use laser or ion beams to convey the energy to a fuel pellet thereby initiating fusion.

The great interest in fusion over fission for the generation of electricity is the result of the following advantages. The environmental attraction is that the tritium fuel is much "cleaner" than uranium, much less is used, and waste products are stable and non-volatile.

Fusion is safer since there is no after-heat, hence no reactor meltdown because large amounts of energy are required for sustaining the reaction and no runaway reaction is possible.

There is also an abundance of fuel. Deuterium is obtained from seawater and tritium is bred from relatively abundant lithium. There is also a strong potential for the direct conversion of the fusion reaction to electricity with efficiencies up to 90 per cent. Although the leaders of fusion research are the U.S., Europe, Japan and U.S.S.R., Hydro-Quebec has a modest research program centred at Varennes Quebec (near Montreal) and NRC is conducting research in Ottawa.

The major problem in the fusion technique is the amount of energy that is put out by a reactor. An energy break even situation is expected by 1983 with a test reactor being constructed by 1990. A demonstration model reactor is expected by the year 2000 and a commercial reactor is slated for 2010-2015. An additional problem indicated for Canada is the lack of

technical personnel skilled in lasers, plasmas and electronics.

Energy Policy: Expenditures related to research on alternate fuels.

Larry Grossman, Ontario's Minister of Industry and Tourism presented a talk on Ontario's Energy Research and Development Policy at the conference luncheon. Responding to "cut-back" protests from a group of perturbed students, Grossman indicated that tuition increases are well below the inflation rate. He went on to explain Ontario's future research strategy which includes energy and technology as the cornerstones. Emphasis was placed on innovation, technological growth, industrial expansion, increased funding to joint university and industrial projects, increased development of the CANDU reactor and increased expenditures related to research on alternate fuels such as propane, alcohol and hydrogen.

Solar Energy and Other Sources: "The Star of the 21st century."

A lively presentation entitled "Solar Energy, The Star of the 21st Century" was given by Dr. G. Gross, Chief of Materials Research Branch Solar Energy Research Institute of Golden, Colorado.

Gross wondered, "Why should we have the right to feel that we're special and not go the way of the dinosaurs?"

He said that ultimately there is only one energy source which the planet can live with for a long time: the sun. According to Gross, in the 21st century the majority of homes will need to be solar dependent.

Wind should also be able to supply a significant amount of energy. This is now nearly commercially viable.

Ocean thermal energy was presented as another resource, although problems of location, corrosion and ocean plant life are proving to be formidable barriers to this energy supply.

Solar thermal power generating stations are also a future possibility, however there are basic difficulties: the silver on mirror surfaces deteriorates rapidly in the open atmosphere.

Gross predicted that there will be rapid developments in photovoltaic cells made from copper sulfide and cadmium selenide.

These are produced in very thin

layers similar to the gold coated glass new buildings. It is expected that solar cells will be in wide use by the beginning of the 21st century. Additional energy savings may be related to Biomass, which could produce cheap fuel sources such as hydrogen, or alcohol as a result of genetically engineered bacteria. Alcohols may also be easily and inexpensively separated using polymer filters. Bacteria could be used to grow hydrocarbons (oil) in very short periods of time. There are numerous energy projects now being researched and the prospects are exciting and optimistic.

Conservation: Costs in providing necessary energy are sobering.

Ian Rowe, Ontario's Assistant Deputy Minister of Conservation and Renewable Energy emphasized the importance of conserva-

tion in the final presentation of the conference. "Forty-six per cent of Ontario's energy usage is lost in the atmosphere and is unrecoverable," he said.

The main cost is in the transportation sector and the big issue for the next century will be continuing to provide mobility for the individual while maintaining a high degree of efficiency.

The energy conference provided an optimistic attitude for the Energy Crisis syndrome that has inundated our culture for the past several years, but the costs that will be incurred in providing the necessary energy are sobering.

Millions of dollars must be invested to attain energy independence. As individuals we should be prepared to increase our productivity as our energy needs grow and be conscious of the need to conserve. We are in a crisis situation but the future is not bleak.

Quickies

WHERE IS POETRY IN ACADEMIC THOUGHT?

WHERE IS CREATIVITY?

WHERE IS THE INTUITIVE LEAP?



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