

Regional Electricity Sector Cooperation in South Asia – The Way Forward

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South Asian countries continue to lag behind their developed counterparts in terms of access and availability of quality electricity supply (Figure 1). Availability of power supply still remains a drag on the economic growth and development in South Asia, despite the fact that a number of countries including India, Pakistan, Bangladesh and Sri Lanka have witnessed moderate to significant power sector reforms that include partial or full unbundling of the erstwhile state-owned power sector utilities and setting up of electricity regulatory commissions (See Singh et al. (2015) for further discussion).

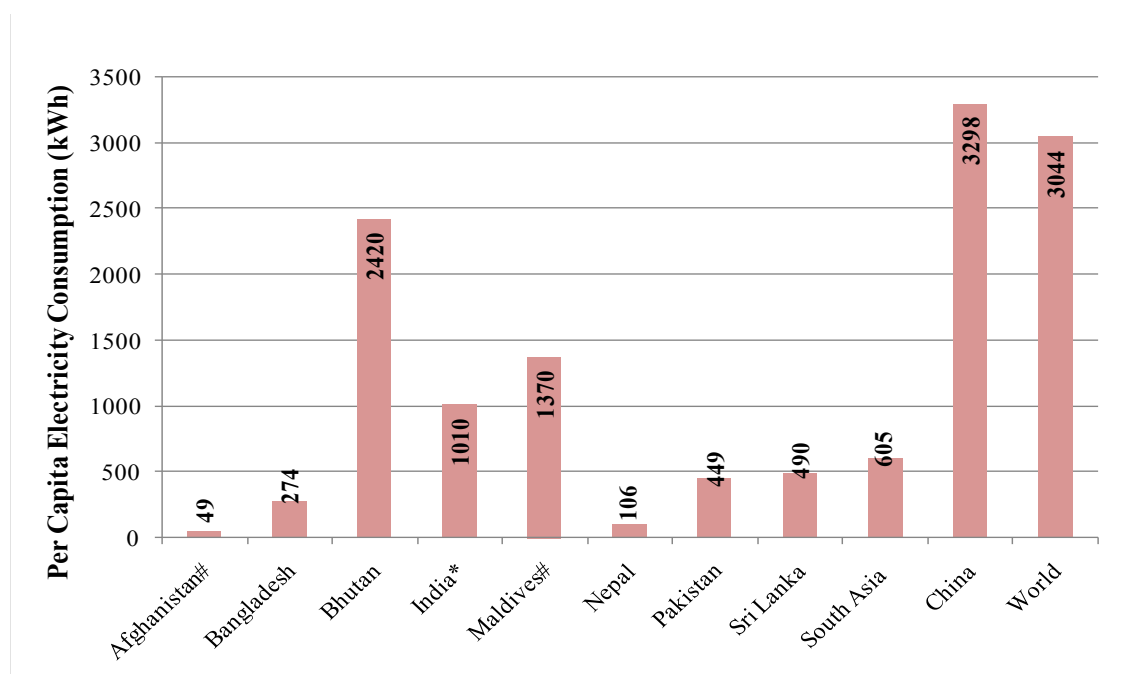


Figure 1: Per capita electricity consumption in South Asia

(Source: Compiled by the author from WDI and other sources [* - 2015 for India, # - 2009 for Maldives, 2011 for others])

Recognizing the benefits of interconnection, erstwhile isolated power systems within countries were interconnected, initially on asynchronous pieces, then gradually synchronized through AC interconnections. Cross-border interconnections had a very long

history, the first being witnessed in Europe. Today, the world is home to a number of regional electricity cooperation arrangements across the Americas, Europe, Africa and Asia. These regional electricity market initiatives include the Central American Electrical Interconnection System (SIEPAC), the European Network of Transmission System Operators for Electricity (ENTSO-E), the Greater Mekong Sub-region (GMS), ASEAN Grid, the Gulf Cooperation Council Interconnection Authority (GCCIA), the Energy Community of South East Europe (ECSEE), the Southern Africa Power Pool (SAPP) and the West African Power Pool (WAPP).

Lack of adequate domestic resources and unfavorable investment climate have hindered the growth of generation capacity in South Asia (Table 1). Due to the domestic portfolio of energy resources of the South Asian countries, the existing generation capacity in these countries is skewed towards either hydroelectric or thermal electricity generation assets. Amidst abundance of hydro resources, Nepal continues to witness regular and long power cuts, thus making it a net importer of electricity from India (Figure 2).

	Energy Resource Potential					Actual
	Coal	Oil	Natural Gas	Hydro-power	Biomass	Generation Capacity
Country	(million tons)	(million barrels)	(trillion cubic feet)	(MW)	(million tons)	(MW)
Afghanistan	440	NA	15	25,000	18–27	
Bhutan	2	0	0	30,000	26.6	1480 (2014)
Bangladesh	884	12	8	330	0.08	8537 (2014)
India	90,085	5,700	39	150,000	139	243028 (2015)
Nepal	NA	0	0	42,000	27.04	720 (2013)
Pakistan	17,550	324	33	45,000	NA	23412 (2013)
Sri Lanka	NA	150	0	2,000	12	3312 (2013)

Table 1: Energy resource potential and electricity generation capacity in South Asia
(Source: Compiled by the author)

Cross-border electricity sector cooperation in South Asia began as India and Nepal agreed to electrify the habitations along the border areas of the neighboring country. There

are currently 22 cross-border radial links at 132/33/11 kV between the two countries. During 2014-15, Nepal imported 994 MU from India compared to 702 MU in the previous financial year. Nepal Electricity Authority imports electricity from the Indian market through PTC India Ltd. Electricity trade between India and Bhutan exemplifies a mutually beneficial cross-border electricity cooperation. India imported 4965 (5556) MU of electricity in 2014-15 (2013-14). Electricity export accounts for a significant share of export income and the total GDP of Bhutan. Further, it has also allowed Bhutan to provide electricity access to its population (with a significant share of royalty power) and help create local employment.

Bangladesh and India have entered into a bilateral agreement whereby the former will import up to 500 MW of power from India, part of which would be sourced at market prices. Bangladesh imported 3273 MU of electricity from India during 2014-15. It is interesting to note that even in the absence of electricity market reforms in both the countries, both Bangladesh and Indian are able to benefit from the presence of a competitive power market in India through cross-border electricity trading. The benefits of regional electricity cooperation could be larger and more encompassing than the existing bilateral cross-border electricity trade.

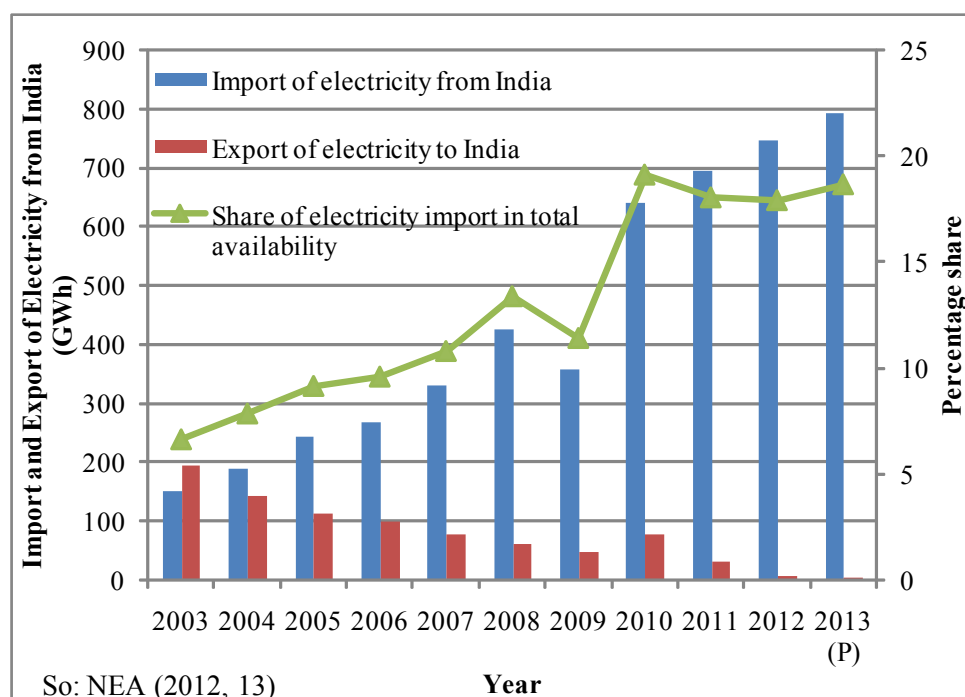


Figure 2: Growing electricity import in Nepal

(Source: Singh et al., 2015)

Electricity demand in the South Asian countries is expected to grow at 7-10 per cent per year. To overcome existing power shortages and to provide access to over 400 million people and meet their growing aspirations, the South Asian countries should pool together their energy resources for improving the availability of electricity and the economics of providing the same. Cross-border interconnections for electricity exchange bring forward a number of technical, operational as well as commercial benefits. Apart from economies of scale in investment in generation capacities, operational synergies due to differences in load and generation profile across the countries offer economic benefits to the Singh et al. (2013) identify and discuss various benefits of regional electricity cooperation.

International experiences stands as examples to show that most of the regional electricity market arrangements evolve from bilateral trades. The journey often takes decades and needs wider political support from the member countries. The technical and operational harmonization of applicable codes especially those dealing with transmission allocation and system imbalances provide an environment conducive to developing a seamless regional electricity market. In November 2014, the members of South Asian Association for Regional Cooperation (SAARC) signed the Framework Agreement on Energy Cooperation (Electricity) for furthering regional cooperation in electricity. Coordination between regulatory institutions and electric utilities, and participation of other stakeholders including the academia can help lay the groundwork for achieving the common goal of providing reliable and affordable electricity across South Asia.

Suggested Further Readings:

- Singh, Anoop; Jamasb, Tooraj; Nepal, Rabindra; Toman, Michael A. (2015) "Cross-border electricity cooperation in South Asia", World Bank Policy Research Working Paper #WPS7328, The World Bank, Washington DC.
- Singh, Anoop (2013), Report on "Study on a South Asia Regional Power Exchange - Regulatory" Submitted to the Asian Development Bank, Manila.
- Singh, Anoop, Jyoti Parikh, K.K. Agrawal, Dipti Khare, Rajiv Ratna Panda and Pallavi Mohla (2013) "Prospects for Regional Cooperation on Cross-Border Electricity Trade in South Asia", IRADe, New Delhi.
- Singh, Anoop (2010) "Towards a Competitive Market for Electricity and Consumer Choice in Indian Power Sector", Energy Policy, Volume 38, pp 4196-4208. (Elsevier)
- Singh, Anoop (2006) "Power Sector Reform in India: Current Issues and Prospects", Energy Policy, Volume 34, Issue 16, pp 2480-2490. (Elsevier)



About the author

Dr. Anoop Singh is an Associate Professor at Department of Industrial and Management Engineering, IIT Kanpur. He is a Member of the Working Group on Power for the 12th Five-Year Plan, Planning Commission. Mr. Singh has undertaken a number of research/consultancy projects related to electricity / energy sector for a number of institutions including the World Bank, Asian Development Bank, the UNCTAD, UNU/IAS, Asian Institute of Technology, the University of Cambridge, and the Planning Commission.

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