

SAARC Seminar on Role of Private Sector in Regional Power Trade

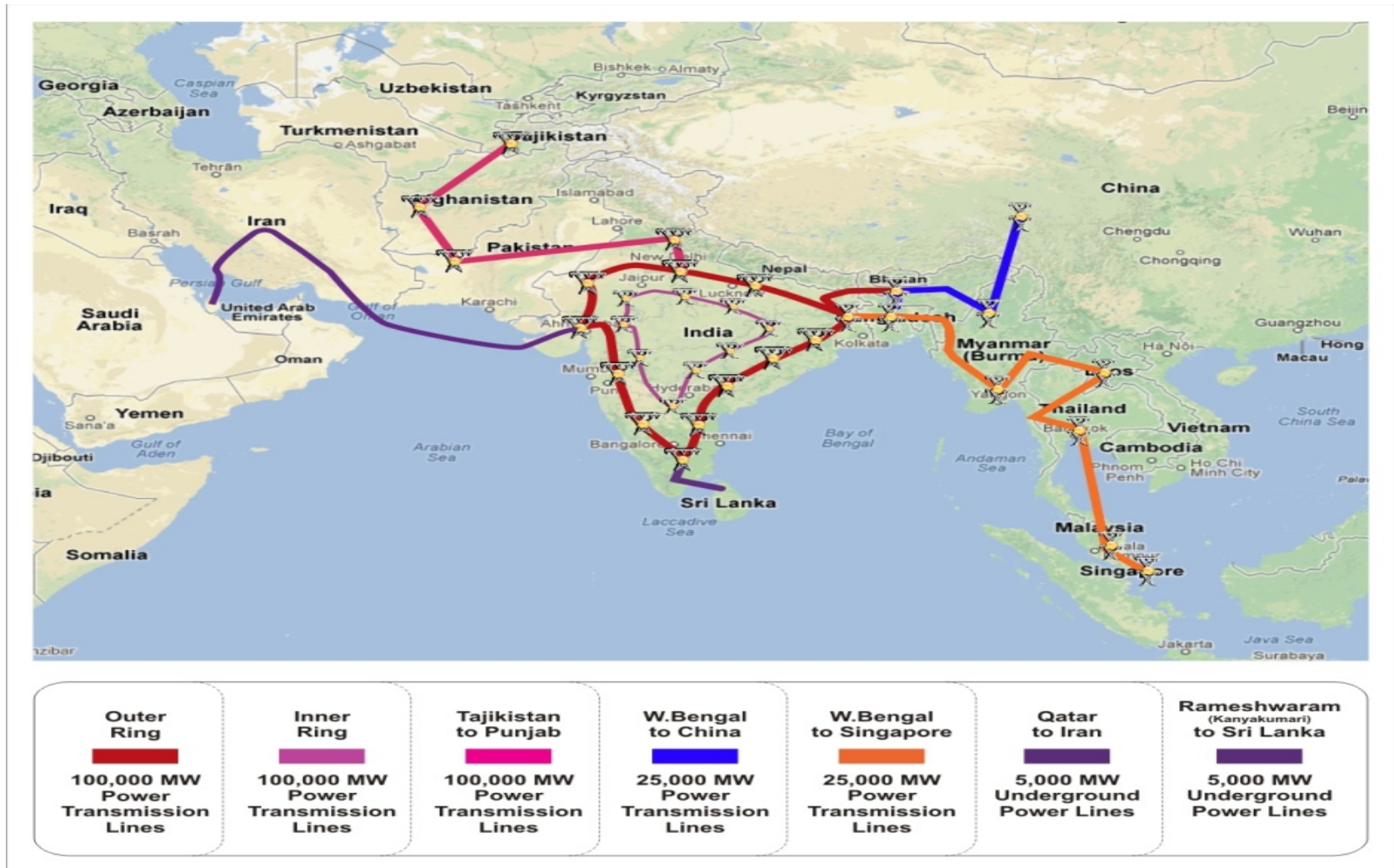
26 – 27 September 2013
The Grand, Vasant Kunj, New Delhi



SAARC Grid: A means to connect Tajikistan to Singapore

The Proposed SAARC Grid and Beyond

Harnessing the potential of transnational power trade in Asia from Tajikistan to Singapore



Co-operation for Energy Security of South Asia

- Rapid **economic development** of South Asian countries not possible without abundant, affordable power
- Nations have **different energy resources**
 - Coal (base load)
 - Hydro (base, peaking)
 - Gas (peaking)
 - Renewable Energy (infirm power)
- and Different **load patterns**
 - seasonal variations
 - time differences
- It is more cost effective for countries to trade power through a common power pool (e.g. Existing Nord Pool, Upcoming West African and East African Power Pools)

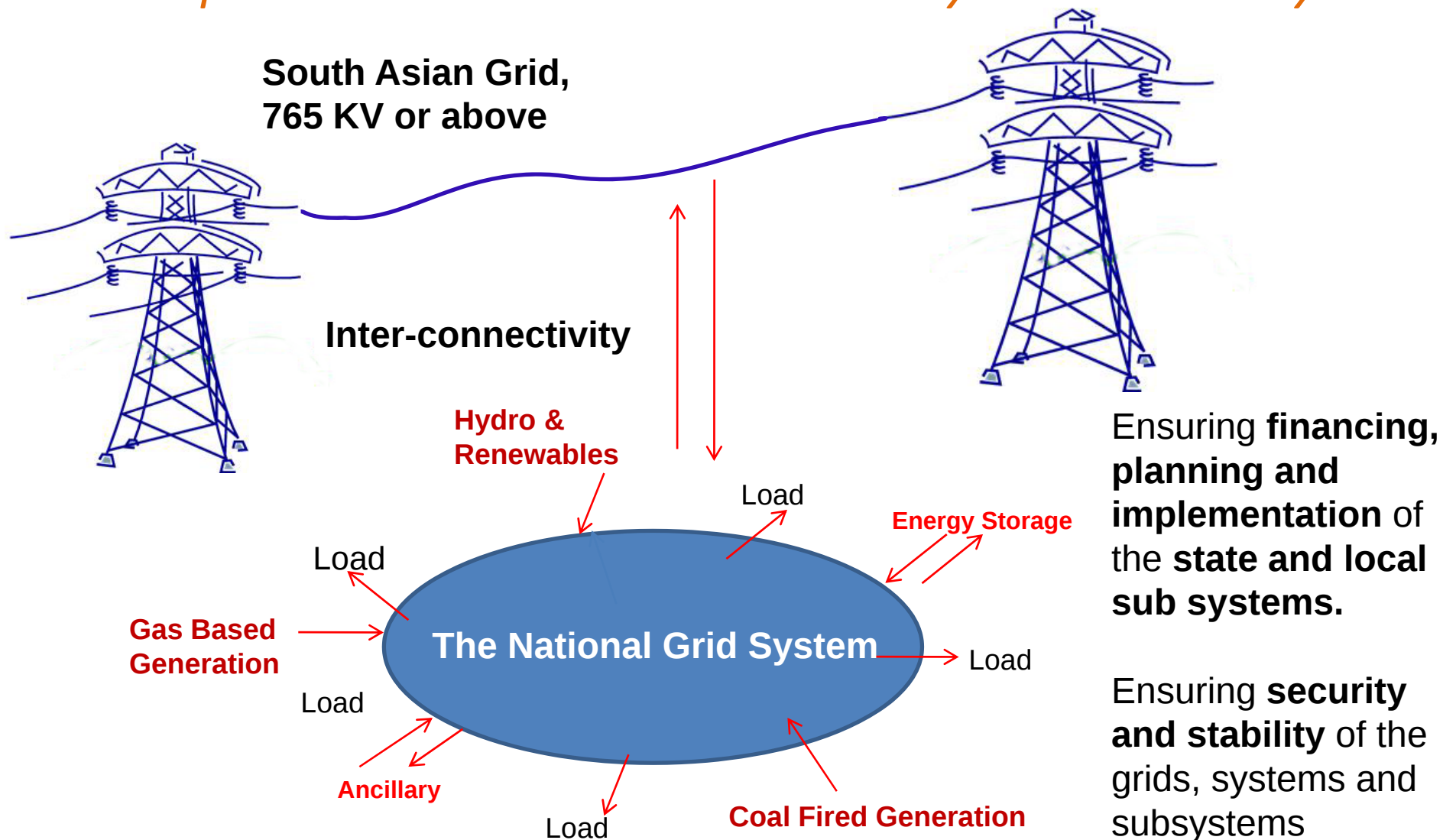


Fostering Energy Security Partnerships & Co-operation through a Pan Asian Power Pool

Asia: What is the potential for cross border power trade?

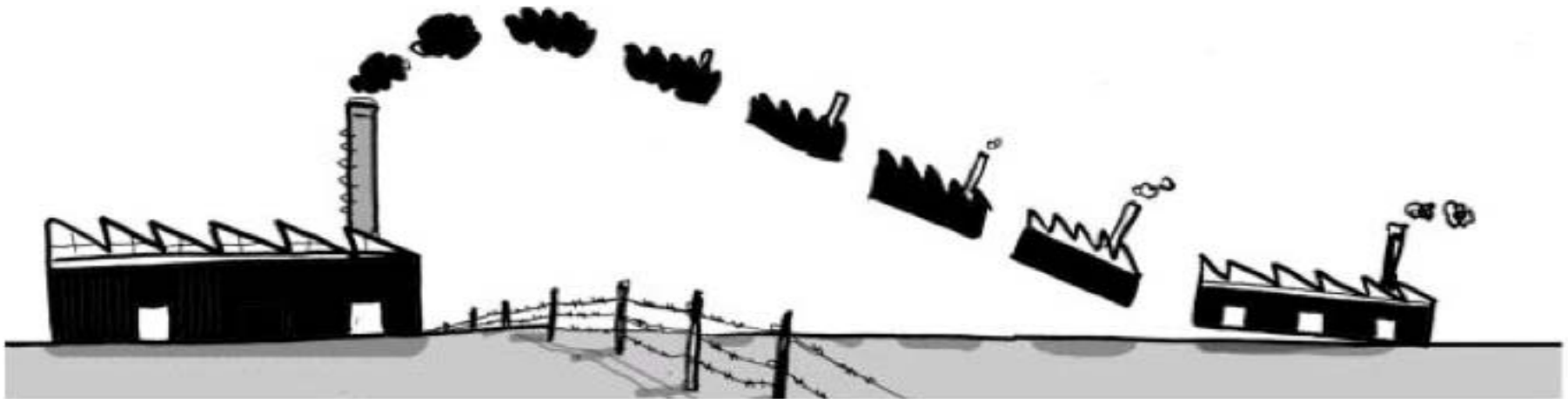
Country	Per Capita Electricity generation (2011) kwh/annum	GDP Growth % 2011	Peak Load	Energy Resources for Power Generation
Tajikistan	2111	7.5	Winter	Coal and Hydro
Afghanistan	10	10.2	Winter	Oil, Natural Gas, Coal
Pakistan	600	3.7	Summer, Winter	Gas , Lignite
India	700	6.6	Summer, Winter	Coal
Bhutan	764	9.7	Winter	Hydro
Nepal	100	4.6	Winter	Hydro
Sri Lanka	500	6.4	Summer	Biomass, wind
Bangladesh	200	6.1	Summer	Gas, Coal
Myanmar	116	6.3	Summer	Hydro
China	2582	7.8	Summer, Winter	Coal, Hydro, Gas
Thailand	2221	6.4	Summer	Natural Gas
Malaysia	374	5.6	Summer	Coal, Renewable Energy
Singapore	8,508	1.3	Summer	Natural Gas
Iran	2,732	-5.4	Summer	Oil and Natural Gas

The Proposed South Asian Power Grid: Systems & Sub Systems



Existing and Upcoming Grid Connectivity

- **Tajikistan - Afghanistan** connectivity is under completion (1st Phase 1,500 MW)
- **Pakistan – India** and **Iran - Pakistan** connectivity are under implementation
- The **India - Bangladesh** connection is ready
- Existing **Bhutan – India** connectivity needs to be expanded
- Existing connectivity between **Nepal and India** is being expanded
- An undersea grid link between **Sri Lanka and India** is under contemplation
- **Myanmar and Thailand** are already connected
- 400-500 MW **Thailand-Malaysia** existing connection
- **Malaysia and Singapore** have plans for expanding their connectivity



Further connectivity required

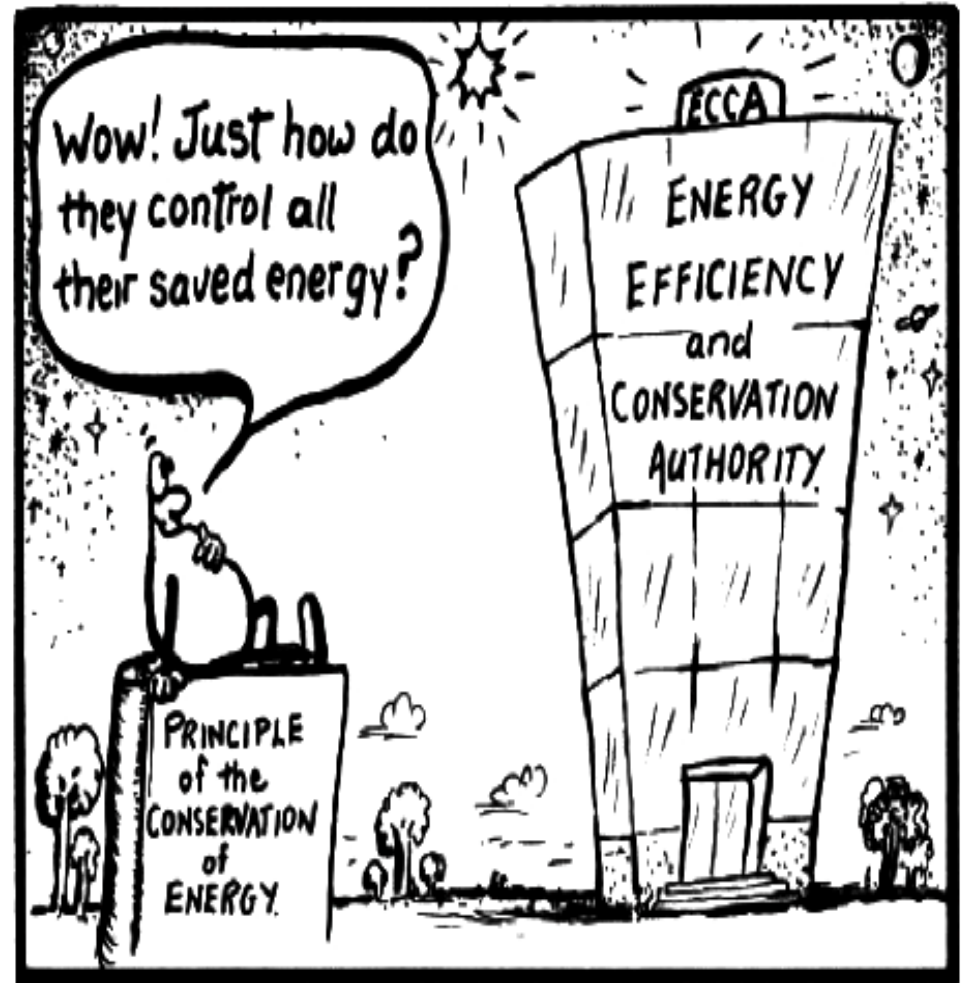
India – Myanmar connectivity is required. Looking at the terrain, the best connectivity could be **through Bangladesh** or with **Manipur/Mizoram** to the closest load points such as Mandalay in **Myanmar**. Further, a spur line from **Myanmar** could connect **China** to the South Asian Grid.



Given its strategic location, India could emerge as the power hub of South Asia.

Types of Cross Border Power Trade

- **Bulk power** - Long, Medium and Short Term
- Meeting **daily and/or seasonal peaking** requirements, especially when these are non-coincidental
- **Ancillary services** (frequency and voltage regulation support, spinning reserves)
- **Emergency** support
- Cross-country and cross-regional transfers where **transit countries** benefit from **wheeling charges**
- Sharing **electricity storage** reserves



Benefits of Cross Border Power Trade

Exploiting **complementarities** and **comparative advantages** in:

- Primary energy endowments
- Resource development costs
- Complementary demand profiles

Larger markets – greater certainty for investors, economies of scale

Optimizing fuel mix to reduce costs, improve energy security and better address **environmental** concerns ;

Manage variability of infirm power (hydro, renewables backed by coal, gas power)

Increased **access to electricity** in importing countries; increased **utilisation of generation** assets; Reduced **cost of supply** for all participants



Creating an enabling environment for private sector participation in implementation and operation of the South Asian Grid

- **Defining the Role of the Private Sector** in Construction, Maintenance and Operation of Trans Border Power Lines
 - **Policy** framework required for clarifying technical and institutional issues
 - **Regulatory** framework, harmonising regulations for cross border power trade
- **Issues in Financing**
 - **Financing private sector projects** for development of the South Asian Power Grid
 - **Financial settlement options** - escrow, back stop guarantees from Governments
 - Managing **currency risks**
 - Setting up an effective **payment security** mechanism
- **Transmission planning**, capacity addition based on SAARC load and generation requirements



Creating an enabling environment for Private Sector Participation in Cross border power trade

- Regulatory Compliance
- Scheduling and coordination
- Energy accounting and settlement; settlement in case of deviation from schedule
- Grid connectivity and transmission charges, congestion charges
- Dispute resolution - appropriate authority for legal recourse and arbitration
- Role of Power Exchanges



Robust operational protocols, sovereign/payment guarantees and timely commercial settlement between generators, discoms, utilities, power traders, power exchanges and consumers are required to ensure the viability of cross border power transactions.

In Conclusion: The emergence of a new Asian energy security paradigm from the Tajikistan to Singapore