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## Regional power trading and energy exchange platforms

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### Abstract

South Asia is the home of over 1.6 billion people. The countries in the region are aspiring to become fully developed nations by the middle of this century. Rapid industrialization and attainment of sustainable development goals (SDGs) are important requirement to achieve this goal. South Asian nations thus need secured energy and power generation, distribution and supply. Currently the entire South Asian region is energy deficient. Hence achieving energy security and adequate generation of power pose a major challenge. However, regional and sub-regional collaboration in energy and power can enhance energy security if indigenous energy resources are collectively utilized by the member countries. The recently established Indian Energy Exchange (IEX) aims to facilitate in-country and cross-border power and energy trading. Both power producers and buyers can bid live through the IEX platform. This paper reviews some features of IEX and Australian Energy Market Operator (AEMO) in order to understand the operating mechanism of such energy and power trading platforms.

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### 1. Introduction

South Asian region of Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka is the home for nearly one-quarter of world's population (~1.7 billion) today. Despite having huge population, the region is

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significantly lagging behind in economic and human development indices [1-6]. The inadequate power generation and grid connected supply are considered to be the main hindrance [7-12]. All South Asian countries are aspiring to become fully developed nations by the middle of this century. Rapid industrialization and attainment of sustainable development goals (SDGs) are important requirement to achieve this goal. Currently the entire South Asian region is energy deficient [10-13]. They need secured energy and power generation, distribution and supply. The current installed power generation capacity in each South Asian nation is shown in Fig. 1. The energy mix for power generation varies significantly in South Asia. The power generation in Bhutan and Nepal is hydro based while Maldives power generation is fully dependent on imported fossil fuel. Coal is the primary energy for power generation in India while the natural gas predominantly is for Bangladesh.

**2. Energy/Power Exchange**

There are generally two ways to reduce the energy/power cost: a) price of energy/power that customers pay and consumption of energy/power itself. Despite raising awareness about energy conservation and efficient generation, it is still difficult to reduce energy consumption mainly due to increased modern needs. Therefore, the focus is now on the price of energy and power that consumers pay. Efficient production and right procurement process are keys to reduce the consumer’s energy price. However, the right procurement process is complex and daunting. Hence there is a need for Power Exchange through which both producers and buyers can have competitive market access. Power Exchange is a hub where the market price (spot price for short-term trading and forward price for future date) is determined based on demand and supply. The principal stakeholders in power exchange are: a) power producers, b) power retailers and c) large end users. The importance of energy/power trading through exchange has grown rapidly in Europe and elsewhere due to increased energy consumption and market integration. Today, almost no country can address its energy/power needs from its own sources. Energy/power trading through exchange ensures: i) required supply and ii) protection from supply shortages and price fluctuations. There are several regional or in-country energy and power exchanges have been established in Europe, North America and Australia [14-16]. Some major power exchanges are:

- a) Nord Pool Spot for Nordic countries (Sweden, Finland, Denmark and Norway) and Baltic States (Latvia, Lithuania and Estonia)
- b) EPEXSpot for France, Germany, Switzerland and Austria
- c) Nodal Exchange for North America (USA, Canada)
- d) Australian Energy Market Operator (AEMO) for Australia

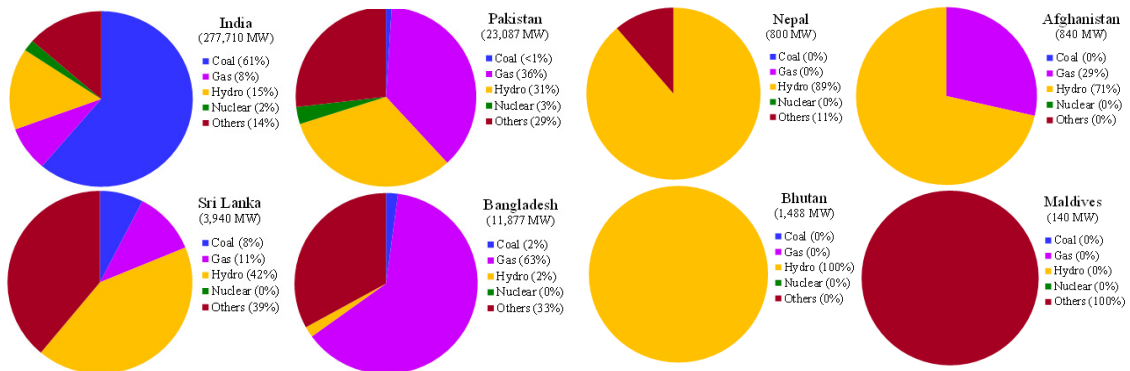


Fig.1. Installed power generation capacity in South Asian based on fuel type, adapted from [2-7, 13-14]

**2.1. Indian Energy Exchange (IEX)**

In South Asia, India is the first nation which has recently established Indian Energy Exchange (IEX). It aims to facilitate in-country and cross-border power and energy trading. Both power producers and buyers can bid live through

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