Energy Security Issues and Regional Cooperation in Hydropower Development

In recent years, as a result of economic and population growth, South Asia has experienced a sharp increase in energy consumption. As a consequence, the growth in commercial energy demand in these countries is very high compared to other regions of the world, and is projected to continue to grow in future. This rapidly growing energy demand coupled with inadequate supplies is a challenge for the energy security of South Asia. Despite its rich resource endowment, the region continues to face power shortages, which has constrained economic growth.

The region is well endowed with natural resources and there is tremendous scope for cooperation in the field of energy. Nepal and Bhutan, the two neighboring countries of India have rich hydropower potential far in excess of their domestic requirement. India with its large demand supply gap offers a ready market for these two countries. Cooperation between India, Nepal and Bhutan on the energy front can therefore provide a win-win situation for all. India could import hydropower to meet part of the country's energy needs. Nepal and Bhutan, on the other hand, could earn rich revenue to boost their economy. Besides, it could open up options of electrifying the border areas of these countries by extending the power grid of India. This could also lead to the evolution of the South Asian Association for Regional Cooperation (SAARC) power grid. The status of cooperation between these countries is discussed below.

Cooperation with Nepal

India has been assisting Nepal in the development of its hydropower potential. Four hydroelectric schemes, namely, Pokhra, Trisuli, Western and Gandhak and Devighat, have been implemented in Nepal with financial and technical assistance from India. The Government of India nominated the Power Trading Corporation (PTC) as the nodal agency to deal with matters relating to power exchange with Nepal in July 2001. PTC is also the sole agency from the Indian side for finalizing all commercial and technical arrangements/systems with Nepal Electricity Authority (NEA) and coordination with associated Indian agencies. The bilateral exchange of power at the borders between the two countries is presently at a level of 50 MW. The two sides through Indo-Nepal Power Exchange Committee decide the tariff jointly at periodic intervals with the underlying principle of meeting the cost of supply of power. The power exchange between the two countries is made possible by interconnections at the voltage levels of 11 kV, 33 kV and 132 kV at 22 interconnection points.

During 2003–2004 Nepal had imported around186 million units (MUs) of energy from India and exported 138.90 MUs. As per the water resources strategy of Nepal, by 2017 Nepal aims to develop 2,230 MW hydropower to meet the projected demand of 2,230 MW including 400 MW for export to India. Under a high growth scenario, the strategy projects that by 2027 the country would earn significant national revenue by developing a total hydropower capacity of 22,000 MW including 15,000 MW for exports.[27]

Three major multi-purpose projects in Nepal, viz. Karnali, Pancheshwar, and Saptakoshi are presently under discussion at various levels as mutually beneficial projects. The feasibility report for the Karnali multi-purpose project (10,800 MW) was prepared in 1989. Key parameters of this project are to be finalized after mutual discussions. A Joint Committee on Water Resources headed by the respective water resources secretaries has been constituted to act as an umbrella committee to ensure implementation of the existing agreements and also to oversee work of all technical and expert-level committees related with water resources. During the meeting of the Joint Committee, it was decided to initiate consultations for the development of the Karnali Project. Investigations have been carried out in respect of the Pancheshwar multi-purpose scheme (5,600 MW) by the two countries in their respective territories. A Joint Project Office (JPO) was established in Kathmandu in December 1999 to carry out additional investigations and for preparation of the DPR. The JPO was closed in July 2002. A draft DPR has been prepared by the Indian side, which is to be mutually agreed to. Development of this project is covered under the Integrated Mahakali Treaty signed between Nepal and India in February 1996. India has offered financial and technical assistance for investigation and preparation of the DPR of the Saptakoshi High Dam Multipurpose project and Sun Kosi Storage-cum-Diversion Scheme. A JPO was established on 4 August 2004 in Biratnagar, Nepal, for taking up field investigations and studies for preparation of the joint DPR in about 30 months. Besides the above, a number of other projects, such as Burhi Gandaki (600 MW) and Upper Karnali (300 MW), are also under discussion between India and Nepal. Joint technical expert groups have been constituted for the above projects for guidance for carrying out investigations and preparation of the DPRs.

Cooperation with Bhutan

India has had a long association in providing technical and financial assistance to Bhutan in the development of its hydropower resources. Electricity is Bhutan's principal export commodity and the largest revenue earner. Chukha hydropower project (336 MW) has been an important project developed as a joint venture between the Government of India and the Royal Government of Bhutan, with the Government of India providing the funds for the project. The construction of the Chukha hydroelectric plant was started in 1978. It was successfully commissioned in 1988. The project was handed over to Bhutanese management in June 1991. About 84% of energy generated from Chukha plant is exported to India.The Kurichu Hydroelectric Project (60 MW) in eastern Bhutan has also been implemented with Indian financial and technical assistance. Energy traded during 2003–2004 was around 1,752 MU (1,495 MU from the Chukha and 257 MU from Kurichhu).

Another project, viz., the Tala Hydroelectric Project (1020 MW) has been taken up for implementation and is being executed by Tala Hydro-electric Project Authority (THPA) comprising the Indian and Bhutanese engineers. Design and engineering consultancy for the project in respect of the electro-mechanical and civil works is being rendered by the CEA, Central Water Commission (CWC), and Water & Power Consultancy Services (WAPCOS). The project is being funded by India through grant and loan and a major portion of the power generated will be utilized by India. The project is scheduled for completion by 2005–2006. Investigation of Sankosh multi-purpose project

[27] SASEC. 2004. Issues Paper on Regional Energy Cooperation, prepared by Leena Srivastava and Neha Misra.

(4,060 MW) has been completed by the CWC and DPR prepared by the CEA/CWC. Investigation of two hydroelectric projects, namely Wangchu (900 MW) and Bun akha (180 MW), have been completed and the DPR prepared. Further, the Government has agreed to provide assistance for development of two hydro projects, namely Mangdechhu (360/600 MW) and Punatsangchhu (870/1000 MW). A multi-disciplinary team visited the Punatsangchu project site in May 2004 for identification of alternative sites and also to firm up associated survey and investigation for the preparation of DPR and at present, this survey and investigation work is in progress.[28]

Cooperation with Myanmar

The possibility of developing the Tamanthi project (1,020 MW) in Myanmar and importing power to India has been under consideration for some time. Presently NHPC is preparing a PFR for this project.

[28] TERI Energy Data Directory & Yearbook, 2004–05.