

The Strategy for the Energy Sector

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THE OBJECTIVE OF the paper is to review critically the recommendations made by the Advisory Board on Energy on Medium Term Strategy for the energy Sector meant for adoption during the 7th Plan. The paper considers the approach of the Advisory Board on energy and some of the specific programmes recommended by the Board.

Approach of the Energy Advisory Board

The approach of the Advisory Board on Energy to a Medium term Strategy for the energy calls for initiation of a process for substitution of non-renewable sources of energy by renewable sources, as a part of the long term strategy for eventual transition to an economy based on renewable energy. It points out in the medium term strategy the need for according priority to meet the household demand for energy in the rural areas through intensive afforestation programme. The Advisory Board suggests that there should be a policy for management of demand for energy so that the overall energy-intensity of the economy is reduced, the efficiency of energy-utilization is increased and a substitution between fuels takes place encouraging a shift away from hydrocarbon to coal. It urges paying more attention to the location of energy demand, particularly of energy-intensive industries and power stations to achieve efficiency and economy in transportation, another energy intensive sector.

The Advisory Board admits of the need for a long term perspective in energy planning. The transitional period however should be utilized to enable the economy to shift from the dependence on oil to natural gas and coal and to renewable sources of energy in the long term. The Seventh Plan should aim at

implementation of the medium term strategy.

The long term strategy spelt out by the Advisory Board on Energy merits serious consideration of the policy makers and the public at large. It befits the conditions availing in an economy like India. However the success the country can expect to achieve in this direction will depend largely on the path chosen in the intervening period of transition. The Advisory Board has made a number of specific recommendations for implementation during the medium term. We intend to subject some of them to scrutiny in the light of the objectives set forth.

Social Forestry

The major objective of social forestry is to extend the base for firewood and small timber needs of households to relieve pressure on the existing forest areas. The Forest Departments in the various States have launched an ambitious programme for providing assistance to the farmers to plant trees on their fallow lands. The loss in forest cover can however be partially explained by the use of fuel-wood for domestic cooking. A substantial part of the forest products in the form of timber poles, pulp for paper etc., is utilised for commercial purposes by the organised sector. The approach of social forestry may not be able to reduce the draft on forest resources for fuel-wood. It has been observed that the villagers have been taking to planting of trees with an expectation that the product will be purchased by the organised industries like paper and pulp manufacturers. The interest aroused for planting of Eucalyptus trees is largely because of such a motive. The chances are that the villagers will continue to exploit forest resources for meeting their requirements of fuelwood for cooking while nurturing trees planted by them for selling to the industries.

It may also be noted that the social forestry is largely concentrated around the forest areas only, primarily because the programme is organized by the Forest Department whose officials are based in the reserve and protected forests. This leaves a vast acreage of fallow and uncultivable areas lying in regions

distant from the reserve or protected forests, outside the scope of the afforestation programme.

A different approach is being followed in respect of village woodlots where land held under the local authorities e.g. village panchayats, are being developed for providing fuelwoods for villagers exclusively. The extent of such land is however not very large.

The cooking energy policy should comprise of introduction of more efficient chullahas, bio-gas units for households and greater use of smokeless fuels in urban and semi-urban areas. The role of demand management in protecting forest is not adequately appreciated. An appropriate pricing policy could encourage use of soft coke in the urban and semi-urban areas. It may be necessary to follow a policy for gradual reduction in subsidy on kerosene with a corresponding increase of subsidy on soft coke. A complementary approach in social forestry could be adopted in areas adjacent to settlements where coal could be easily reached by transport. Afforestation programme may be possible in such areas.

A pricing policy favouring substitution of timber and other woods for construction, railways and furniture building activities by products of steel and RCC materials would be helpful. To the extent the Board and Pillar method in mining is replaced by advanced technologies like Longwall method or open cast method of mining is adopted the demand for wood would diminish.

The suggestion of the Advisory Board that industries using wood should be required to regenerate the wood it consumes is interesting. However, there has to be a balance between the demand for the products of such industries and the availability of areas for regeneration of wood. It is the imbalance between the two that has caused denudation of forests in Europe. Some of the Western countries have been sponsoring schemes for afforestation in the tropical countries to meet the deficit in their needs for the industries. The results have not been all too beneficial for the supplier countries.

Biomass

The Advisory Board has rightly

pointed out that there has been little effort to select or develop through genetic breeding a right type of plant for afforestation in Indian conditions. Both the species of plants, *Eucalyptus* and *Leucaena leucocephala* or Subabul, are exotic ones. The deficiencies of *Eucalyptus* have been commented upon widely. Subabul is yet to take roots in different parts of the country. It appears that ready availability of the exotic variety of species has proved a hindrance to the development of an indigenous variety better suited to local conditions. Another area with special kind of biomass can be developed to substitute for hydrocarbon based chemicals is related to agriculture. Extensive culture of blue-green algae by the farmers can be induced for their eventual use in agriculture to raise productivity without too much dependence on chemical fertilizers. Some of the species like water hyacinth is now being used by farmer for making compost. Town sewage is also used both in pisciculture and agriculture as fertilizer. The spontaneous efforts of individuals need be supplemented by organized efforts to improve the efficiency and the rate of utilization of these energy resources.

Biogas

It may be possible to induce households with reasonable number of cattle-heads living around the forest areas to take to biogas units for meeting their fuel requirement. This will be contributing to a reduction in the demand for fire-wood from the forest. An appropriate scheme for subsidising the biogas units in such areas may be considered.

Secondly, dairy farms, both in the private and public sectors may be encouraged to instal large-sized biogas units which would meet their requirement for lighting and plants for refrigeration of milk. Dairy farms in the Government sector can demonstrate the feasibility for utilization of biogas energy for running of tubewells and refrigeration plants.

Power

Development of hydel capacities is essential for achieving optimal utilization of thermal capacities in the country. As the level of generation by the thermal plants cannot be varied by a large measure within

a short period, there is always a problem of maintaining balance between off-peak and peak period generation by the thermal plants. Integration of operation of the thermal plants with the hydel power plants permits such a flexibility in operations. The position is particularly difficult in the eastern region where there is a large concentration of thermal power plants without adequate backing from hydel plants. Fortunately, however, the north-east region possesses the maximum potential for hydel resources in the country which could link with thermal power plants in the eastern region if the former properly developed. The utilization of hydel potential in the north east region is presently the lowest in the country.

The conflict between agricultural sector and the non-agricultural sector in respect of the demand for power is likely to grow more acute with the development of agricultural load. Experiments are being made in some areas to examine how far the agricultural load could be shifted during night time when uninterrupted power supply can be assured.

The concept of regional grid with inter-regional tie-lines has been progressing rather slow and has not been gaining ground in the country. The major difficulty about inter-connected grid system arises from inadequacy of power capacity for distribution between the regions. It is conceivable that national grid would be welcomed when there is sufficient capacity to meet the deficits of all the regions.

The policy for developing a national grid will be strengthened to the extent the Central power organisations are capable of installing power plants with large capacities which are presently beyond the means of the State Electricity Boards. Setting up of Central organizations like NTPC, NHPC and NEECO are in the right direction. However these organizations have to be allocated sufficient resources so that their capabilities are fully utilized during the Seventh Plan. The policy for setting up of coal handling plants, coal blending plants, and washeries at the coal mines has to be pursued vigorously. The response of Coal India towards

such ventures has been less than adequate presumably for lack of resources.

Rural electrification

Extension of electricity in the rural areas involve laying of lengthy distribution lines for serving a relatively small number of population settled in disperse areas. It can be appreciated that only a small section of the rural households would be capable of meeting the rate for electricity if it is charged on full-cost basis. As a consequence the tariff for electricity has to be set at a level lower than actual cost to induce households to accept electricity. A conflict between the objectives for attaining viability by a State Electricity Board and extension of electricity in the rural areas is therefore inherent. Subsidies granted by the States can only partially compensate for the rural electrification schemes. One can expect that the conflict will resolve eventually with the improvement in the levels of living of the rural population. In the meantime extension of rural electrification has to be pursued through cross-subsidization for consumption of energy in rural areas in the domestic and agricultural sector by charging higher rates for industrial use of electricity. The farmers interested in using pump sets for agriculture are, however, capable of paying reasonable charges for electricity. This is evidenced by the extensive use of diesel pump sets, which costs more than electricity, in areas not served by electricity. But substitution of diesel pump would not be possible only when there is an assurance of uninterrupted supply of electricity.

It is not often realized that socio-economic factors have a major role, no less than the technical ones, in the programme for rural electrification. Whether it is in the selection of areas for electrification, or prevention of rampant theft of line materials and equipments, or organization of cooperatives for servicing of electricity, motivation of population at the grass roots level is an essential pre-condition for a viable programme for rural electrification. This aspect of the programme has not received attention due to it.

Solar Energy

Solar energy is now taken to be

an important element in the strategy for exploitation of the renewable resources. It is expected to provide a major support to the decentralized pattern of development of energy resources. Some of the problems that may arise from exclusive consideration of solar energy as a means to serve remote areas, deserve attention. The non-conventional sources of energy like solar, wind or micro-hydel units share one characteristic in common. They are not capable of providing continuous supply of energy over all seasons in any year. It would be necessary to consider them in a mix of alternative sources of energy where continuity of supply is required to be maintained. In remote areas it may even be necessary to back these up with diesel generators. It should also be possible to link up the energy supply from the non-conventional sources with the grid supply wherever found suitable. Once the cost of photovoltaic cells comes down to a reasonable level through research and development activities it is bound to find wide acceptance even in areas served through the general grid for power supply.

The solar cookers may be found useful for substituting firewood. The solar cookers can also be distributed among households around forest areas to relieve the pressure on the forests for fuelwood.

Coal

Sand stowing in mines has been constrained by the limited availability of sand within economic distance from the mines. There has been suggestions for utilizing the fly ash generated at the power plants for mixing with sand for stowing of the mines. The idea is to use the same transportation system as carriers coal from the mines to the power stations for the fly ash during the return journey. The dimension of the fly ash problem is expected to assume large proportion as coal with increasingly high ash content is supplied to the power stations with mining of lower grade of coal.

Consideration for energy efficiency at national level would call for location of industries closer to the resource base, to reduce pressure on the transport sector, which remains one of the most energy-intensive sector. The policy of tele-

scopic freight rate for the railways introduced a distortion in the pattern of resource utilisation which caused severe set-back to the growth of industries in the regions endowed with natural resources like coal, steel and lately petroleum. Revision of the current policy would be advisable if a rational view is to be taken for optimal utilization of the exhaustible resources in the country.

Hydrocarbon

The long term policy for exploitation of oil resources of a country cannot be formulated without regard to the condition of the reserve elsewhere and policies pursued by the owner countries around the world.

The present policy aiming at meeting all internal requirements from indigenous reserves cannot be maintained upto the period of exhaustion of the reserve. It will be necessary to import oil at such periods when our rate of exploitation declines below the level of our requirement. The choice, given such prospects, would lie between determining a level of import in the current period and saving a corresponding amount in the reserve for consumption in future on the one hand, and exhaustion of the indigenous reserve to meet the domestic demand in the early stage

and resort to import of oil from other sources at a later stage on the other hand. There is thus a question of trade-off between incurring expenditure involving foreign exchanges in the current period at the prevailing price of oil and spending foreign exchanges at a future period on the purchase of an equivalent amount of oil at a price escalated due to increasing scarcity all around. The issues posed here, however, presume the present status of substitutability between petroleum and other resources remaining unchanged over the period under consideration.

Nuclear Energy

Nuclear energy is not the ultimate solution to the energy crisis. Notwithstanding the advances claimed for nuclear technology the country will have to depend substantially on coal as the bridge fuel for transition to the stage for energy based on renewable resources. The superiority in economics of nuclear power over coal based power is not clearly established. The problem of safety in operation and disposal of long-lived waste awaits satisfactory solution. It would be advisable to move with caution in expanding the capacity of the nuclear power plants. □

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