Regulation of Cross Border Energy Trade and Regional Power Market

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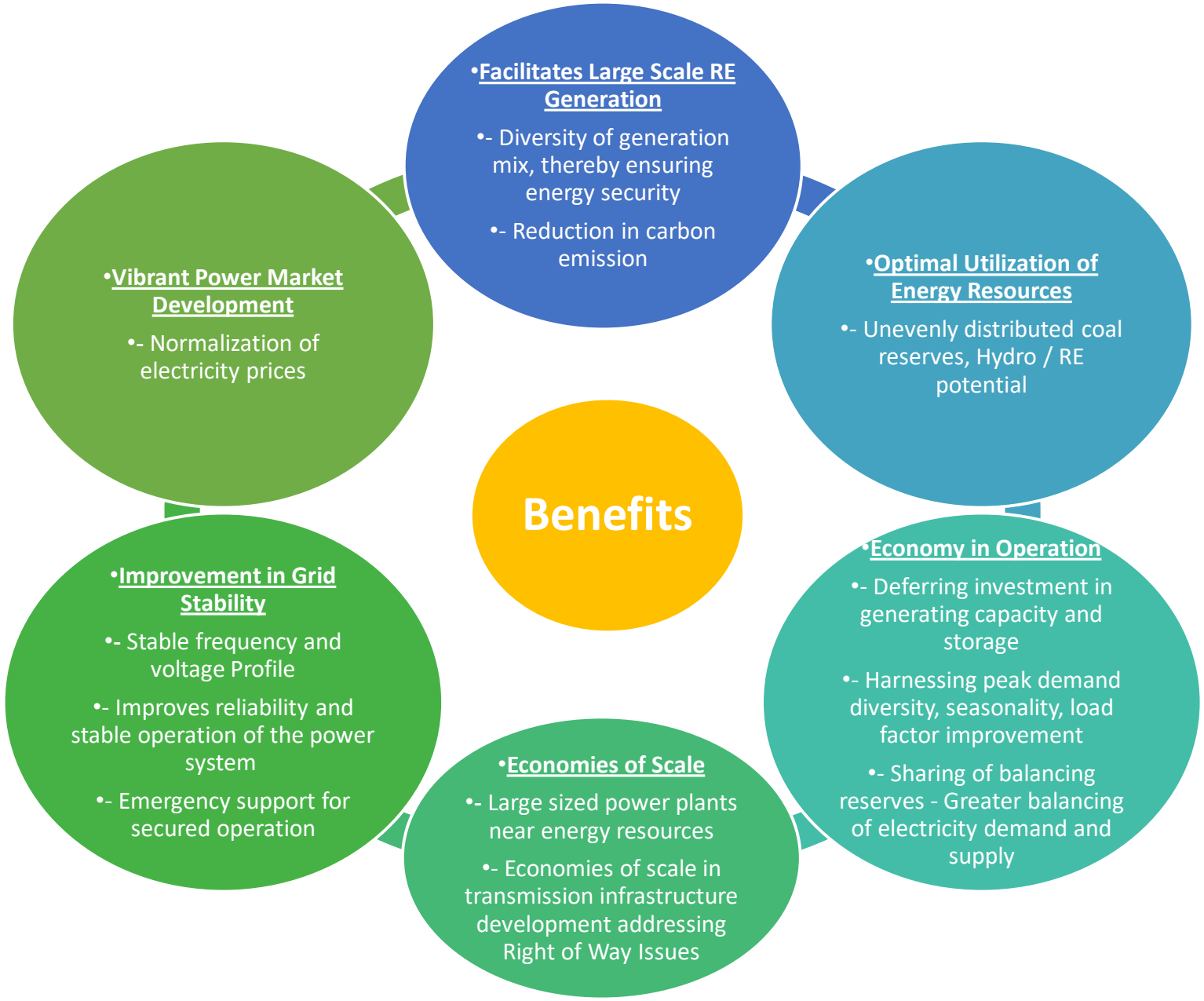
Cross Border Electricity Trade

- Need based
- Win – win for both countries
- Bhutan : Hydro Development supporting the region, Mutual need during deficit situation
- Nepal : To meet the deficit and market to sell surplus , Hydro development, market assess
- Bangladesh : meet the deficit ,
- Europe: Mutual requirement and optimum utilization of resources.

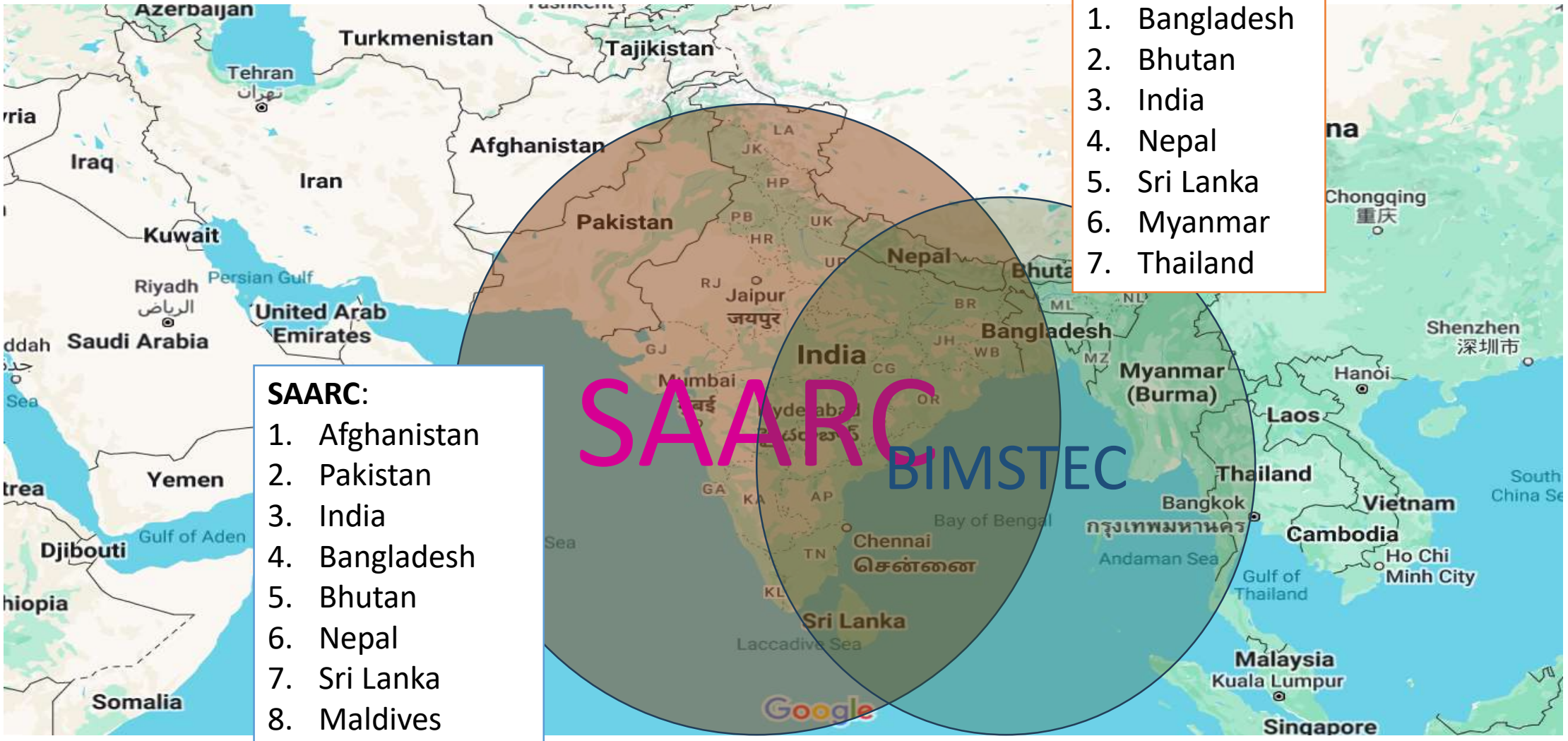
Cross Border Electricity Trade

- Flow of electricity across the border between different jurisdictions.
- Not comparable with international trade in other commodities.
- The peculiarities of electricity generation and transmission, limit the applicability of conventional trade models.
- Electricity is mostly traded over relatively short distances with neighbouring jurisdictions within an integrated electrical transmission grid.
- Two-way in many instances. A jurisdiction may import and export electricity over the course of a year, a single day.

Benefits: Cross-Border Interconnections



India – Largest South Asian Country



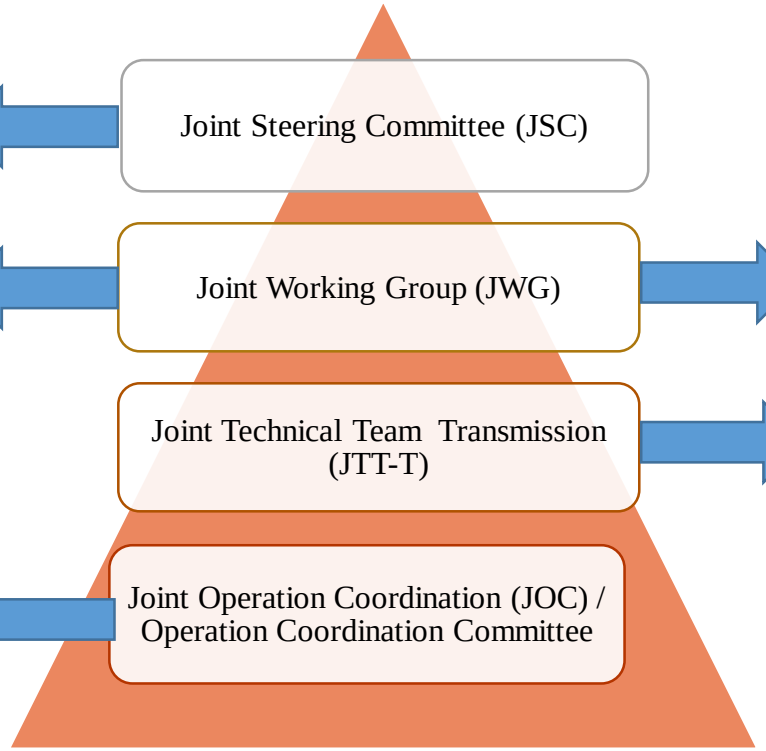
Guidelines on Import/Export (Cross Border) of Electricity

- SAARC countries envisaging the need for cross-border electricity cooperation signed the SAARC Framework Agreement for Energy Cooperation (electricity) on 27/11/2014.
- Govt. of India had issued the "Guidelines on Cross Border Trade of Electricity" on 5th December, 2016
- Govt. of India issued new "Guidelines for Import/Export (Cross Border) of Electricity-2018" on 18th December, 2018 to :
  - Facilitate import/ export of electricity between India and neighbouring countries;
  - Evolve a dynamic and robust electricity infrastructure for import/ export of electricity;
  - Promote transparency, consistency and predictability in regulatory mechanism pertaining to import/ export of electricity in the country;
  - Reliable grid operation and transmission of electricity for import/ export.

Multi Layered Coordination and Communication

Constitution of Joint Steering Committee (JSC) and Joint Working Group (JWG) :

- High-level decision making for electricity cooperation
- First activity – establishment of cross-border link



To discuss and coordinate Planning / Implementation / Monitoring of cross border transmission lines and related matters in power sector cooperation.

To carryout system studies and discuss technical matters related to cross-border links.

- For operation coordination, grid security and reliability.
- Held between system operators bilaterally at least once in a year.

INSTITUTIONAL FRAMEWORK

Guidelines

Designated Authority

Member (PS), CEA

Procedure

- Planning, monitoring and commissioning of transmission lines for import/ export of electricity
- the grid security, safety and operation;
- Approvals for the trade

CERC

Regulations

- Connectivity, access, metering, system operation, payment of charges etc

Nodal Agencies

SNA – Settlement of grid related charges

CTU - long-term access and medium-term open access

NLDC - short-term open access including PX

AGREEMENTS FOR TRADE

BILATERAL AGREEMENTS

- Framework of agreements signed between India and the neighbouring country(ies)
- Mutual agreements between Indian Entity(ies) and Entity(ies) of the neighbouring country(ies)

TRIPARTITE AGREEMENTS

- For cross border trade of electricity across India
- Bilateral agreements signed between Government of India and the Government of respective neighbouring country(ies) of the participating Entity(ies).
- Tripartite agreement among participating Entities

ELIGIBILITY AND APPROVALS

IMPORT BY INDIA

- **Other than under G2G agreements**
  - Import by Indian entities
  - From the generation projects located in neighbouring country(ies)
  - Directly or through Government or a Government Company or a licensed trader of that country
  - Generation project(s) should have the permission to export power to India from Government of the host country.
  - With Approval of the Designated Authority;
- **Under G2G agreements**
  - Government of India may designate an Entity for import of power.
  - Approval from DA not required

EXPORT BY INDIA

- **Other than under G2G agreements**
  - Export by Indian Generating Companies/ Distribution Companies
  - electricity generated by coal or gas or renewable energy or hydropower
  - In case of electricity generated from coal/gas based generating plants, electricity should be generated utilizing imported coal/gas or spot e-auction coal or coal obtained from commercial mining; or from any other source as specified by Government of India from time to time
  - directly or through trading licensee(s) of India
  - With Approval of the Designated Authority;
- **Under G2G agreements**
  - Government of India may designate an Entity for export of power.
  - Approval from DA not required

Trade in Indian Power Exchanges

Any Indian power trader may, after obtaining **approval from the Designated Authority**, trade in Indian Power Exchanges on behalf of any Entity of neighbouring country, for specified quantum as provided in the Approval and complying with CERC Regulations. Restrictions of imported coal/gas shall not be applicable for collective transactions through Power Exchange(s) in India.

TARIFF

IMPORT BY INDIA

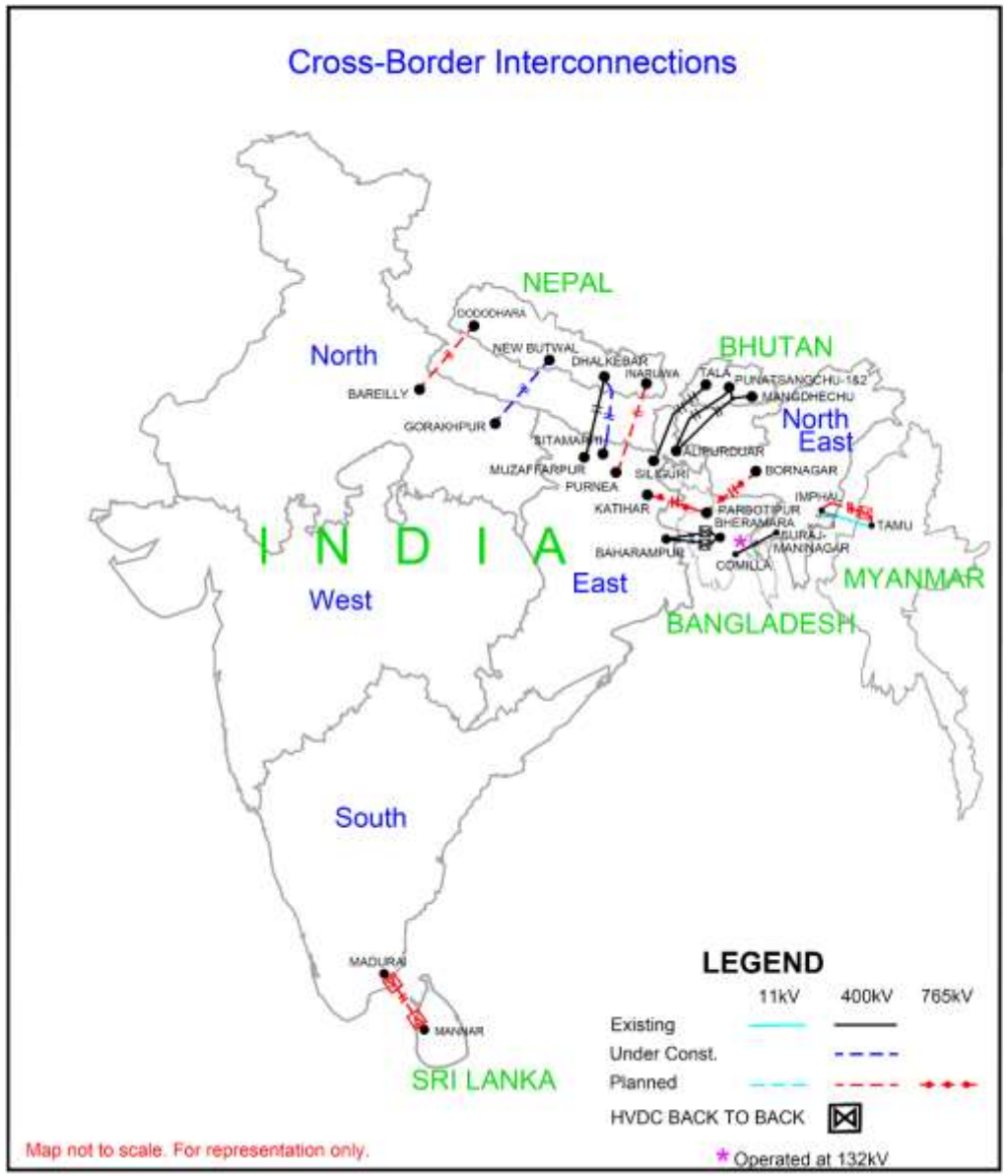
- A process of competitive bidding as per the Tariff Policy of India or through mutual agreement. In case of hydro projects, the tariff may be determined by CERC, if approached by the generator through the Government of the neighbouring country and agreed by the Indian entities
- Government to Government negotiations including under Inter Government Agreement (IGA), the tariff for import of electricity is mutually agreed and the same is final. Till the expiry of the agreement or as may be decided by the two countries
- After expiry of contracts/agreements, can be determined through any of the above clause

EXPORT BY INDIA

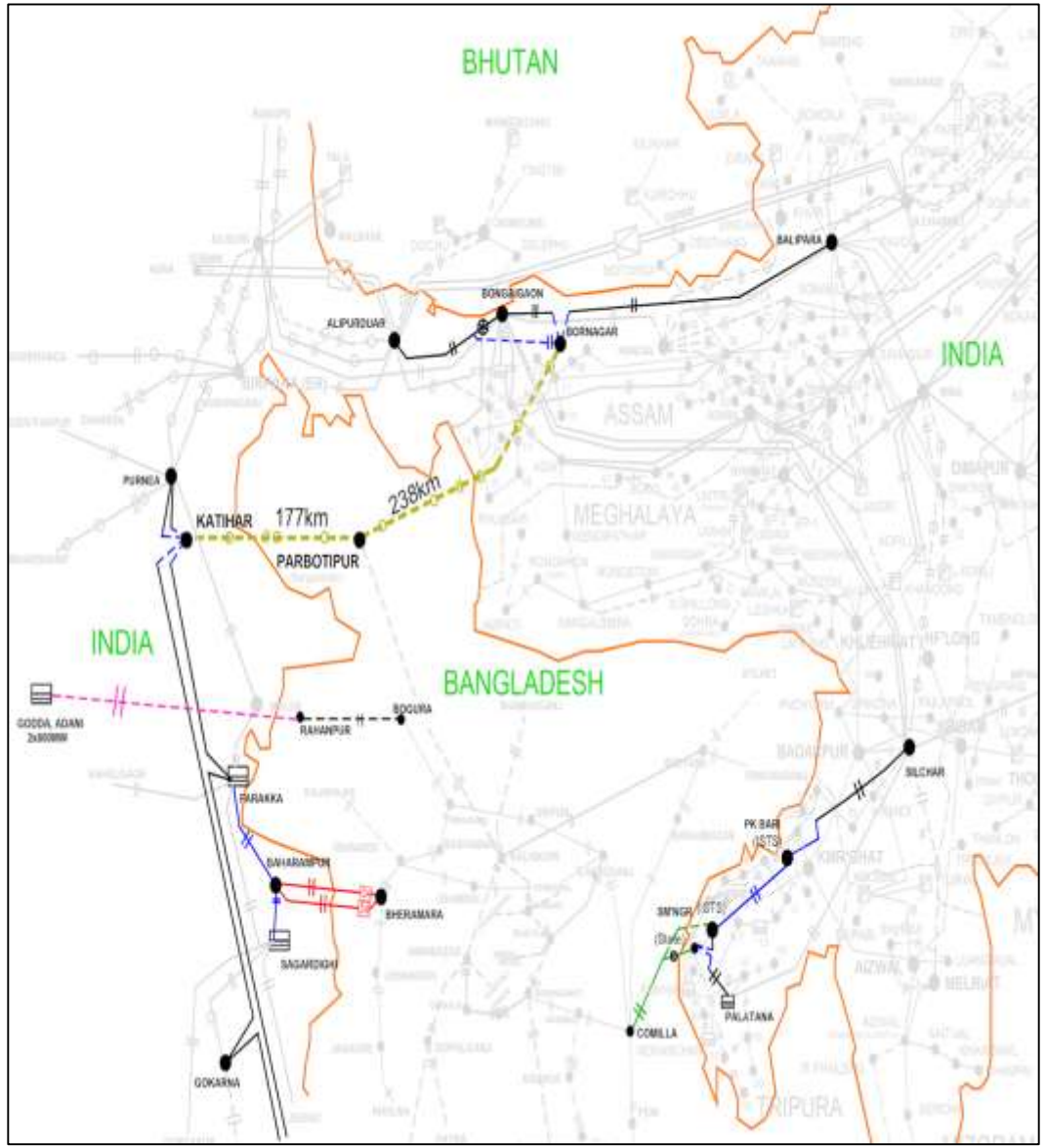
- As mutually agreed or based on competitive bidding, subject to payment of the charges as applicable for transmission/ wheeling of electricity through the Indian grid.
- Government to Government negotiations including under Inter Government Agreement (IGA), the tariff for import of electricity is mutually agreed and the same is final. Till the expiry of the agreement or as may be decided by the two countries
- After expiry of contracts/agreements, can be determined through any of the above clause

Interconnections and Ongoing transactions

Cross Border Interconnections with India



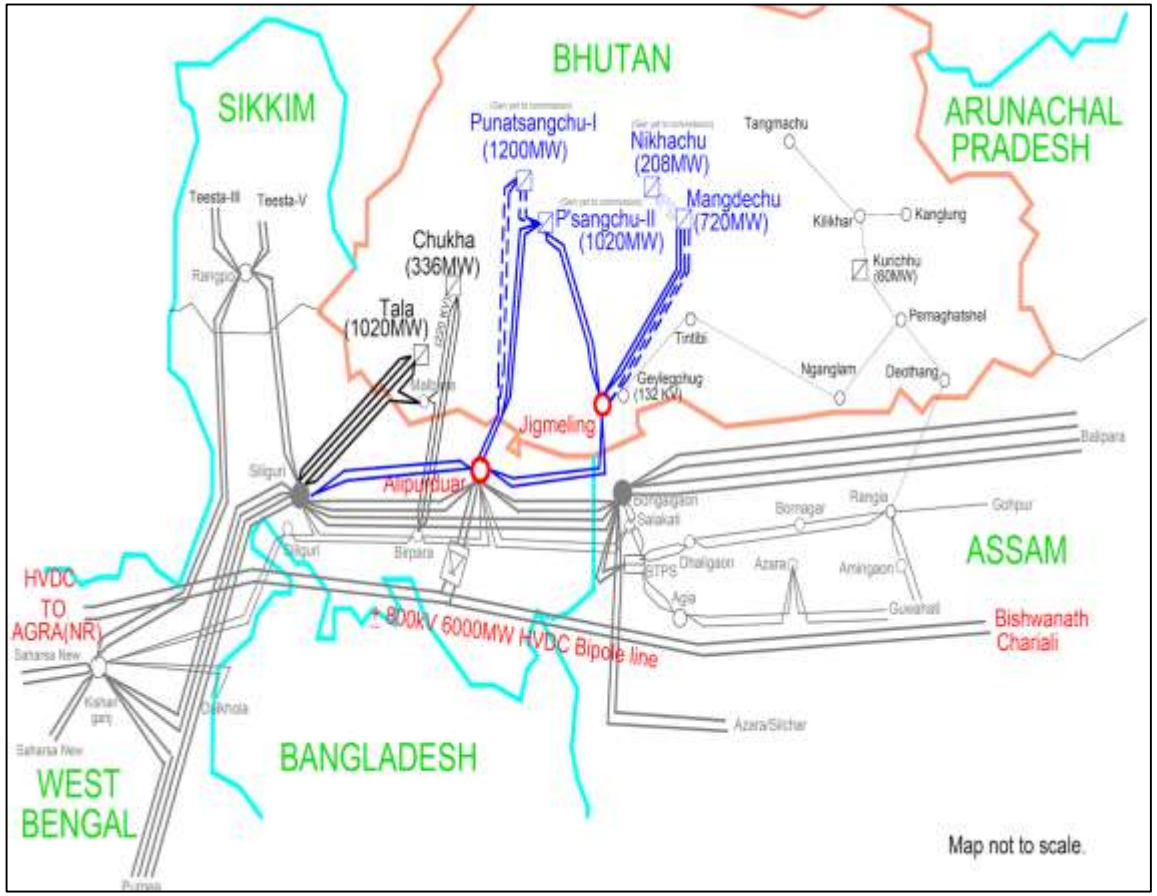
INDIA – BANGLADESH



- **Existing Interconnections**
  - Baharampur (India) – Bheramara (Bangladesh) 400 kV D/c line and 2x500 MW HVDC back-to-back terminal at Bheramara
  - Surjyamaninagar (India) - Cumilla (Bangladesh)
  - Godda STPS, Adani (India) – Rahanpur/Bogra 400 kV D/c dedicated line
  - Implementation of the 765kV D/C Katihar (India) – Parbotipur (Bangladesh) – Bornagar (India) cross border link has been agreed.
- **Existing Electricity Trade** :
  - Behrampur – Bheramara link
    - NTPC generating stations – 250 MW
    - DVC (NVVN) – 300 MW
    - Sembcorp Energy (PTC) – 200 MW
    - Sembcorp Energy India Limited – 250 MW
  - From Indian State grids
    - Tripura (through NVVN) – 160 MW
  - Godda STPS (1600 MW)

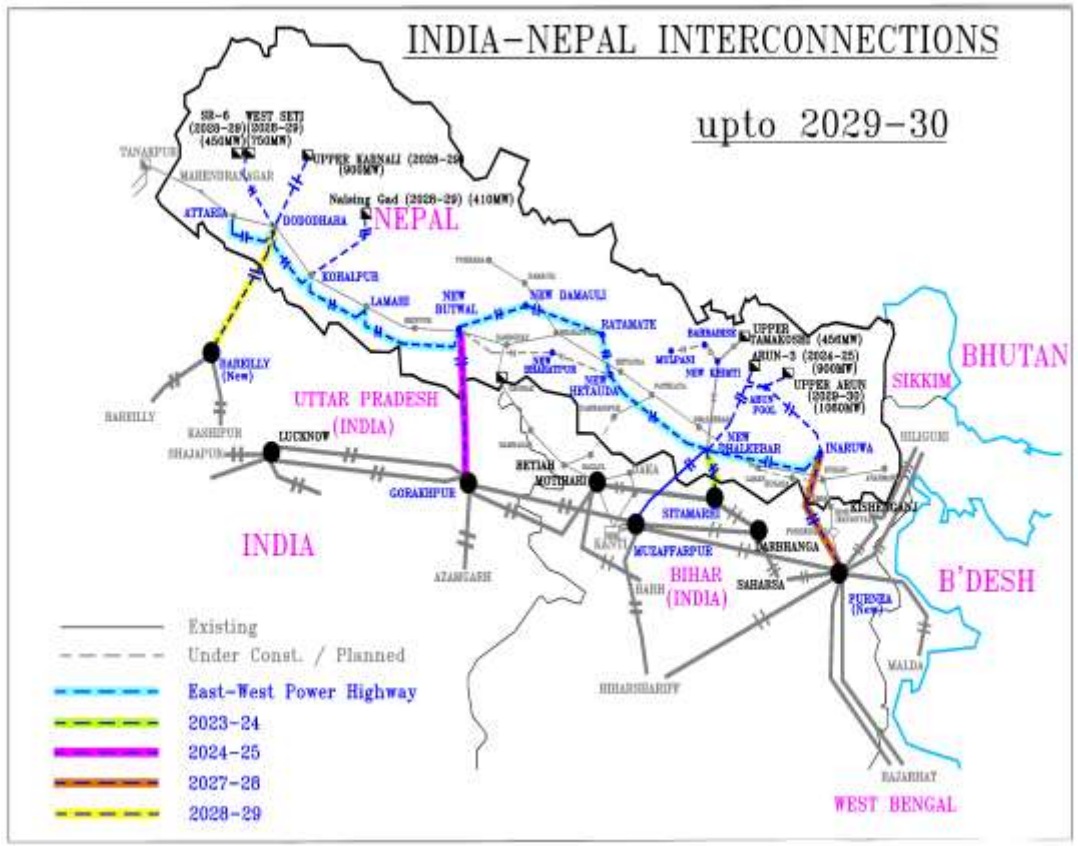
INDIA – BHUTAN

- Bulk power generated in Bhutan is being Imported by India through 400 kV, 220 kV and 132 kV lines.
- Presently, about 2000 MW power from the existing hydro projects in Bhutan is being imported to India.
- Under G-2-G mode
  - Tala HEP (1020 MW)
  - Chukha HEP (336 MW)
  - Kurichhu HEP (60 MW)
  - Mangdechhu HEP (720 MW)
  - Punatsangchu-II (1020MW)
- Under bilateral agreement
  - Dagachhu HEP (186 MW)
- Further, Punatsangchu-I (1200MW) HEP is under construction
- Bhutan imports power through Indian Power Exchange(s) during winter months.
- Bhutan also exports power in the Indian power exchanges

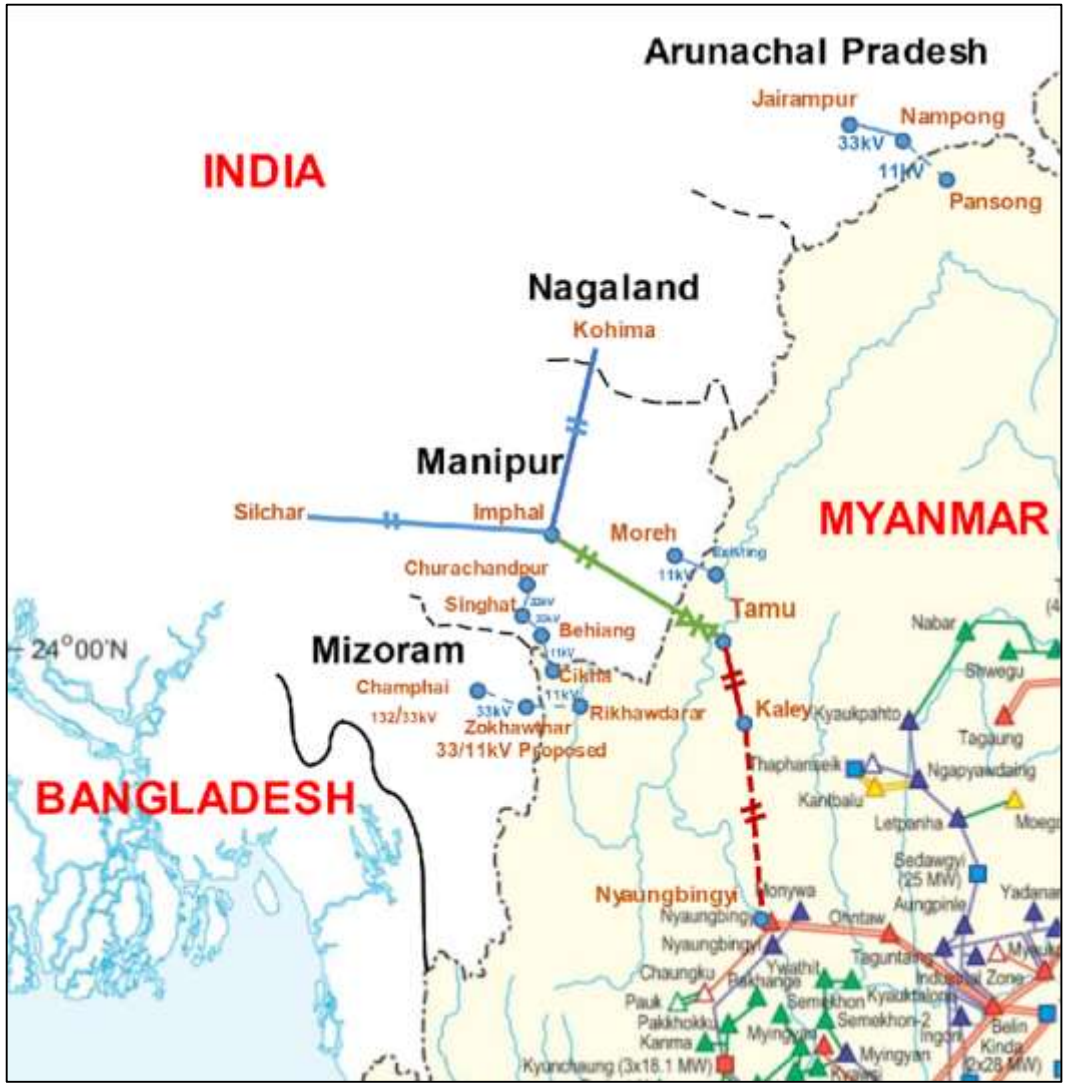


INDIA – NEPAL

- Power is being exported/imported to/from Nepal through 11kV, 33kV,132 kV and 400 kV lines.
- For transfer of bulk power;
  a) Dhalkebar (Nepal) - Muzaffarpur (India) 400 kV D/C transmission line
  b) Dhalkebar (Nepal) – Sitamarhi (India) 400kV D/c (Quad Moose) line and Gorakhpur – New Butwal 400 kV D/c (Quad) line are under implementation.
  c) Purnea (New) – Inaruwa 400 kV D/c (Quad) and Bareilly New – Dododhara 400 kV D/c (Quad) have been planned.
- Nepal import power through bilateral contracts and through Indian Power Exchange(s).
- Nepal also export power to India through Indian Power Exchange(s)



INDIA – MYANMAR



- About 3 MW power is being supplied to Tamu (Myanmar) from Moreh (Manipur) through 11 kV line between the two countries.
- Imphal (India) – Tamu (Myanmar) 400 kV transmission line with 2x500 MW HVDC Back to Back Terminal at Tamu has been agreed.

Proposed interconnection with Sri Lanka

- 2 x 500 MW India – Sri Lanka HVDC interconnection is under discussion.

One Sun, One World, One Grid

- The idea for the One Sun One World One Grid (OSOWOG) initiative was put forth by the Hon'ble Prime Minister of India Shri Narendra Modi, at the First Assembly of the ISA in October 2018.
- At the COP-26 climate summit in Glasgow, 'Greening the Grid Initiative One Sun One World One Grid' (GGI-OSOWOG) was jointly launched by India and UK.
- The sun never sets – every hour, half the planet is bathed in sunshine. Harnessing energy from sun, wind and water across borders, facilitates generation of clean energy enough to meet the needs of everyone on the earth.
- Cross-border exchange of clean energy has already started through bilateral and regional arrangements in various regions. These efforts need to be synergized and supplemented by *establishing inter-connected global grid*.

More Interconnections under discussion

- India – UAE
- India – Saudi Arabia
- India – Singapore
- India – Maldives

Deregulation and Reducing Litigation in Power Sector

Key issues in power sector leading to litigation

- Delay in Tariff determination /true-up and related disputes
- Tariff determination, PPA enforcement and contractual issues
- Change in Law claims & Force Measure claims
- GNA/connectivity/Grid code related issues

Delay in Tariff determination/ true-up and related disputes

- **Manual tariff filings and hearings(ERC)**: Tariff filings are largely manual, supported by voluminous documentation and hearings. Manual processes increase discretion, delay, and scope for disputes.
- **Transmission tariffs and licensing**: Transmission tariff determination and licensing involve multiple petitions and approvals. Processes are repetitive despite being largely standardised
- **Normative Tariff Framework:** There is no comprehensive framework for formula-based, self-applicable tariffs.
- **Disagreements** over the interpretation and application of regulatory principles and the calculation of actual costs.
- **True-up related disputes** are due to reconciling the difference between the approved (ex-ante) costs and the actual (ex-post) costs incurred by the utility (Power Purchase Cost (PPC) Variations, Aggregate Technical & Commercial (AT&C) Losses.

Tariff determination, PPA enforcement & contractual issues

1. **Annual Revenue Requirement (ARR) related Disputes**

- Claimed amounts either not approved or significant reduction of the claimed ARR by SERC, often leads the affected entities to appeal the Commission's order to APTEL.
- **Lack of standardisation in ARR computation**: ARR determination methodologies are largely left to individual State Commissions resulting in significant variation across States leads to inconsistency, disputes, and regulatory uncertainty.

2. **Power Purchase Agreement (PPA) related issues**

- Key problems include performance discrepancies
- Involves interpretation of the provisions of the PPA to be read with the regulations and the Act.

3. **Billing Disputes:**

➢ Consumer/ Generator vs. DISCOM Disputes

Change in Law claims & Force Measure claims

- **Absence of a standard CIL repository**: There is no authoritative, publicly available list of settled CIL issues. Absence of a central authoritative classification of CIL events results in similar petitions in multiple states. Petitioners continue to file claims on settled grounds.
- **Force Majeure and CIL technical examination**: The Commission undertakes detailed technical-legal examination of Force Majeure and complex CIL claims. Such examination is time-consuming and diverts regulatory focus.
- **Post-PPA regulatory changes** CIL disputes centres on the increased costs incurred by generators due to post-PPA regulatory changes. Generators seek regulatory approval for compensation under the "Change in Law" clause of the PPA.
- **Interpretation issues:** Conflicting interpretation across SERCs on government policy changes (GST, coal policy, FGD norms, Imported coal pricing, etc.).

GNA/connectivity/Grid code related issues

- Renewable energy project growth is outpacing the transmission network's capacity
- The Inter-State Transmission Network is complemented by the Intra-State Transmission Network- Timeline mismatching.
- Connectivity for solar & Non-Solar Hours
- Dispute arises due to full GNA charges by Untied/Merchant Capacity
- Non-adherence of timeline of project commissioning (SCOD).

Transparency and ease of disposal of tariff petitions

- **Portal based (e-filing) Tariff/true-up filings** with automated scrutiny & timelines.
- **Uniform ARR computation frameworks:** may be notified through Rules.
- CERC and FOR to recommend a detailed NTF within six months
- Portal for determination of Generation tariff/ transmission tariff/ retail tariff to be developed in 6-12 months
- Same portal to used for filing of ARR/ stakeholders comments / checks by Commission / finalisation of initial tariff.
- The same portal be also used for true up petition filing and finalisation as well.
- Technical parameters specified by technical body be adopted while determination of tariff
- ERCs may seek technical advice from Technical bodies on technical matters.

Ease of doing business

License issuance to be made automatic.

- **Introduction of a digital portal** for issuance/revocation/reissuance of
  - transmission license.
  - License to traders
  - License to Distribution licensee
- All parameters be prespecified and documents uploaded on the website

Standardisation

- **Standardisation of CIL**
- **Provision of Standard list of CIL cases:** Publish and update a standard CIL list every six months. Only cases outside the standard list needs to be filed. Petitioners to certify that their claims fall outside the standard list.
- **Restrict petitions -**to truly exceptional cases such as major RCM, non-standard Change in Law, or Force Majeure events. Only cases beyond a certain financial limit to be allowed to file petition, similarly for filing appeal.
- **Clubbing of the cases**: Provision to be made in Rules/ Regulations for clubbing of the cases at regulatory commissions.
- **Constitute a standing expert sub-committee:** comprising CEA, CERC, and MoP to provide non-binding recommendations on only complex CIL cases to the Govt.
- Clarity about CIL at the time of issuance of the order itself. Policy change must mention whether it is CIL or not.
- **Time line of Disposal:** Deadline for disposal may be mandated in the Act for CERC/SERCs.

Faster resolution though DRC etc

- **Provision of Dispute Resolution Committee**: MoP may constitute CCIE-like expert committees for the thermal, renewable, transmission, and distribution sectors to facilitate faster and technically robust resolution of sector-specific disputes.
- Adoption of **institutional arbitration/Mediation** through empaneled reputed Arbitrator/Mediator.

Reducing load of ERC

Technical matters to be handled by expert organizations:

- Connectivity
- DSM
- Resource adequacy planning
- Cyber security matters

Uniform Grid Code

- Indian Grid code
- State Grid Code

- Regional Grid Code

- Can we have one Grid Code (Law of Physics does not change)

Regional Power Market

Energy Market :

- Power Exchanges (IEX/ PXIL/ HPX)
- OTC platforms (NAME / GNA)

Futures and derivatives

- MCX
- NSE

Capacity Market :

- Requirement of ensuring adequacy of Capacity in the system
- Capacity can be traded for longer period

Do we require a separate regional power market ???

Are we meeting the objectives ???

Fragmented market vrs large market

Thank You