

The North American North (2)

# Money or energy problem?

Jeff Carruthers in Ottawa examines the most expensive private capital project ever undertaken, the AlCan gas pipeline

CANADA and the United States have together decided to build an all-new gas transmission system to carry Alaskan natural gas more than 5,000 miles to markets in North America's industrial heartlands in the North and West. The planned pipeline can be described in many ways, all of them large. The cost alone will be at least \$10,000 million. Ultimately the system might also transport smaller gas reserves from Canada's nearby petroleum fields in the Mackenzie Delta and Beaufort Sea region of the western Canadian Arctic, to its own consumers in central and eastern Canada.

From a financial perspective, the Alaska Highway pipeline project is almost certainly the most expensive private capital project ever undertaken. Economists and bankers generally agree that financing could stretch Canadian and American money markets to their limit, especially if the inflation and cost over-runs that have plagued other recent North American energy projects (such as the trans-Alaska oil pipeline and the mammoth James Bay hydroelectric project) push costs for the Alaska Highway project to the \$15,000 million or \$20,000 million that some experts fear.

From a technical viewpoint, the problems to be encountered in the northernmost areas in Alaska and the Canadian Yukon Territory are considerable, but at the same time not regarded as insoluble. The key issue is whether they can be resolved within the time and cost parameters agreed to by the two governments. A frigid and dark climate prevails during the winter construction months. Gravel and water are difficult to find in places for construction. The permafrost, where materials hard as rock in below-zero temperatures can turn to soup if thawed, and where a phenomenon called 'frost heave' can literally lift a pipeline out of the ground if it is intentionally chilled through water-rich permafrost soils, presents its own problems. And an ecology that in many places is poorly understood needs protecting.

Economically speaking, Canada regards the pipeline project almost as a godsend, calculating that it could provide upwards of 100,000 man-years of direct and indirect employment for an economy facing rising unemployment, a worsening balance of trade and a damaging rate of inflation. In fact the

project is widely regarded as much as a make-work scheme as a vital (if costly) way of developing urgently-needed energy supplies.

## Energy initiative

Yet it is the energy initiative inherent in the pipeline project which puts the Alaska Highway cooperative venture into its proper perspective. For \$10,000 million the United States hopes to connect gas reserves of 22–24 trillion cubic feet (TCF) in Alaska's Prudhoe Bay oil fields to markets in the lower 48 states. Assuming all of that gas is available—and there is some controversy about this already, based on fears that extraction of the gas could lower the recovery of associated (and more vital) crude oil—it would be sufficient to fill one year of current US gas demand.

Canada, which is hoping the pipeline can be connected later to some 5.2 TCF of gas in the Mackenzie Delta, would be able to fill two years of its current demand with its northern gas from the Delta. Ironically, perhaps, Canada is slated to export more natural gas from already-connected fields in southern Canada to the United States during the next decade than it hopes to connect in the western Arctic—and this is gas costing considerably less than Alaskan and Delta gas (the best estimates at present are that the Alaska Highway pipeline will deliver northern gas to southern markets for between \$3 and \$4 a thousand cubic feet, assuming no major cost over-runs for the pipeline project).

Critics of the pipeline include church groups, energy conservation groups, and environmentalists and northern native groups. They have argued that Canada and the United States do not really need the extra gas and that the adoption of adequate energy conservation techniques nationally could probably do more good for the state of the two nations' energy than any mammoth project. They have managed to focus national attention on a stark reality: that replacement energy for wasted existing energy resources in Canada is costing so much to develop on a per unit basis that even supposedly resource-rich countries like Canada cannot continue to rely on the non-renewable fossil fuels indefinitely.

If anything, the Alaska Highway pipeline underlines the growing belief that the availability of money is rapidly becoming more critical than the avail-



British Petroleum

Building the trans-Alaska oil pipeline

ability of new energy resources, especially as the new resources grow more and more remote either geographically, as with Arctic gas and oil, or technologically, as with Canada's vast oil sands deposits.

## Two competitors

This relatively new concern about finance, which ultimately translates into energy costs to consumers, was one of the key factors in the two governments' selection of the Alaska Highway project over two competing gas transmission projects.

One rival consortium had proposed a pipeline from the oil and gas fields across the environmentally-sensitive North Slope (with the Alaska Wildlife range) to the Mackenzie River Delta, then up the Mackenzie River valley in the Northwest Territories to the province of Alberta, and then into the United States and central Canada. This proposal, by Canadian Arctic Gas Pipelines Ltd, a US-dominated consortium, was rejected in Canada on socio-economic and environmental grounds, even though it was believed to be technically superior to the Alaska Highway project. Approval of the project would have meant opening up the relatively lush Mackenzie Valley and would have risked confrontation with militant native groups, which are still trying to settle aboriginal claims with the Canadian government for much of the area.

The Arctic Gas project, as it was called, was the front-runner until a few months before the final government decision. A historic northern inquiry by a provincial Supreme Court judge, Thomas Berger, had been launched by the government to study the impact of such a development on the North generally and on the Mackenzie Valley specifically. Berger's report dealt a death blow to the Arctic Gas project when it suggested that the native way

of life for northern Eskimos and Indians would be ruined should the pipeline proceed within the decade. Berger looked more favourably on the Alaska Highway project, in part because a highway to Alaska had already disrupted that part of the North and because the natives were already more integrated into a southern style of life.

Other factors helped to kill the Arctic Gas project. The small Canadian gas reserves in the western Arctic, for example, did not justify an immediate Canadian commitment to a joint pipeline with the United States (the Alaska Highway project, by contrast is intended initially to serve only the United States). Arctic Gas also said it needed government guarantees to be able to finance its slightly-larger project—guarantees neither government was willing to provide. In addition, 'frost heave' and winter construction problems were more severe along the Mackenzie Valley route (the consortium would have had to provide 24-hour-a-day artificial lighting and artificial snow to construct the most northerly portions). Finally, the Arctic Gas project probably wouldn't have been Canadian controlled.

In the last analysis, the Arctic Gas project was an engineering and technical solution, based also on geological prospects along the route. But it failed to be sufficiently flexible to cope with non-technical matters, including its impact on native northerners, on Caribou herds, and on the ecology of a major river valley and a delta in the Arctic—not to mention political matters such as Canadian nationalism. To add further to the irony, the Arctic Gas proposal was studied to a much greater extent than the Alaska Highway project, so that more of the problems associated with it were known and widely publicised by its opponents in the media and before regulatory

review bodies.

Another petroleum industry consortium, preparing officially to propose the construction of an even longer and more technically difficult gas pipeline from the High Arctic of Canada (Melville Island initially) to southern markets, is keenly aware of this danger of being too prepared. The Polar Gas consortium, as it is called, is proposing a step-by-step government review in which the broad economic, social and environmental issues are dealt with first, preferably to produce some sort of initial government approval. Then more studies would be done and more money spent on the technical aspects of getting a 42-inch gas pipeline safely to the mainland, across marine trenches tens of miles wide and as much as 1,500 feet deep. The Polar Gas project is expected to cost even more than the Alaska Highway project, and to tap 10 to 15 TCF of gas for Canadian and possibly American markets.

### Second project

The other project defeated by the Alaska Highway pipeline was the El Paso scheme to transport the Alaskan gas in liquified form by tankers to the west coast. The US government decided that a pipeline across Canada was more economical and involved less risk because a well-proven technology was being used. Since that decision earlier this year a number of Canadian companies (including PetroCanada, the national petroleum company, and Alberta Gas Trunk Line Company Ltd of Calgary, one of the two founders of the Alaska Highway pipeline consortium in Canada) have been studying the feasibility of using special ice-strengthened liquified natural gas tankers to transport High Arctic Islands gas from Melville Island to markets along the eastern seaboard. The project, if it is ever pursued, will initially move only 250,000 cubic feet a day, compared to more than 2,000 million cubic feet a day to be moved along the Alaska Highway pipeline starting in 1983.

In allowing the Alaska Highway pipeline to cross Canada, the Canadian government has insisted that the Canadian portions be Canadian controlled and has accepted the promises by private industry (the Foothills Pipelines Ltd consortium) that Canadian content in the Canadian portions would exceed 90% for goods and services. The government is assuming that in a few years the go-ahead will also be given to a lateral pipeline to the Mackenzie Delta, and space has been reserved in the pipeline for this Canadian gas.

The US government has even agreed to have its gas consumers pay for a

substantial portion of the lateral pipeline to the Mackenzie Delta, on the condition that cost over-runs in the Canadian sections of the main pipeline are kept below 35%. As a further incentive to keep costs under control, and with the nightmare cost over-runs associated with the TransAlaska oil pipeline still fresh in mind, the two governments plan to tie approved return on equity for the private participants to the success in minimising costs.

The US Congress has recently given legislative approval for the project. Legislation should be introduced in the Canadian parliament before the end of the year which will also establish a single monitoring agency to ensure that environmental and native impact is minimised and to ensure that safety standards are met.

Finance is the next major hurdle, with \$8,100 million due to be raised in US capital markets and \$1,700 million in Canada. The first official attempts at financing should take place late next year. And should private financing in North America fail, the pipeline consortium is expected to seek government assistance in Washington and Ottawa before trying to tap European and other foreign money markets.

The pipeline project promises major business and major technological challenges for many key industries in Canada and the United States—steel, construction equipment, valves and turbine compressors, ditchers and welding machines, engineering and consulting services. It should therefore come as no surprise that the Canadian government hopes to use the Alaska Highway project as a lever for convincing more foreign companies to start working and manufacturing in Canada, using more Canadian talent instead of just Canadian raw resources.

On the planning boards in government offices, the Alaska Highway project is only one of a long list of expensive and increasingly technically difficult energy projects, including tidal power, oil sands extraction plants, heavy oil extraction and up-grading plants, more northern gas pipelines, LNG tanker transportation schemes, nuclear power (using the CANDU system developed in Canada), hydroelectric developments (including the use of DC transmission for long-distance power movement), offshore exploration, and coal gasification plants.

As with the Alaska Highway pipeline, the uncertainty surrounding these projects relates more to the availability of financing than of technical expertise. And the Canadian government says it is willing to invest in equity in such projects if necessary, if only to make sure the money is available. □

