Literature Survey on Cross Border Power Trading

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Abstract

Energy remains one of the key inputs to socio-economic progress in developing societies. South Asian nations, namely Afghanistan, Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan, and Sri Lanka, have so far lagged far behind their developed counterparts in terms of access to clean, reliable, and affordable energy, especially electricity. The existing power shortages and growing import of fossil fuels impose a heavy cost of energy insecurity to the region. The energy endowments of South Asia are limited and dispersed across the region, with large unexploited hydro-electric potential in some parts and growing dependence on fossil fuels in other parts. The Interconnection of two electrical systems with diverse generation mix and demand characteristics can bring operational, economic, as well as environmental benefits to the respective country as well as to the region as a whole. There are also benefits to the global environment as there would be an improvement in operational efficiency of thermal generation with an appropriate mix of hydro resources available in the region. An interconnected power system can more economically address the daily as well as seasonal variation in electricity demand in the respective countries. This paper presents various advantages of Cross Border Trading.

Keywords: Energy, Cross Border Power Trading, Fossil Fuel.

1. Introduction

Power is one of the major sources in a countries development. Energy is critical, directly or indirectly, in the entire process of evolution, growth and survival of all living beings and it plays a vital role in the socio-economic development and human welfare of a country. Electricity sector in India is the world's fourth largest generation

capacity with 245.394 GW[1] as of end of April 2014. As of January 2012, one report found the per capita total consumption in India to be 778 kWh. The per capita average annual domestic electricity consumption in India in 2009 was 96 kWh in rural areas and 288 kWh in urban areas for those with access to electricity, in contrast to the worldwide per capita annual average of 2600 kWh. Regional energy trade could significantly contribute to improved energy supply and economic growth[2]. Securing adequate energy supply has to be tackled at both the national and regional levels. There is abundance of energy resources within the region and its immediate neighbors in the west (Central Asia and Iran) and in the east (Myanmar). A large share of the resources is in hydropower and natural gas, some of the environmentally cleanest forms of energy. Their geographic distribution is uneven and different from the distribution of demand. Bhutan, Nepal, Myanmar and Central Asian economies (such as Tajikistan and Kyrgyz Republic) have energy resources far in excess of their domestic needs. India currently suffers from a major shortage of electricity generation capacity, even though it is the world's fourth largest energy consumer after United States, China and Russia.

The countries of South Asia (SA),[3] comprising Afghanistan, Bangladesh, Bhutan, India, the Maldives, Pakistan, Nepal, and Sri Lanka, are home to 23 per cent of the world's population. The region is far behind its developed counterparts in terms of economic well-being as well as access to clean energy, particularly electricity and its consumption. South Asia has limited fossil fuels but ample hydro resources. There is, however, a disparity in the distribution of these across the region. Limited oil and gas resources have led to a growing dependency on imports. Electricity generation largely depends on available domestic resources. Some countries of the region depend significantly on coal while others are dependent on hydro resources to generate electricity. Bhutan and Nepal depend on Himalayan-fed hydro resources. Bangladesh, the Maldives, and Sri Lanka are largely dependent on fossil fuels. Afghanistan is struggling to rebuild its hydro-electric capacity, but investments for new capacity are yet to catch up with requirements. In transit to the further creation of capacity, it is importing electricity from trans-border linkages. The two large economies, namely India and Pakistan, depend on a mix of hydro and fossil fuel-based capacity, though they are increasingly becoming more dependent on fossil fuels.

2. Demand-Supply Gap

The developing economies of South Asia are expected to witness moderate to high economic growth in the future. This would also place a considerable demand on the growth of electricity availability. The projected demand for electricity is expected to grow at a CAGR of 7.4 per cent [4]Given the current status of energy resources in individual countries, this goal presents a challenge to the policy-makers. A greater percentage of the power generation in the region is dependent on fossil fuels. A two-fold increase in electricity demand would lead to a significant environmental burden. The need for sustainable growth in the power sector in the region, thus becomes an important driver for promoting regional power sector cooperation in South Asia.

Projected Electricity Demand[5]			
	Demand (GWh)		CAGR(%)
	Year (2010)	Year (2020)	
Afghanistan	2600	6750	10
Bangladesh	28470	67400	9
Bhutan	1749	3430	7
India	938000	1845000	7
Maldives	800	1300	5
Nepal	3200	6910	8
Pakistan	95000	246000	10
Srilanka	10718	21040	7
Total	1080537	2197830	7.4

3. Advantages of Cross Border Power Trading

Equally critical task is to build the capacities of the policy makers in power sector across the region by re-skilling and reorienting them to the advantages of power trading. What the present day policy makers in the region lack is information, sensitization and the alternative options and ways to consider the projects and their implementations for across border cooperation.

The power generation in India is mainly by Coal which is provide by Coal India Limited(CIL)



But due to limited resources of Coal in India, CIL imported coal from outside. To bring fuel is getting more costly then transmitting power from neighbor countries, which not only help to meet the demand generation gap but also provide the healthy relationship between each others.

Demand and supply gap is huge so by trading power with neighbor countries not only help to meet the demand but also help to grow the economy of the country. India operates a supply constrained power sector in which the shortage of peaking capacity and energy deficits in FY 2006 were estimated at 11.6% (13,400 MW) and 7.6% (54 TWh) respectively.7 Its power system at present has about 124 GW [5]of

installed generation capacity, of which 26% is hydropower, 2.5% nuclear, and the rest is thermal technology. The momentum of economic growth anticipated for the medium term is expected to lead to an electricity demand growth of the order of 7% to 8% per annum through the decade. Given the investment and implementation constraints, the capacity and energy deficits are expected to persist and may even worsen to some extent. Indian natural gas reserves and production were estimated at 854 BCM and 32 BCM respectively in FY 2004. Medium to long term forecasts indicate inadequate domestic supply in relation to rapidly growing demand. In this context the country's options for supply augmentation clearly include natural gas and electricity imports from cost effective and reliable sources



Net import of coal, crude oil & petroleum in India

4. Conclusion

Institutional change supporting economic enhancement and growth at a social level requires economic incentives, supported by political will. With India moving into a new era of economic liberation, the region should not be left out. The framework for development of the region can be broadly based upon four vital components. The first component of this development plan should be social empowerment. It needs to empower rural communities, create sustainable institutions so that they manage common activities around microfinance, livelihoods and natural resource management. The second component needs to be economic empowerment. The objective of this component should ideally be to develop the capacity of rural communities to plan and manage funds for various economic initiatives and common activities for the public. The third component will be partnership development. The objective of this component should be to partner with various service providers, resource institutions

and public and private sector organizations to bring resources such as finance, technology, and marketing into the project so that the community groups are able to improve their livelihoods. The fourth and final component will be project management. This will facilitate various governance, implementation, co-ordination, learning and quality enhancement efforts in the project.

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