

CHAPTER 7

ENERGY

7.1 BASIC FEATURES

7.1.1 The fact that Guyana does not itself produce any significant amount of energy, combined with the high price of imported fuel, has had a profound effect on the country's economic and social development. Between 1966, the time of independence, and 1975/76, Guyana's economy grew at an average rate of over 7 percent per annum. However, with the coming of the oil crises in the mid 1970s, the frailties that were inherent in its economic management were exposed, and growth became negative. The radical steps which were then taken to adjust the economy and reverse its decline did not work. As a result, Guyana's citizens experienced severe economic and financial hardships, the effects of which are still being experienced. It is arguable, therefore, that the energy factor was one of the main contributing elements in the creation of a depressed economic climate which, in turn, added fuel to latent political dissatisfaction.

7.1.2 The principal primary sources of energy in Guyana are petroleum products, (which are all imported), bagasse and fuelwood. In 1999 they accounted for 67 percent, 26 percent and 7 percent respectively, of the energy produced. Portions of all are transformed to electricity for use in all sectors. In 1999, electricity generation, industry, and mining accounted for 90 percent of the utilisation of the primary energy supplied.

7.1.3 Petroleum

7.1.3.1 Although intensive petroleum exploration had been undertaken in Guyana since the late 1950s, petroleum has been brought to the surface only in the Takutu Basin in the late 1970s. There has never, however, been any commercial exploitation of this fossil fuel.

7.1.3.2 Petroleum exploration is currently being promoted in three areas of Guyana: the offshore Guyana Basin, the onshore coastal section of the Guyana Basin, and the Takutu Basin, which is inland in the Rupununi District. Seismic coverage on all these areas has improved significantly since 1985, and the existing policy is to offer attractive production sharing agreements to investors for fields with upside potential.

7.1.4 Hydropower

7.1.4.1 The economic potential of hydropower is estimated to be in the region of 7000MW. Although this resource is not now being exploited to any significant extent, it is considered that a large part of the solution to the country's long-term power requirements lies in hydro-energy.

7.1.4.2 The Guyana Natural Resources Agency (GNRA) has prepared a position paper on the development of medium and large scale hydroelectric facilities in Guyana. Based on existing data and previous studies, six sites have been identified with the purpose of selecting one for development in the first instance. These six sites are located at Tiboku in the Mazaruni Potaro River Basin; at Amaila and Tumatumari in the Potaro River Basin; at Kamaria in the Cuyuni River Basin; at Tiger Hill in the Demerara River; and at Arisaruru in the Essequibo River Basin.

7.1.4.3 All these sites have been studied up to the pre-feasibility level, but environmental impact assessments have not yet been undertaken.

7.I.4.4 It is evident that Hydro Power represents a major economic endowment and opportunity for Guyana both as a primary source of power for domestic consumption, and as the hub around which the development of the country's economic potential could revolve. It would seem from the available data, that priority should be given to the development of Amaila, the utilisation of which would enable the establishment of industries such as the smelting of aluminum, and yet leave sufficient excess capacity to serve the remainder of Guyana's domestic and industrial needs for some time to come. It is also clear that urgent attention should be given to the promotion of investment in mining and other energy intensive areas of Guyana's economy.

7.I.5 Bagasse

7.I.5.1 Bagasse is currently used for the co-generation of steam and electricity in the sugar industry. An analysis of the potential of this energy source has confirmed that more electricity could be generated than is currently the case if bagasse was utilised more extensively as a fuel. Two of the potential barriers to expanding the supply of electricity based on bagasse, include the absence of year-round cane supplies, and the cost of converting the installed machinery in sugar mills to accommodate the bagasse raw material. It is proposed, however, to utilise relatively large quantities of this raw material in the modern sugar mill which, as described in another chapter of this document, will be established in the near future. This modern mill will be designed for the co-generation of bagasse and other types of fuel.

7.I.6 Fuelwood

7.I.6.1 Forests cover approximately 75 percent of the country's land area. However, the active encouragement of increased fuelwood consumption would have to be tempered by environmental concerns. *In situ* woodwaste from the timber industry remains a viable potential source of energy. At the current time, two lumber enterprises generate a total of 3 MW of power from woodwaste for their industrial use. In order to tap, more effectively, the fuelwood potential over the longer run, it is important to begin reforestation efforts promptly in the deforested zones adjacent to coastal areas.

7.I.7 Other Sources

7.I.7.1 Rice husk is also a potential source of energy and is now currently used by two rice millers for steam and electricity generation. And although solar and wind energy play a very small role in Guyana's energy spectrum, their potential contribution in the long-term cannot be disregarded.

7.I.7.2 Biogas digesters provide methane gas for cooking and refrigeration. In the residential sector, the impact is more social and environmental than economic, because the cost of construction of these digesters is almost prohibitively high. For large commercial and agricultural enterprises, however, this technology can be cost-effective.

7.II ISSUES AND CONSTRAINTS

7.II.1 No country in the world has been successful in shaking loose the shackles which hold back a developing country such as Guyana without gaining access to the services which a modern energy sector provides. The history of development identifies an efficient energy system as one of the prerequisites to facilitate social development and to fuel growth. There is no evidence to the contrary. There is however, voluminous evidence confirming that the lack of such access constrains social development and economic growth.

7.II.2 The underlying purpose of any energy strategy is the stimulation of economic development by securing reliable sources of energy as economically as possible. Since energy is an input to other activities, its demand is derived. Consequently, the desirable level of energy production and supply cannot be specified independently of expected levels of activity in other areas of the economy. Energy production is, however, not in itself the only requirement for successful development. As important, is the necessity for it to be reliably supplied. This latter consideration implies a steady supply, 24 hours a day and 365 days per year and, in the case of electricity, one that is not plagued by voltage fluctuations.

7.II.3 Unfortunately, the Guyana Power and Light Company, which generates most of the energy consumed in Guyana, does not meet the required criteria: its production volumes are too low, and it is far from reliable. It follows, therefore, that unless steps are taken expeditiously to improve this company's performance, or to secure additional sources of energy, our developmental progress would be somewhat hindered, and the attainment of many of the objectives of the National Development Strategy would be curtailed.

7.II.4 Petroleum products, which account for almost 50 percent of our energy supply, are all imported. Because our supplies of foreign exchange are, at the best of times, not overly plentiful, this is yet another serious constraint to our development. We must therefore seek to reduce our dependence on this commodity, primarily by conserving energy but also by the increased exploitation and utilisation of indigenous energy resources. It is perhaps unnecessary to state, however, that it is essential that considerations of cost-effectiveness be kept at the forefront when planning the possible utilisation of each potential source of energy.

7.II.5 Overall, energy demand can be expected to grow much more rapidly than the general economy, in part because the manufacturing, agricultural and services sector will expand faster than the GDP, and in part because some of the major new industries that are strategised for in the National Development Strategy are especially intensive in the use of electricity. Thus the demand for electricity in Guyana which was 70.0MW in 1999, is conservatively projected to increase to about 90 MW by 2005 and to 120.2MW by 2010.

7.II.6 Finances are another major constraint to the development of energy supply systems in Guyana, for such systems usually require large capital investments. It should be evident that the Government is unable, and will be unable for a long time to come, to fund such development from revenue, even if taking such a course was desirable. It would also be tremendously difficult to raise such funds through borrowing in the open market, if only because the conditionalities of the Bretton Woods institutions do not currently permit the taking of such a step. This constraint, therefore, effectively limits the capability to invest, for example, in our hydropower resources.

7.II.7 Potential investors in other sectors of Guyana's economy are discouraged not so much by the unit cost of utility electricity as by the sheer inconvenience of self-generation, and the damage that is currently caused by its erratic supply. In addition, small enterprises, potentially the most important source of new employment, are discouraged from starting up their businesses because of the high cost of generating their own power.

7.II.8 Another constraint to the development of the energy sector is the fact that, like many small developing countries, Guyana has very little indigenous technological capability in energy supply systems. The country therefore remains technologically dependent, even though our manufacturing sector has demonstrated some capability in the production and development of some types of energy supply equipment. One firm, for example, has manufactured a mini-hydropower turbine. Another company is producing solar water heaters. Programmes to develop and disseminate biogas and solar drying technologies have also had some degree of success. However, the country has neither the productive capacity nor the technological knowledge to produce large-scale energy supply systems.

7.II.9 One additional issue which faces the sector, from a technological point of view, is the cost–competitiveness of some technologies for using some of our domestic energy resources. For example, many ideas for utilising renewable energy sources such as solar and wind power, are appealing, but the costs are high. However, it seems to be the view of many experts that wind energy applications can prove cost–effective, and researchers are confident that in the future the cost of solar power generation could be considerably reduced.

7.II.10 The imperative of avoiding environmental degradation in the development process has already been emphasized, and the need to take into account the potential environmental effects of all projects, including those that are related to energy, has already been stressed. Suffice it merely to state here, therefore, that the assessment of the impact of all energy development projects on our environment will be an integral part of all our efforts in this direction. As will be indicated later in this chapter, the National Development Strategy places great emphasis on the utilisation of our hydro power resources for our future development. This could, however, have major localised environmental effects which will be monitored closely. In many respects, the environmental imperative presents a greater challenge to energy planners than to most other sectors.

7.III SECTORAL OBJECTIVES

7.III.1 The energy sector can play a strategic role in the development of Guyana’s economy. Indeed, as we have strongly indicated, if our country is to realise its very considerable development potential, a reliable system of electricity generation and transmission is essential. We simply cannot competitively produce goods and services in the hinterland of our country, if the companies that are engaged in such exercises are forced to generate their own power. The costs and inconveniences that are inherent in the self–supply of electricity are so high that they are effectively prohibitive for smaller enterprises; and, of course, they are out of the question for most householders. In any case, a modern economy cannot be built on the basis of individual electricity generators. A properly functioning system with adequate capacity is therefore needed.

7.III.2 Accordingly, the principal and overall objective of the energy sector is the securing of an adequate and dependable supply of electricity in order to ensure the country’s future economic development. This includes improving the quantity, quality and reliability of the electricity supply. It implies reducing the frequency and magnitude of voltage fluctuations, as well as the frequency of outages. Specific objectives include (i) reducing our dependency on imported petroleum products; (ii) increasing the utilisation of new and renewable domestic energy resources; (iii) ensuring that energy is used in an environmentally sound and sustainable manner; and (iv) encouraging, through public awareness programmes and incentives, energy conservation practices.

7.IV THE STRATEGY

7.IV.1 The general strategy will be, through fiscal incentives, to encourage investment in the energy sector, particularly in locations away from the coast. It is imperative that the energy–generating capacity in the interior districts be significantly enhanced, if we are to be able to increase economic activity in all parts of Guyana, attain an equitable distribution of economic activity, and eradicate poverty in the most depressed areas of our country.

7.IV.2 Whenever feasible, locally available energy resources will be utilised in local production e.g. bagasse in sugar and rice mills, and wood waste in sawmills. Producers will be encouraged to utilise these resources through the provision of tax credits.

7.IV.3 Similar schemes will be put in place to encourage the use of wind and solar energy.

7.IV.4 Of the potential hydropower sites that have been listed earlier in this chapter Amaila, in the Potaro River Basin, has proved to be the most feasible. Its feasibility depends of course, upon the significant utilisation of the energy which it generates. In putting forward proposals for its financing, therefore, the potential market for the energy which will be supplied from Amaila, will be carefully described. A sales campaign will be mounted specifically to promote investment in this project. An investment package which will involve, in addition to private sector financiers, bi-lateral donors and the International Financial Institutions, will be formulated. The idea will be to persuade a consortium of financiers to invest in the project. The proposals to the consortium will include provisions for Build-operate-transfer, or Build-own-operate arrangements.

7.IV.5 While all this is being arranged, Guyana will enter into negotiations with the Venezuelans to purchase power from Guri. This will be the culmination of a process which was begun in 1991. It is more than possible that the Inter-American Development Bank would be interested in the financing of such a project. It is perhaps fortunate that an agreement has recently been reached between Brazil and Venezuela, for Brazil to purchase energy from the same source. As the Brazil power lines will run to an area very near to the Takutu, across Brazil's border with Guyana, it will be relatively easy and inexpensive to tap the necessary resource. The energy so obtained will be utilised throughout Guyana, and will be connected to the national grid.

7.IV.6 The intention will be to run lines from Boa Vista to Lethem, and thence to Mabura Hill. At that point, there will be a divergence, with one branch running to New Amsterdam through Kwakwani, and the other going through Linden to Georgetown.

7.IV.7 One important advantage of this arrangement is that it will immediately make feasible the production of aluminium and a range of other industries in the interior of our country.

7.IV.8 The available information strongly indicates that the type of inter-connection that is being described here will be vigorously supported by the Organisation for Latin American Energy Development, where the main mission is the establishment of a Latin American energy network throughout Central and South America. There is additional information that Surinam would be desirous of becoming involved in such an arrangement, if only because it would be much cheaper for them to access electricity from such a proximate source. Guyana will, of course, profit from such an exercise through its obtention of transit fees.

7.IV.9 When Guyana's hydropower supplies come on stream, they too can be connected with the continental grid, and be sold to other buyers.

7.IV.10 There is no intrinsic reason why such a scheme should not work. Indeed, in many parts of Africa, and, of course, in Europe, these inter-connections between and among countries are commonplace. It is probable, though, that Venezuela's claims upon our territory might cause some Guyanese to be cautious and to reject the idea, despite the obvious economic benefits. It is for this reason that it is urged that there be the fullest consultation on this matter between whatever government is in power and the citizens of Guyana. This is, of course, part and parcel of our strategies on governance. In these types of exercise, inclusivity and transparency are of the utmost importance.