

"Simple and Robust" **for Village Energy**

With the price of fuel oil in village Alaska soaring to \$2.00 and more a gallon, you begin to hear village people talking about having to go back to seal oil for their lighting and heating needs.

That's not really so far off the mark, according to Goesta Bursell of the Danish and Alaskan firm of Polarconsult. Bursell, in his address to the Alas-Can Energy Expo '80 in Anchorage, said the people of rural Alaska will be facing real hardship if both the price of fuel oil and their dependence on it continue to increase.

"It must be good news for them," he said, "that the Alaska Power Authority now has called for a reconnaissance study of 29 villages throughout the problem areas. It will be the most interesting to learn the results from this ongoing study."

The energy problems of rural Alaska, he said in a subsequent interview, are not really so different from those of Denmark, where all gas and oil has to be imported, and where the price of those commodities range from \$3.50 to \$4.00 a gallon and rising.

The evaluation of village energy alternatives will have to consider each village, separately. Wood may be logical for a village in Southeast Alaska or along a coast thick with driftwood, while wind generation makes sense in the blustery Aleutian Islands. On the other hand, coal seems more sensible at a place like Cape Lisburne, where coal occurs in seams which were mined way back in the days of the Nantucket whaling fleet. Geothermal hot springs occur in some locations. What is involved is an inventory of the local village and its resources.

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A whole range of alternatives exist, he said. They can be broadly classified as non-renewable, such as natural gas, coal, and methanol produced from coal; semi-renewable, such as wood and peat; and renewable, such as small-scale hydro power, wind, geothermal, bio-gas (from organic wastes) and solar energy.

Some of the sources sound like something out of a Jules Verne science-fiction story of the early 1900's. One was described as "another form of geothermal energy...represented by the difference between normal soil temperature and the air temperature above ground. The source of energy is now being increasingly put to use in Denmark by using heat-pumps, as a supplement to the main energy supply for residential and other buildings." However, he said, "Since this system relies on heat-transmission in the ground, it does not have real application in permafrost conditions, where ice would act as an insulator."

An important thing to bear in mind in working with village Alaska conditions is the technology level of the proposed energy alternative. High technology systems require training of an operator, and often take persons away from important subsistence activities — or the other way around, he pointed out. "For this reason, the ideal village energy system should be simple and robust," according to Bursell.

Mr. Bursell concludes that the most practical sources in the overall picture for rural Alaska are wind and coal, though there will be many local variations from this norm.

Village energy needs differ from those in urban areas throughout the United States in one important particular. That is the ratio of energy needs for heat compared to energy used for light and other power needs. In rural Alaska the heating energy needs can account for up to 93% of the total energy requirement.

Polarconsult has formed a joint venture with Arctic Slope Regional Corporation and several other firms, called Arctic Slope Technical Services. Polarconsult Alaska, Inc. is an Alaska-incorporated firm.