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Rogel, Rufino O.

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By

Rufino O Rogel

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ASEAN'S QUEST FOR ALTERNATIVE ENERGY SOURCES

by Rufino O. Rogel

The oil shock of the '70s which fueled worldwide interest in the need to develop alternative energy sources could be considered as a blessing in disguise to member-countries of the Association of Southeast Asian Nations (ASEAN).

Apart from Singapore, the four other ASEAN nations - Indonesia, Malaysia, Philippines and Thailand - are blessed with bountiful natural resources which, if truly tapped, can be adequate to meet their energy needs.

No less than the economic committee of ASCOPE (ASEAN Council on Petroleum) noted that ASEAN members are undertaking measures to reduce their dependence on oil by developing alternate sources of energy like coal, hydropower, geothermal and natural gas.

The committee observed that the ASESAN member-countries had to undertake such measures due to the difficulties that "they have experienced because of rapidly rising oil prices and the awareness of their vulnerabiliy due to their dependence of imported oil".

Despite the fact that Indonesia and Malaysia are net exporters of crude oil, the region as a whole is heavily dependent on oil imports because of the mismatch between the crudes that nature has endowed it, with the petroleum products it needs.

Data compiled by the ASCOPE economic committee showed that Indonesia depends on oil to provide up to 77 percent of its energy needs; Malaysia, 94 percent; Philippines, 87 percent; Singapore, 100 percent; and Thailand 82 percent.

Because of this mismatch, the committee noted that there is in fact very little intra-ASEAN trade in crude oil.

But knowing that the region is blessed with bountiful alternative energy resources, the application and the development of coal potential and other prospective energy resources like hydropower and geothermal went into high gear.

Indonesia, for example, which has a coal reserve of about 18 billion tons is embarking on a program to reduce its dependence on oil by diversifying into coal for its power generation requirements.

The comodity is projected to be the main force behind the country's electricity expansion program until the mid-1980s, aside from providing cheaper fuel for high power consuming industries like cement factories.

In the field of hydropower generation, Indonesia has an abundant source which is considered as the largest in the region, but only about 2.1 percent of its potential is on stream,

Under its energy program (Replita 111), Indonesia envisages to increase its current usage of 650 megawatts (MW) by another 275MW and increase it further to 2,140 MW by the end of the decade.

For geothermal, prospects for exploiting it are extremely good since Indonesia has 138 active volcanoes in the geothermal strip measuring 1,700 kilometers long and 200 kilo meters wide.

The first step to tap this type of alternative sources of energy was carried out by Pertamina in 1974 in Dieng, Central Java and in Kamojang, West Java they are the most potentially attractive areas for tapping hot steam coming from the bowels of the earth for energy generation.

The combined efforts of Pertamina and PLN, the state electric company, other government agencies and the technical assistance extended by Geothermal Energy-New Zealand Ltd. paid off.

The search culminated in the completion in 1978 of a small geothermal electric power plant of 250KVA at Kamojang, the first of its kind in Indonesia.

For Malaysia, its thrust of energy diversification is basically anchored on how to fully exploit its hydropower potential which has a current power generation capacity of 606 MW.

Plans are afoot to increase its hydro-electric power generation capacity to 1,198 MW by 1985 by commissioning three major hydro-power stations and to develop mini-hydro stations to complement the country's rural electrification program.

Another major move to reduce its enormous dependence on oil is its plan to use its natural gas which has a proven reserves larger than that of oil for power generation and later on for transport.

ASCOPE records showed that plans to land gas from fields offshore Peninsular Malaysia are being finalised. It calls for a 450MW combined-cycle power station in the vicinity of Paka, Trengganu.

The power station to be constructed by the National Electricity Board would principally be used for power generation.

It is interesting to note that natural gas is being used by the Sarawak Electricity Supply Corp. to generate electricity while the Miri PWD is supplying gas for industrial and household use in that town.

With regards to coal, prospects of using it as a source of energy are rather limited considering that Malaysia has limited reserves, principally located in Sarawak.

For the Philippines, the country is particularly optimistic about coal and geothermal programs, which jointly could double their contribution and meet about 26 percent of the country's energy requirements by 1987.

The geothermal program envisages increasing steam availability to some 3,000 MW by 1987 with the development of 14 fields and drilling of about 560 wells.

In terms of electric power generation, installed capacity would increase to about 1,554 MW, displacing the equivalent of 14 million barrels of oil per year.

Current exploration and development efforts are pioneered by Union Oil of California, USA which developed the geyser fields and the state-owned Philippine National Oil Company (PNOC).

The latest entry is Caltex and more private sector participation is expected following the set of attractive policies and incentives enunciated recently by the government.

The geothermal pricing policy, for instance, would allow investors an 18 percent return on investment without mentioning the fact that the market is assured since the state-run National Power Corporation will buy the steam for its power generators.

With regards to coal, the coiuntry's reserves are virtually intact since there are few users of the commodity and lack of facilities for inter-island, railway or conveyor transport.

At any rate, coal output is expected to increase and hit the 4.2 million-metric ton level by 1987 with the accelerated development of some 50 mines by local and foreign contractors.

To develop a tangible market, the government is assisting the cement industry, for a start, to convert their oil-fired machineries to coal.

The country's program for developing alternative sources of energy also calls for harnessing abundant domestic resources such as biomass, solar, wind and agri-wastes such as bagasse, the largest traditional resource.

Bagasse is the dried stem of sugarcase which is burned as fuel for sugar refineries and alcohol distilleries.

According to the ministry of energy, bagasse usage displaced the equivalent of more than five million barrels of imported oil in 1982 alone.

In Thailand, efforts have been made to reduce its reliance on oil imports by developing alternative domestic energy resources like coal/lignite, oil shale and radioactive minerals.

The country's fourth and fifth development plans set a target to increase the use of lignite for power generation from the current 1.4 million tons a year to 5.5 million tons by 1986 and for industries to increase usage four folds up to one million MT per year.

A large deposit of oil shale with a total reserve of approximately 18,000 tons oil which is equivalent to around 6,000 millions barrels of crude oil can be foiund in the northern province of Tak.

A laminated marlstone rock, oil shale contains kerogen, an organic material that releases vapors convertable to raw shale oil when heated to temperatures between 430 and 542 degrees celcius.

Raw shale oil is a black viscous substance that can be refined into petroleum products through a highly sophisticated technology needing a huge amount of capital investment.

Uranium, a radioactive mineral, can also be found in the northeast province of Khon Kaen and an extensive study and survey is currently being undertaken.

The non-oil development program of Asean countries are justifiably ambitious but it would take a long time before it could change to a large extent the region's existing energy mix.

At any rate, a big step has been made towards developing alternative sources of energy. The initial impact is now being felt, particularly in the Philippines which used to be heavily dependent on imported oil.

Statistics compiled by the Philippines Ministry of Energy showed that for 1982 alone, the displacement of imported oil by local energy sources resulted in savings of US$918 million, poushing the coiuntry's degree of energy self reliance from 22 percent in 1981 to 32 percent last year.

With this development, it is not far-featched that the country would be able to achieve the 1986 target of 50 percent self-reliance even without additional new construction because of the numerous projects already in the implementation pipeline.

No less than the World Bank, in citing the country's formulation and implementation of a comprehensive program as one of the models for the Third World is optimistic that the Philippines "will be in a much better position, energy-wise, that would otherwise be the case" by 1989.