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Annexure-II

South Asia Regional Initiative for Energy Integration (SARI/EI)

Overview of South Asian Power Sector, SARI/EI Program activities

First Meeting of SAFIR Working Group on
"Regulatory Cooperation to Facilitate Knowledge sharing, addressing Cross cutting Energy/Electricity Regulatory Issues and Capacity Building in South Asia"
15th and 16th May, 2018, Hotel Taj Samudra, Colombo, Sri Lanka

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Contents of Presentation

- Overview of South Asia Power Sector.
- Overview of SARI/EI Program.
- Brief overview of Research Studies carried out under SARI/EI Program.
- South Asian Power Sector-Capacity and Investment Requirements by 2040.
- Risk and Challenges in CBET
- Need for Conducive Policy and Regulatory Framework for Facilitating Investment in the Region
- Key Milestones/Impact of SARI/EI Program.
- Institutionalization of Process of CBET and Power Sector Integration in South Asia
- SAR/EI Program Synthesis
- Way forward

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Overview of South Asia Power Sector

Overview of South Asia Power Sector

South Asian Power Sector. Total Installed capacity of around 3,95,069 MW

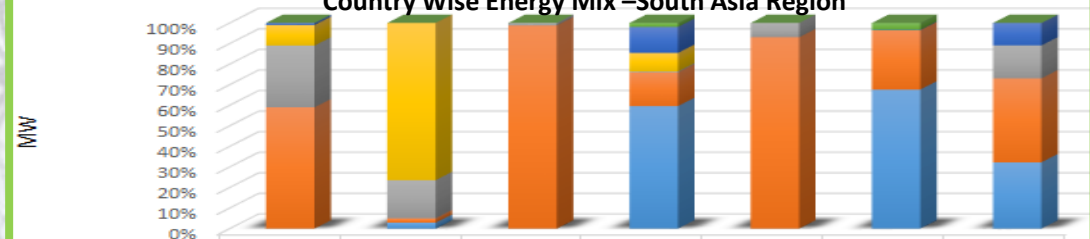
- **Afghanistan : Small Power system(1341 MW), Electricity Imports high, Hydro Dominated.**
- **Bhutan: Small Power system (1614 mw) Hydro dominated, Surplus Hydro , Exporting to India**
- **Bangladesh : Gas Dominated, Resource Constraints , Imports Electricity from India and in future will remain as a Importing Country.**
- **India: Very Large Power System, Coal Dominated, reducing deficits, long terms electricity demand are huge and potential large market, Electricity importing and exporting nation.**
- **Nepal : very Small Power system (765 MW), Hydro based, very high deficits, Importing Electricity from India , Potential exporter and importer of electricity.**
- **Sri Lanka: hydro dominated but the fuel mix is changing, no trading at present, High peak demand.**

Overall SA region is a power hungry region and per capita consumption is very low. Large part of population remains without access to electricity.

Country	Installed Capacity (MW)
Afghanistan	1341
Bhutan	1,614
Bangladesh	16,046
India	344002
Nepal	765
Sri Lanka	4050
Pakistan	24,829
Total	395,069

Source : Compiled form various sources PGCB, DGPC,CEA,Annual Report NEA, Status of Industry Report NEPRA, Task Force 1 Report IRADe Report on CBET in South Asia: Challenges and investment oppoutinuties, etc.

Country Wise Energy Mix –South Asia Region



	Afghanistan	Bangladesh	Bhutan	India	Nepal	Pakistan	SriLanka
Nuclear (MW)	0%	0%	0%	2%	0%	3%	0%
Renewable (MW)	1%	0%	0%	13%	0%	0%	11%
Gas (MW)	10%	76%	0%	9%	0%	0%	0%
Oil (MW)	30%	19%	1%	0%	7%	0%	16%
Hydro (MW)	59%	2%	99%	16%	93%	29%	41%
Coal (MW)	0%	3%	0%	60%	0%	68%	32%

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Resource Potential: Hydro Potential :350 GW !

- ✓ Vast potential of hydro power:350 GW
- ✓ Bhutan, Nepal, Pakistan, India: 30,83, 59, 150 GW respectively.
- ✓ Nepal and Bhutan can build export oriented hydro power plants
- ✓ Significant Coal deposits in India and Pakistan.
- ✓ Coal deposits in Bangladesh yet to be exploited.
- ✓ In addition to the conventional energy resources, there is huge renewable energy resources like solar and wind.

Country	Coal (million tons)	Oil (million barrels)	Natural Gas (trillion cubic feet)	Biomass (million tons)	Hydro (GW)
Afghanistan	440	NA	15	18–27	25
Bhutan	2	0	0	26.6	30
Bangladesh	884	12	8	0.08	0.33
India	90,085	5,700	39	139	150
Maldives	0	0	0	0.06	0
Nepal	NA	0	0	27.04	83
Pakistan	17,550	324	33	NA	59
Sri Lanka	NA	150	0	12	2
Total	108,961	5,906	95	223	349.33

Source: SAARC Secretariat (2010) for Bangladesh, Bhutan, India, Nepal, Sri Lanka; CWC (2005) for Indian States and WAPDA (2011) for Pakistan

Renewables	Bangladesh	India	Nepal	Bhutan	Pakistan	Sri Lanka
Solar Power (Kwh/sq. m per day)	3.8 - 6.5	4 - 7	3.6 - 6.2	2.5 - 5	5.3	NA
Wind (MW)	Very limited potential	151,918	3,000	4,825	24,000	25,000MW

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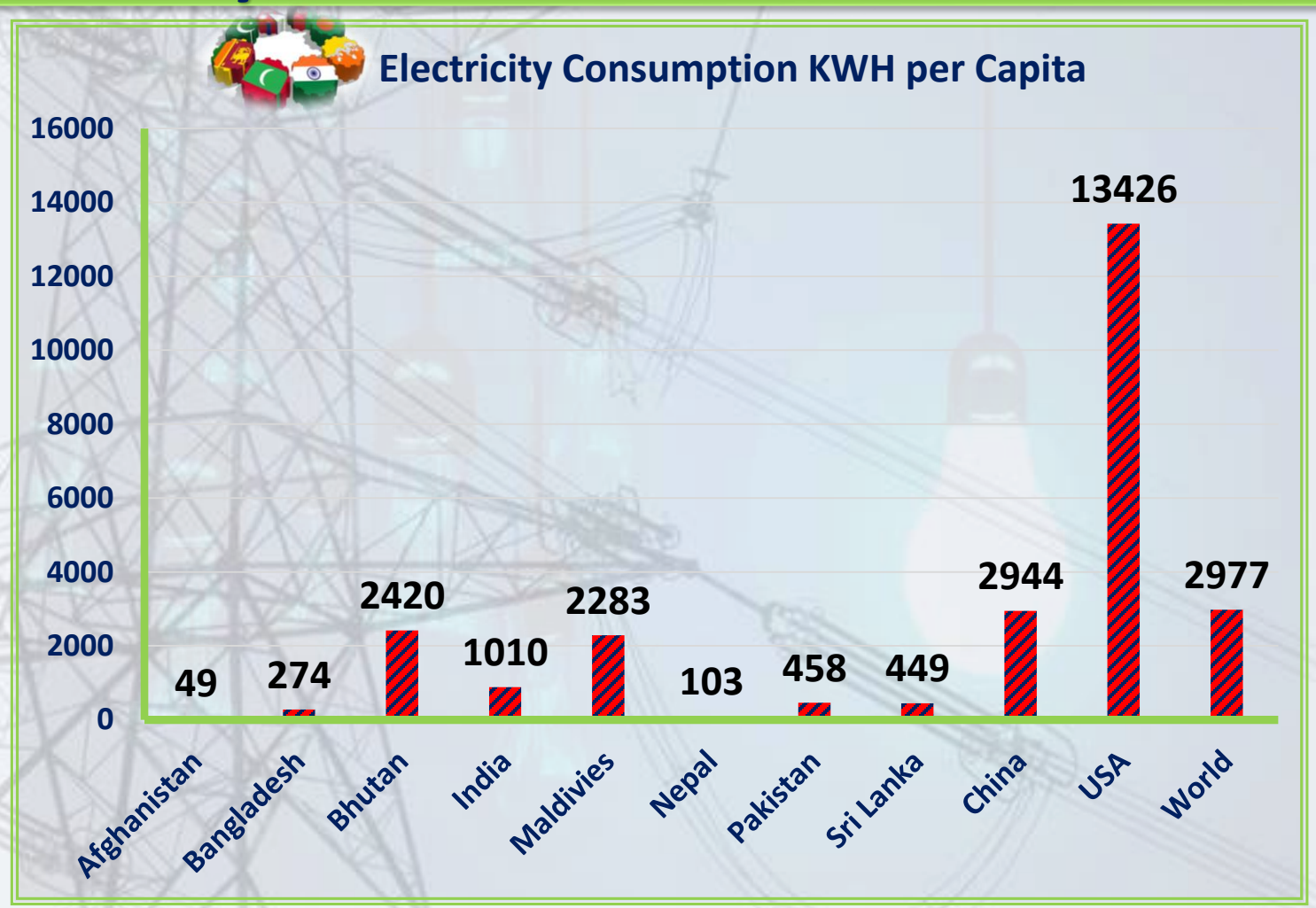
Per Capita Electricity Consumption and Key Drivers for Cross Border Electricity Trade

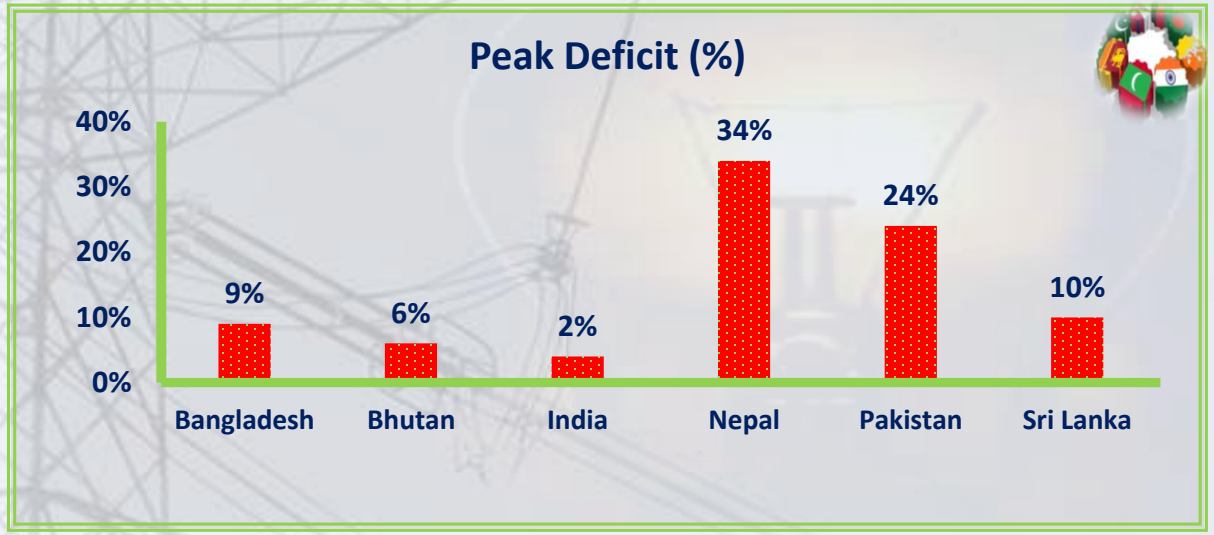
Country/ Region	Electricity Use kWh/capita/yr
SAARC	576
USA	13, 426
EU	6,592
BRAZIL	2,206
MALAYASIA	3,614
CHINA	2,944
WORLD	2,977

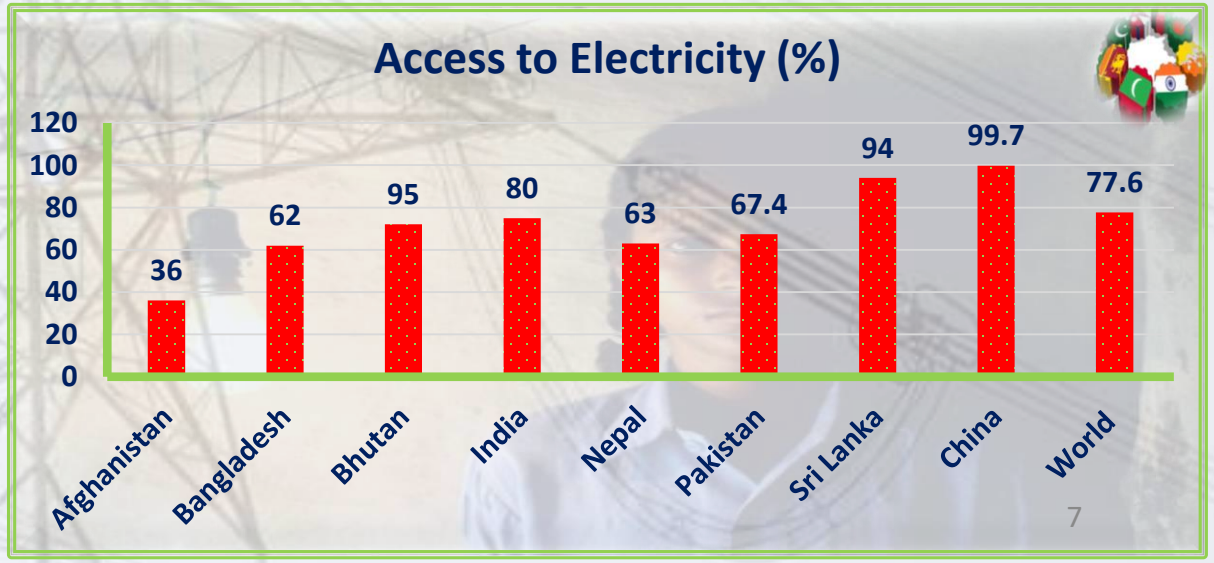
Source:SAARC Energy Centre



Key Drivers for CBET

- ✓ Energy and Peak Shortages.
- ✓ Low per Capita electricity consumptions
- ✓ Poor access to electricity.
- ✓ Resource Crunch (In Bangladesh)
- ✓ Optimal utilization of energy resources.
- ✓ Availability of Prices on Market Based.
- ✓ Enhancing Liquidity
- ✓ Economic benefits.





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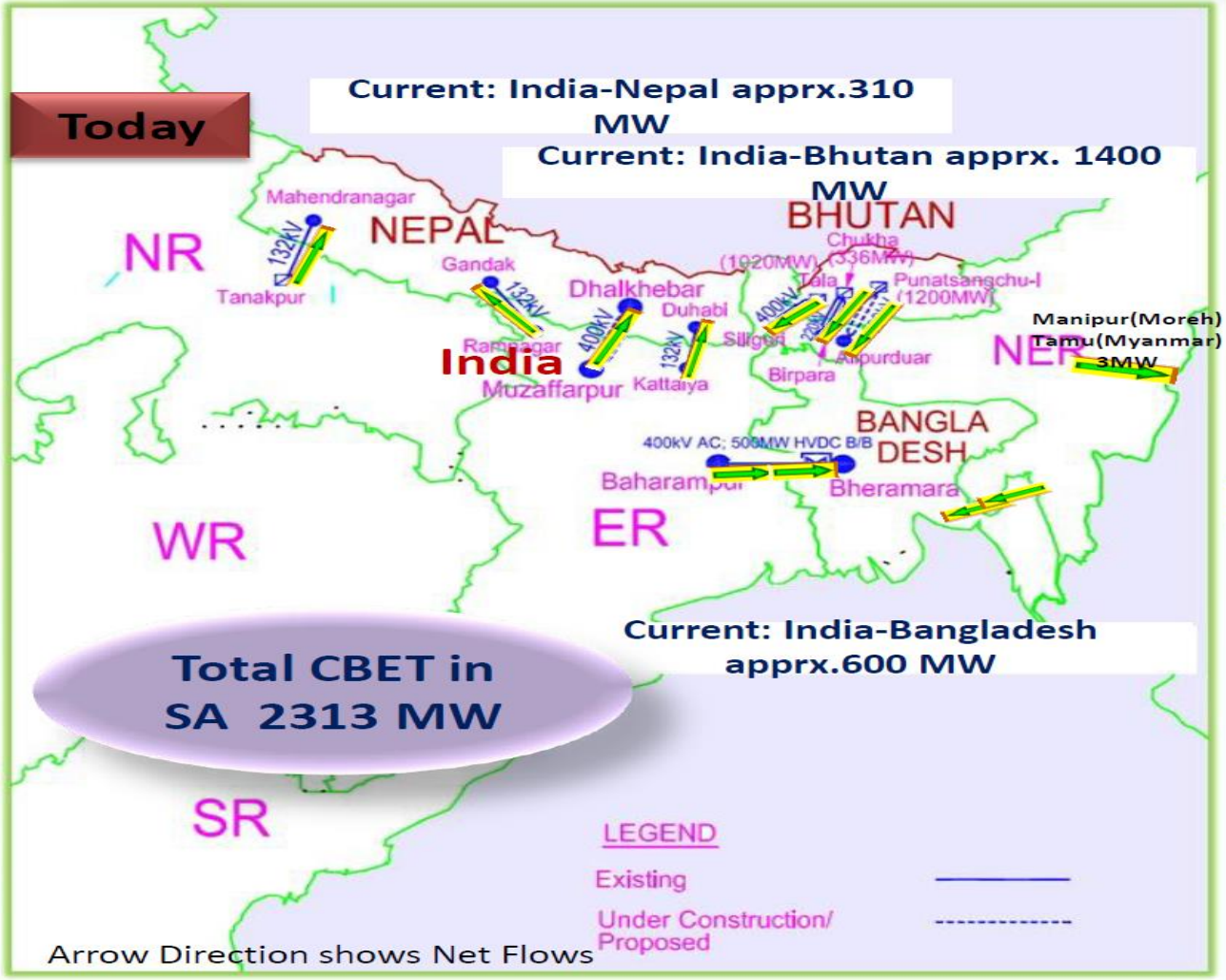
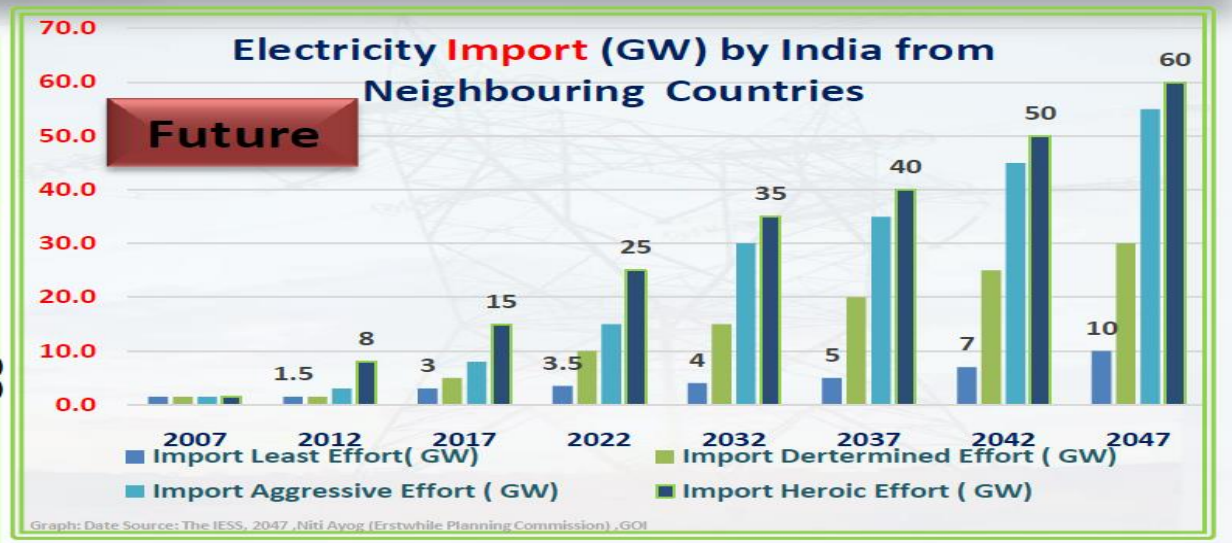
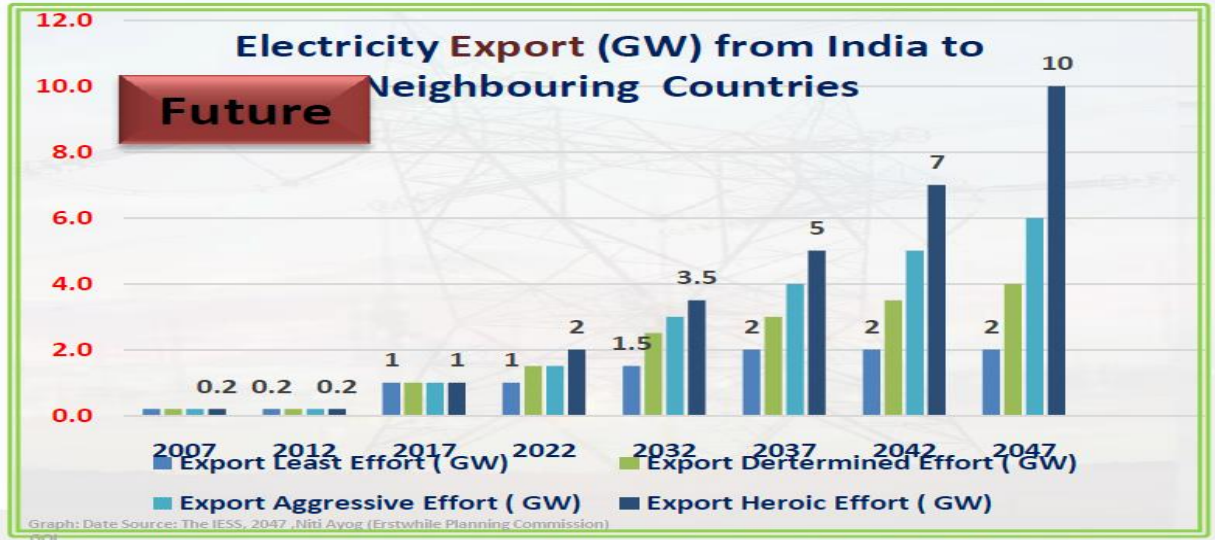
Current Status of Cross Border Electricity Trade (CBET) and Future Trading Scenarios







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Overview of SARI/EI Program

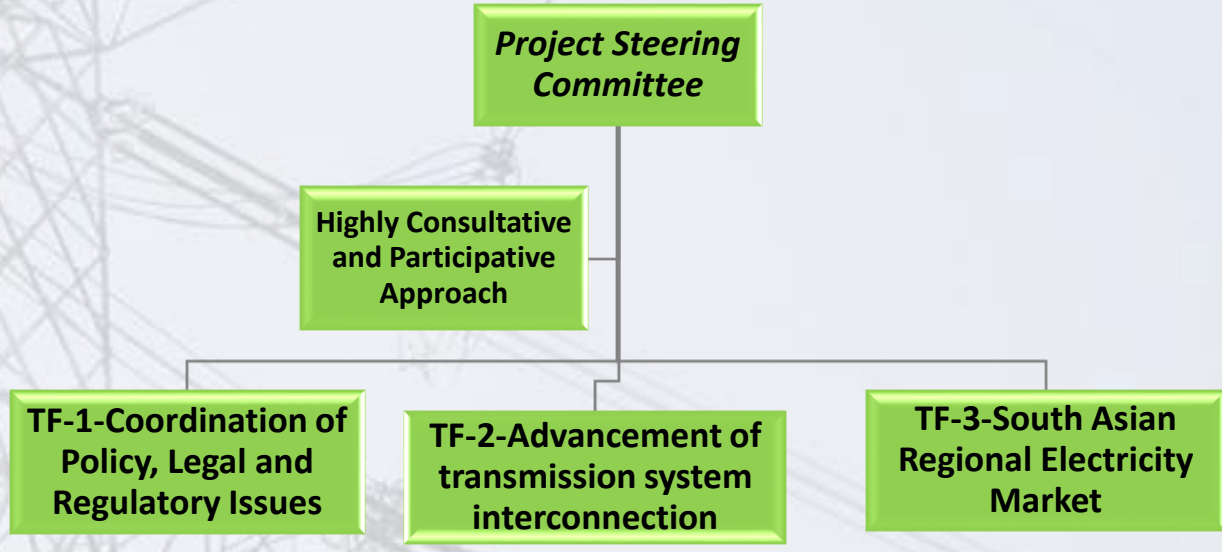
SARI/EI : Overview & Framework

- **Long standing program of USAID started in the year 2000**

- **SARI/EI–Phase IV (2012-2018):**
  1. Coordinate policy, legal and regulatory issues.
  2. Advance transmission interconnections.
  3. Establish South Asia Regional Electricity *Markets*

- **Project Steering Committee (PSC)** is the apex body of the program and provides overall strategic directions. PSC members consist of **Senior level officials from the country governments, SAARC, ADB, Independent Energy Experts/Diplomats.**

- Task Forces are **represented by Government Nominated members of level of Directors/Chief Engineers/Members etc. from Utilities, Regulators, planners, Power Exchanges of SA countries.**



- **TF1: Coordination of Policy, Legal and Regulatory issues**

- **TF-2: Advancement of transmission system interconnection**

- **TF 3: South Asian Regional Electricity Market**

SARI/EI Overall Framework for development of CBET in SA

SAARC Framework Agreement on Energy (Electricity) Cooperation

CBET facilitation through

Institutional Mechanism

- SAFER
- Investment Forum
- SAFTU

Demand Driven Studies

- Regional Regulatory Guidelines
- Regional Investment Framework and Investment Policy Guidelines
- Harmonization of Grid Codes
- Assessment of Trading Potential
- Model framework for Open Access and Trading License Regime
- Transmission Master plan and Pricing
- Model Regulation for Power Market Development
- Standard Contracts (Bankable PPAs/TSAs)
- Mock Exercise for SARPEX
- Analytical Studies

Undertaken as part of the TF-1 and has been Published

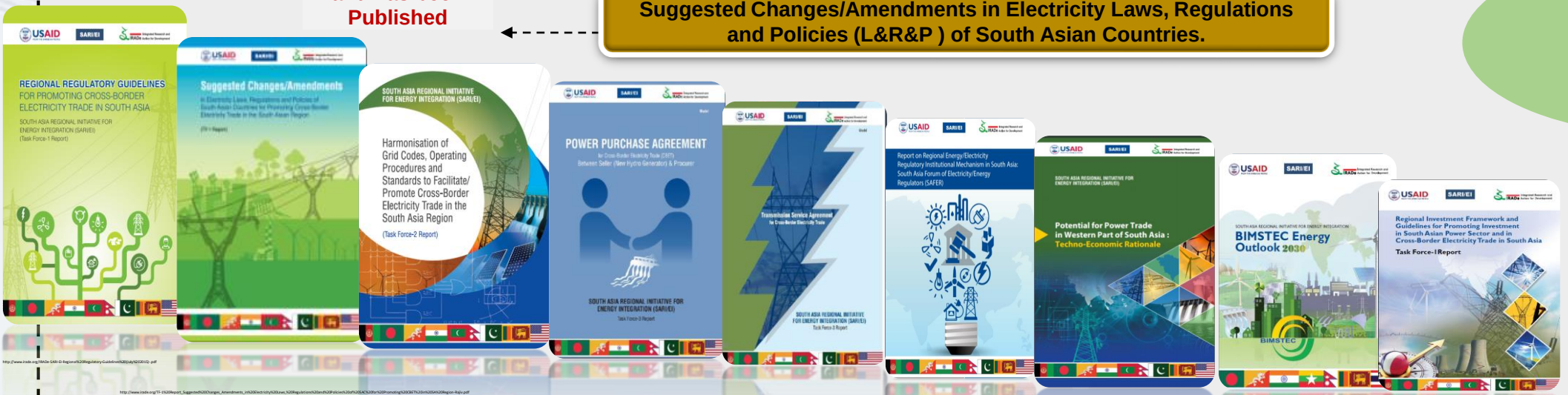
Suggested Changes/Amendments in Electricity Laws, Regulations and Policies (L&R&P) of South Asian Countries.

International Consultants

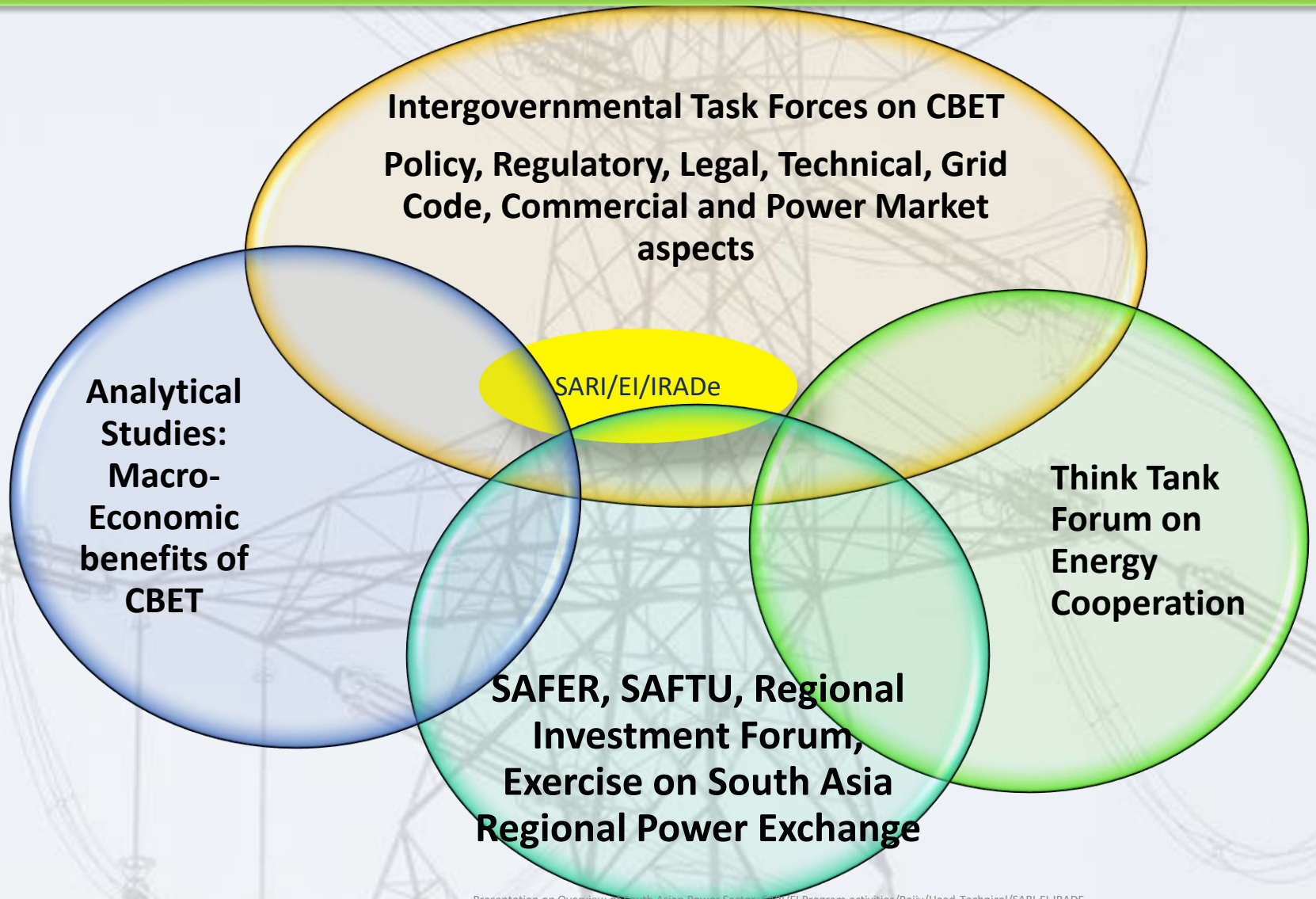
Deloitte, KMPG

PRDC, PWC, ICF

Mercados, E & Y



SARI/EI: Various Streams of Work



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Brief overview of Research Studies carried out under SARI/EI Program

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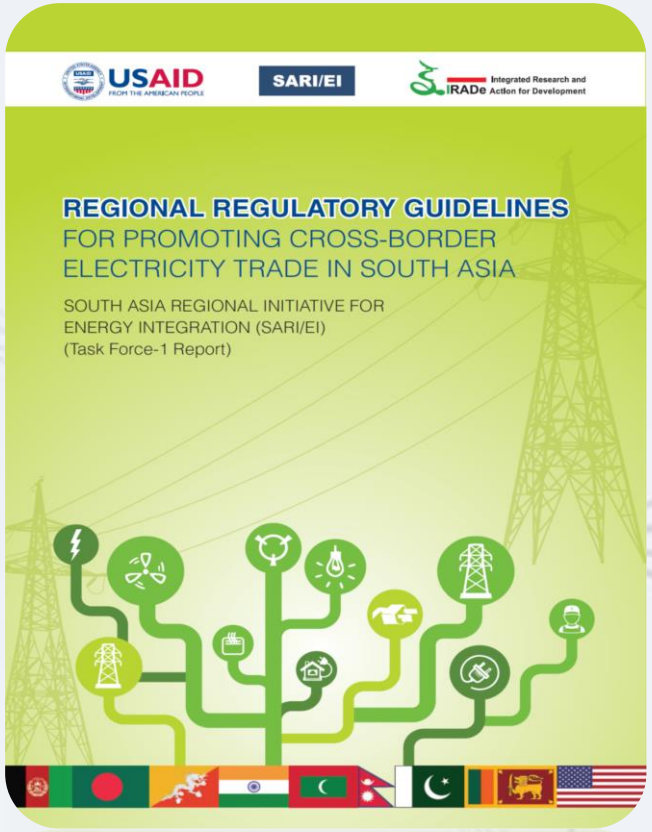
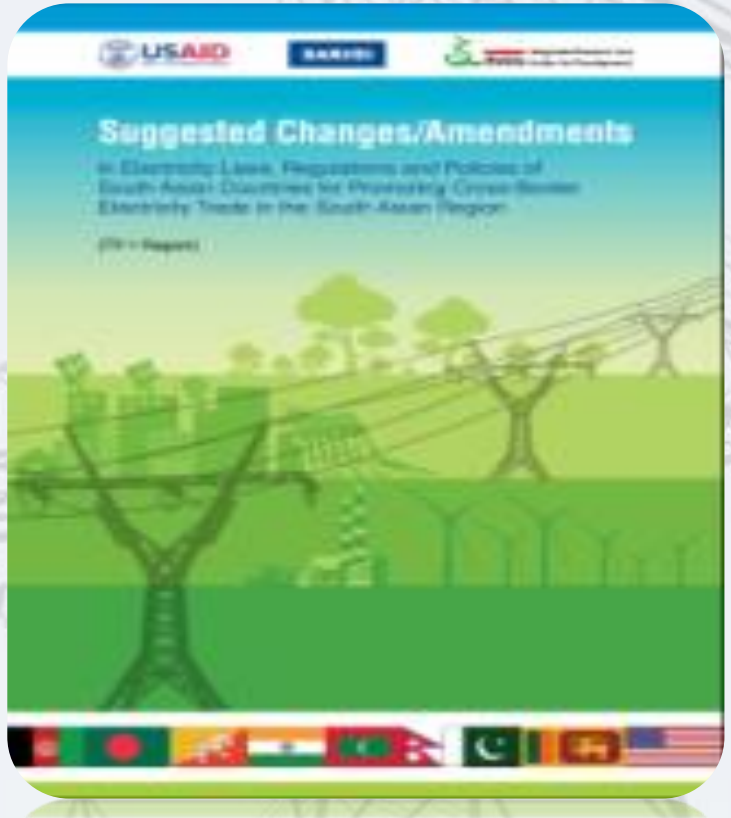
Key Research Studies/Reports on Policy, Regulatory and Legal Harmonization/Coordination in South Asia

Regional Regulatory Guidelines



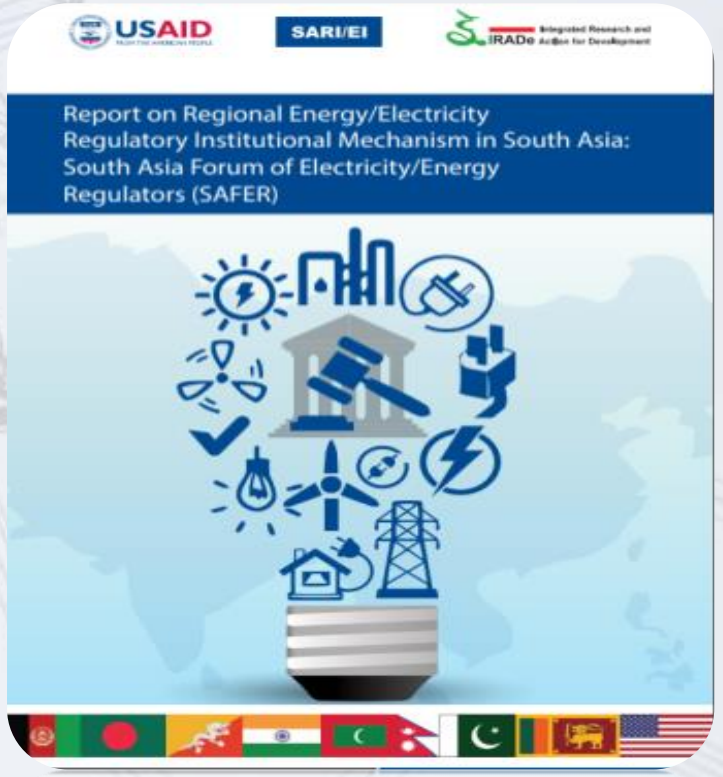
http://irade.org/IRADe-SARI-EI-Regional%20Regulatory-Guidelines%20(July%202015)-.pdf

Suggested Changes/Amendments in Electricity Laws/Regulations/Policies



http://www.irade.org/TF-1%20Report_Suggested%20Changes_Amendments_in%20Electricity%20Laws,%20Regulations%20and%20Policies%20of%20SAC%20for%20Promoting%20CBET%20in%20SA%20Region-Rajiv.pdf

South Asia-South Asia Forum of Energy/Electricity Regulators (SAFER)



http://irade.org/Report%20on%20Regional%20Energy%20Electricity%20Regulatory%20Institutional%20Mechanism%20in%20South%20Asia%20SAFER.pdf

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http://irade.org/IRADe-SARI-EI-Regional%20Regulatory-Guidelines%20(July%202015)-.pdf

http://www.irade.org/TF-1%20Report_Suggested%20Changes_Amendments_in%20Electricity%20Laws,%20Regulations%20and%20Policies%20of%20SAC%20for%20Promoting%20CBET%20in%20SA%20Region-Rajiv.pdf

http://irade.org/Report%20on%20Regional%20Energy%20Electricity%20Regulatory%20Institutional%20Mechanisim%20in%20South%20Asia%20SAFER.pdf

Background of the Regional Regulatory Guidelines

Background - ***Regional Regulatory Guidelines*** *is one of the outcome of the TF-1 study on Review of Electricity Laws, Policies and Regulatory framework of SAC to identify critical requirements of CBET and recommend changes/amendments therein for consideration of the SA countries*

Steps for the Study

1. Review of Existing Studies/ Literature/ Reports
2. Review & Analysis of EL&R&P in SAC and identification of key ingredients of CBET
   - Current status in member countries w.r.t identified ingredients
3. Review of International Power Pools and Identification of Best practices wr.t CBET
   - Europe, Nord Pool,SAAP, West Africa, GCC, Georgia-Turkey, SEIPAC,GMS, Central Asia-South Asia(CASA)
4. Recommendations for SAC based on best practices identified & Risk Analysis
5. Development of Regional Regulatory Guidelines for CBET
6. Recommend changes/ amendments in the EL&R&P of SAC to promote CBET
7. Roadmap for development of a harmonized framework for CBET

Preamble to the Guidelines

- *These regulatory guidelines apply to CBET among the South Asian countries.*
- *These guidelines are **non-binding in nature and are aimed to provide national regulators of SAC with a consistent set of guidelines** applicable to CBET*
- *The **guidelines deal only with limited areas where need for such common guidelines has been felt** by the SAC and are not meant to be comprehensively dealing with all matters related to CBET. **For all other purpose, respective national regulations, rules and guidelines shall apply**.*
- ***Appropriate Institutional Mechanism is required for facilitating and working towards enabling the guidelines and facilitating the required changes** to be made in the national regulatory framework. Such entity shall work in close coordination with the National Energy/Electricity Regulators and SAARC for the same. Study has proposed a Forum i.e South Asia Forum of Electricity **SAFER for the Coordination, and facilitate the implementation of the RRGs.***
- *In countries where regulators do not exist, the responsibilities shall rest with relevant ministry and/or empowered entity .*

Regional Regulatory Guidelines

Context of the guidelines

- CBET in the region is largely on bilateral basis and is limited
- This is set to change with several new transmission interconnections being proposed that will enable greater integration of power systems in member countries
- Harmonization/coordination of EL&R&P framework is a critical requirement
- The agreements/guidelines needs to recognize the diversity in countries
- Be compatible with respective country's EL&P&R framework

Existence of political will and consensus is evident from the IGFA

The **SAARC Inter-Governmental Framework Agreement (IGFA) for Energy Cooperation**, signed by Foreign Ministers of the eight member states **provides a strong basis for ensuring consistency in certain identified areas** of trade as follows

- *Article 4 (Duties & Taxes)*
- *Article11 (System Operation and Settlement Mechanism)*
- *Article 12 (Transmission Access)*
- *Article 15 (Regulatory Mechanisms)*

It is important to provide actionability to the Articles by defining them into operating rules and common guidelines w.r.t CBET transactions

The guidelines are based on the review of the existing CBET transactions and the existing laws, policies and regulations and review of international experience of various power pools

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Regional Regulatory Guidelines

Purpose of the guidelines

The flexible nature of the guidelines and focus on specific aspects of CBET, would permit both the guidelines and the national regulatory framework to co-exist for a reasonable period of time.

Specific aspects requiring consensus through common operating principles

1. ***Licensing for cross border trading***
2. ***Open access to Tx network***
3. ***Transmission pricing regime***
4. ***Transmission planning***
5. ***Imbalance settlement mechanism***
6. ***Harmonization of Codes***
7. ***Dispute Resolution***
8. ***Duties and tax regimes***

Regional Regulatory Guidelines

Brief Summary of guidelines

1. **Licensing for CBET:** (*Important Regulatory Tool for Trading*)
   - *Recognition of Trading as a* ***separate licensed business activity***
   - *Grant of license for CBET* ***through a well defined process***
   - ***License requirements*** *and the underlying rules/limitations*

2. **Open access to transmission system:** *(Competitive Market)*
   - ***Setting of fair rules and procedures*** *for non-discriminatory open access*
   - ***Modification/amendment of applicable regulations and gradually legally binding provisions***
   - *Defining* ***application process, eligibility criteria, priority order*** *and nodal agency for OA*

3. **Transmission Pricing:** (*cost reflective & efficient*)
   - *Transmission pricing mechanism based on a* ***country's requirement and acceptability***
   - *Setting up* ***principles and mechanism for determination of economically efficient transmission pricing regime*** *and gradually adopting methods based on the concept of location specific pricing*
   - *Adoption of* ***tariff framework in respective country power system through enabling regulations***

4. **Imbalance Settlement:** *(transparent common procedure)*
   - *Member Countries to* ***develop a common set of procedures for Imbalance Settlement for*** *CBET transactions*
   - *This will include* ***preparation of scheduling, dispatch, energy accounting and settlement procedures*** *for both AC-AC & AC-DC interconnections in the region*

Regional Regulatory Guidelines

Brief Summary of guidelines

5 Transmission Planning: *(coordinated Regional Planning)*

- ***Development of a regional coordination forum of National Transmission Utilities*** *to coordinate between Member Countries on transmission planning aspects*
- ***Development of a database of information that enables coordination*** *and cooperation towards transmission planning*
- ***National Transmission Plans*** *to also* ***include details of cross border transmission lines*** *(specifically for CBET) & associated infrastructure*
- *Sharing of the national transmission plan at the regional level and progress towards* ***developing a regional level master plan***

6 Harmonization of codes: *(safe and reliable regional integrated system operation)*

- ***Harmonization*** *through* ***formulation of guidelines on technical standards for interconnection of power systems*** *on aspects related to voltage standards, frequency tolerance, thermal limits etc.*
- ***Sharing of technical characteristics and system specific data*** *among the member countries*
- ***Rules on metering standards, communication technologies****, Protection Schemes etc.*

7 Taxes & Duties: *(for fostering investment and removing trade barriers)*

- *Countries to* ***gradually move towards a zero tax regime***

8 Dispute Resolution: *(transparent and fair legal framework)*

- *Dispute Resolution process should primarily be in accordance with the* ***agreements or through amicable settlement***
- ***Referring the disputes to the SAARC Arbitration Council in case the member countries are unable to resolve disputes*** *through amicable settlement*

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Key Research Studies/Reports on Policy, Regulatory and Legal Harmonization/Coordination in South Asia

Regional Investment Framework

http://irade.org/SARI-EI-Report-Regional-Investment-Framework-and-Guidelines-for-Promoting-Investment-in-SA-Region-Report.pdf

Open Access and Trading License Model Framework

BIMSTEC Energy Outlook-2030

http://irade.org/SARI-EI-Report-on-BIMSTEC-Energy-Outlook-2030.pdf

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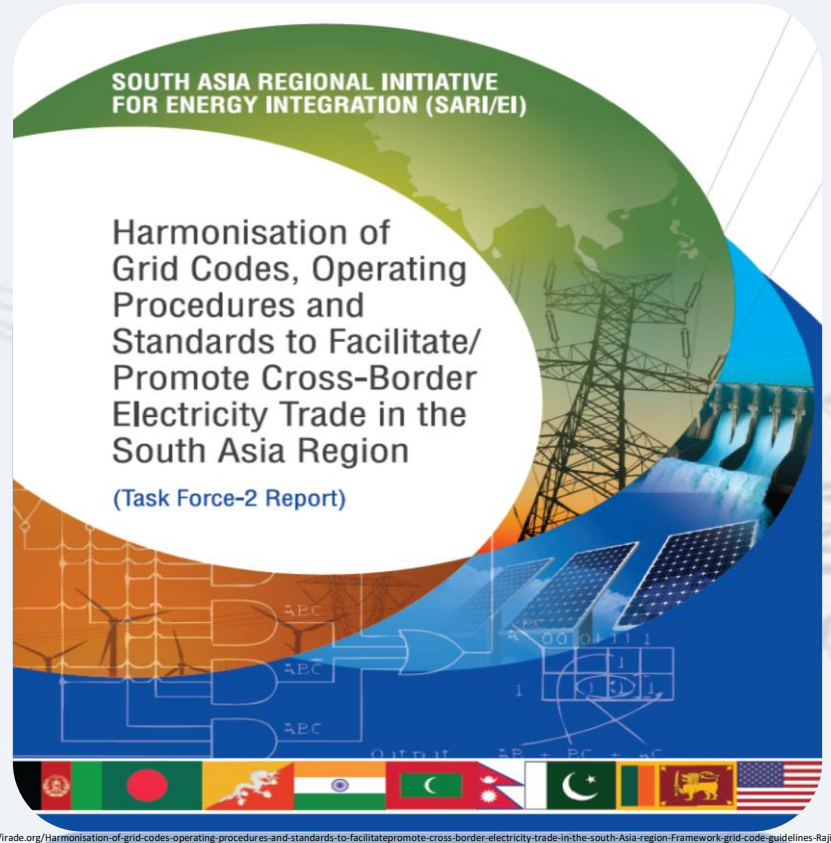
Key Research Studies/Reports on Transmission Interconnection in South Asia

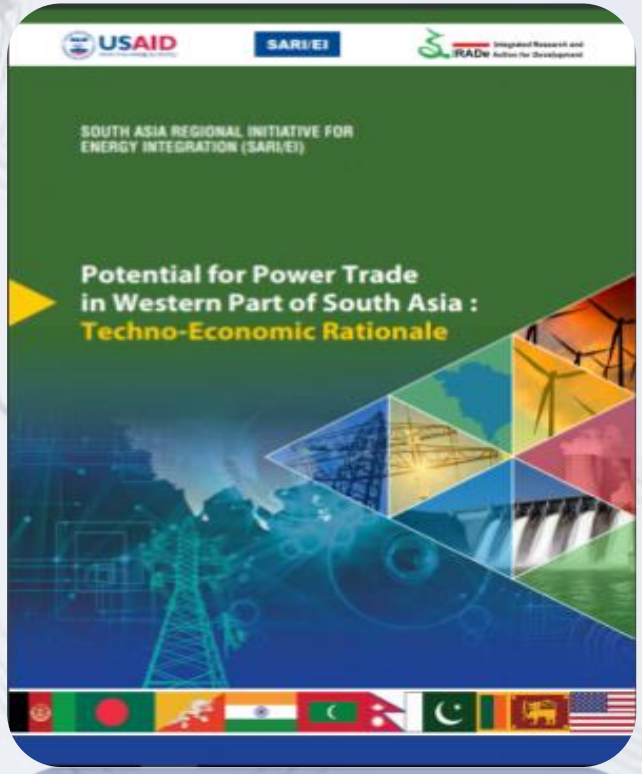
Harmonization of Grid codes, operating procedures and Standards for promoting CBET in South Asia



ttp://irade.org/Harmonisation-of-grid-codes-operating-procedures-and-standards-to-facilitatepromote-cross-border-electricity-trade-in-the-south-Asia-region-Framework-grid-code-guidelines-Rajiv-LR-1.pdf
ttp://irade.org/Report-on-Potential-for-Power-Trade-in-Western-Part-of-South-Asia-A-Techno-Economic-Analysis-High-Resolution.pdf

Assessment of Power Trading Potential by 2034

Potential for Power Trade in Western part of South Asia- Techno-economic Rationale



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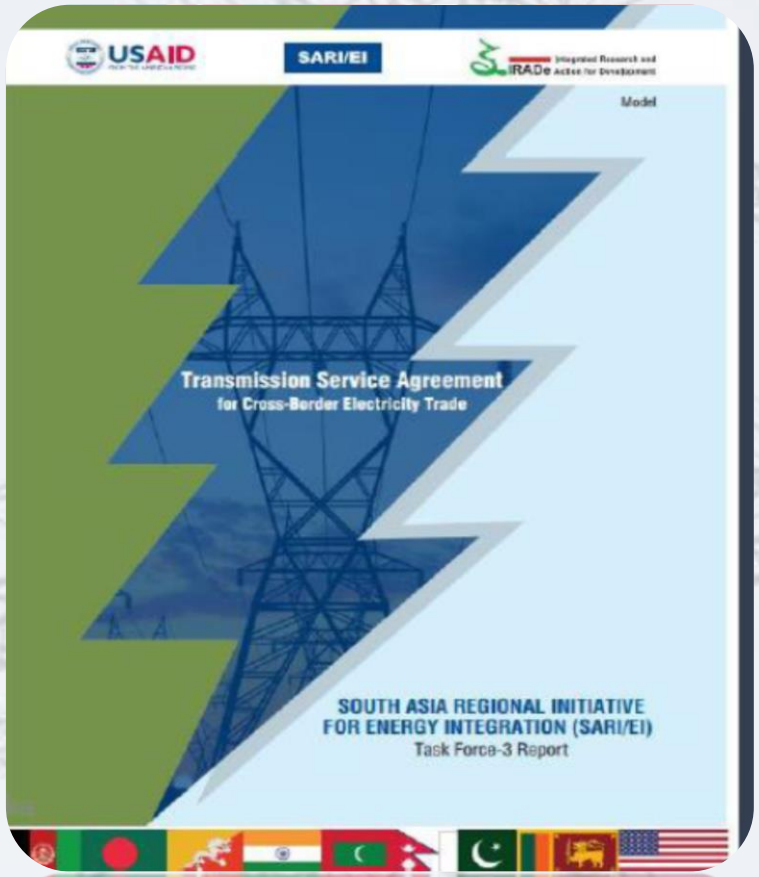
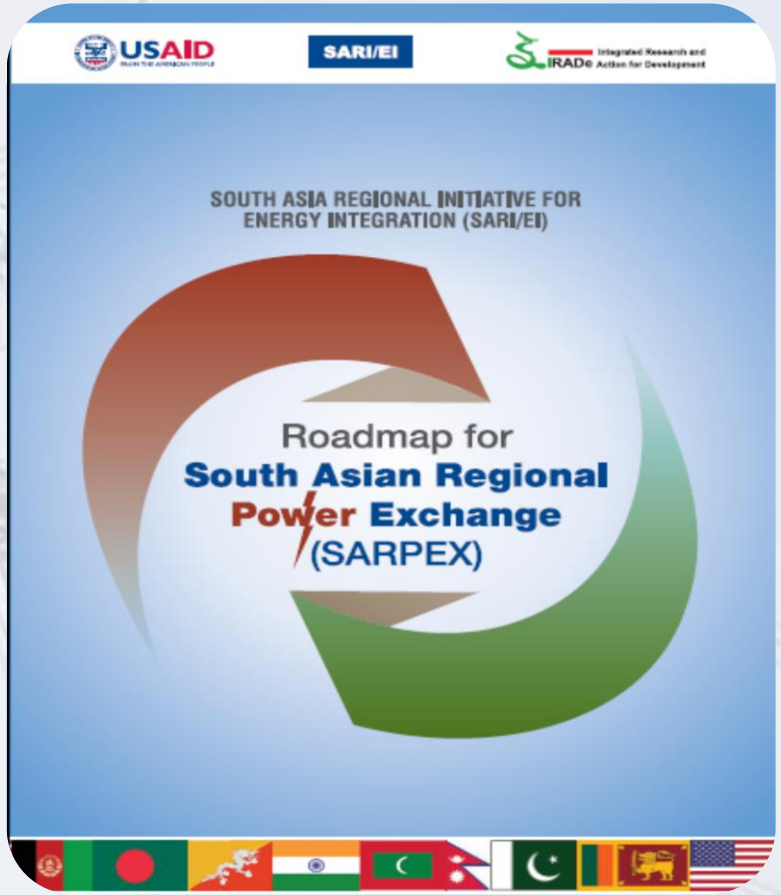
Key Research Studies/Reports on Regional Power Market in South Asia

Model Power Purchase Agreements

Model Transmission Service Agreements



Report on South Asia Regional Power Exchange



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South Asian Power Sector- Projected Installed Capacity and Investment Requirements by 2040

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South Asian Power Sector- Installed Capacity Requirements by 2040

South Asia is projected to require 1067 GW of installed capacity by 2040.

- India -783.9 GW
- Bangladesh -76.8 GW
- Nepal-9.3 GW
- Sri-Lanka -11.7 GW
- Bhutan-14.8 GW

South Asia is projected installed capacity in GW By 2040

Country	2020	2030	2040
Afghanistan	1.1	6.0	7.0
Bangladesh	27.2	48.7	67.8
Bhutan	6.9	14.7	14.8
India	387.2	586.5	783.9
Nepal	3.4	7.9	9.3
Pakistan	57.5	108.7	173.0
Sri Lanka	5.8	9.1	11.7
Total	489	782	1067

Source : https://openknowledge.worldbank.org/handle/10986/22224

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South Asian Power Sector- Investment Requirement for the 2015-2040 Period

- South Asia is projected to require 1,390 billion US$ for expanding electricity generation from 2015-2040 period (to add apprx. 750 GW of generation capacity).
- Already committed and planned inter-grid connection, especially within India would require around 29 billion US$.

Investment Requirement for the 2015-2040 Period (Billion US$, Undiscounted)

Country	Investment (Generation)	Investment (Interconnection)
Afghanistan	16.36	0.18
Bangladesh	105.12	0.63
Bhutan	32.08	0.54
India	929.67	27.93
Nepal	10.75	0.00
Pakistan	276.96	0.00
Sri Lanka	18.67	0.00
Total	1,390	29

Source : https://openknowledge.worldbank.org/handle/10986/22224

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Key Risk and Challenges in CBET

Key Risk and Challenges in CBET

Key Challenges

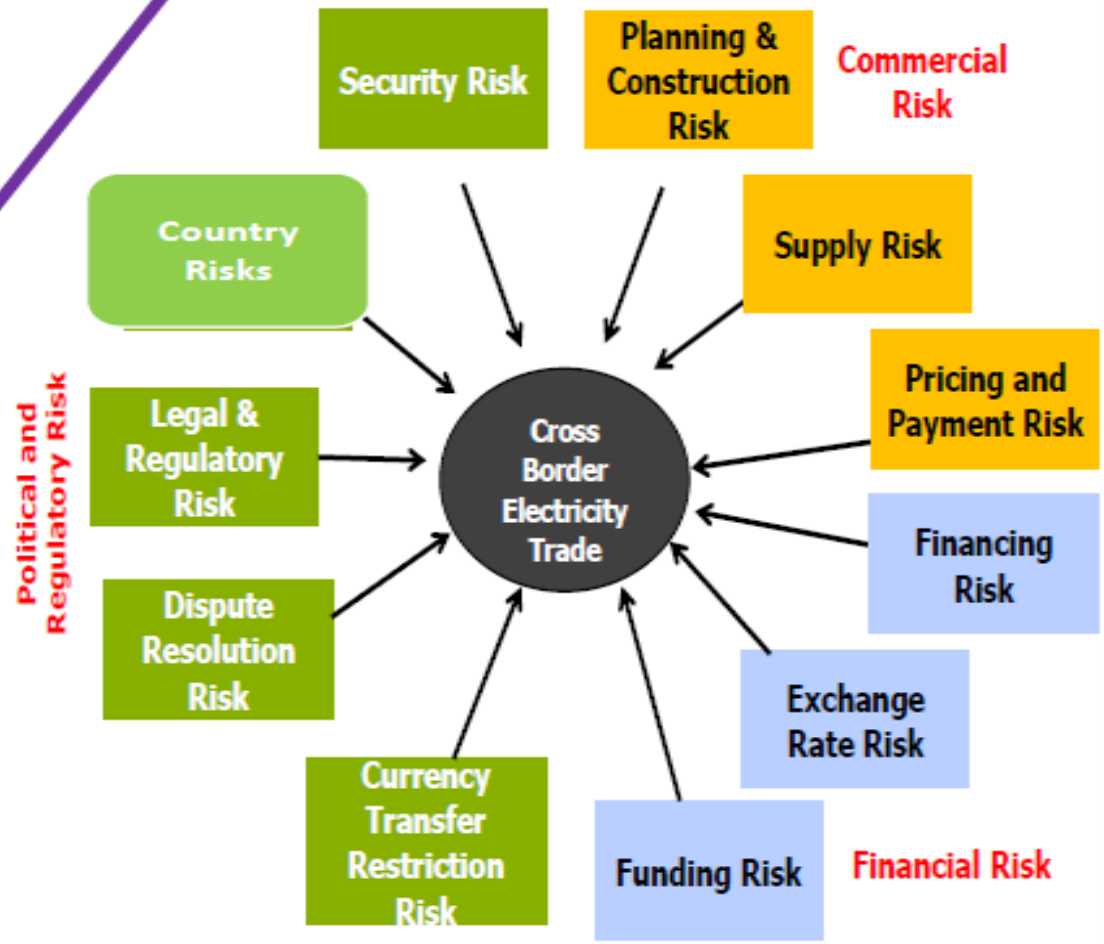
1. Political Conesus : Regional Cooperation and Recognition of CBET/Trade in the National Policy, Law
2. Government Commitment & Policy Coordination
3. Financial Challenges, Investment , Financial Viability
4. Mechanism of Inter-connection
5. Market form of Trade
6. Regional Cooperation on Regulatory and Contractual Aspects
7. Open Access in Transmission
8. Transmission Charges/Pricing
9. Transmission Plan
10. Commercial Mechanisms to Settle Imbalances
11. Dispute Resolution

Regional Power System at Initial Stages

Regional Power System at in Transition and Mature Stages

Motivation behind these challenge is to address the typical Risks in Cross-Border Projects.

What are the Risk?



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Conducive Policy and Regulatory Framework

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Need for Conducive Policy and Regulatory Framework for Facilitating Investment in the Region

1 **Policy and Regulatory harmonization**

2 **Guarantees against Political and country risks**

3 **Regional dispute resolution and settlement mechanism**

4 **Streamline project approval and clearance process**

5 **Standardize contractual framework**

6 **Tariff rationalization for the hydropower projects**

7 **Access to innovative and cheaper sources of funding**

8 **Develop region specific financing instruments**

9 **Support private participation through innovative models**

10 **Regional institutional coordination mechanism**

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Key Impacts/Milestone Achieved

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Key Impacts Milestone Achieved in South-Asian Region CBET since 2012-13

2012-13	2013-14	2014-15	2015-16	2016-17
India-Bangladesh 500 MW HVDC link commissioned	India-Nepal Power Trade Agreement Signed	SAARC framework agreement on energy (electricity) co-operation signed	Tripura (India)-Comilla (Bangladesh) 400KV transmission interconnection commissioned & 100 MW power exported	GOI issued guidelines for CBET, **NERC act Passed** **National Transmission Plans are updated with CBET** Increased by 800 MW of additional power trade since 2012. **3379 Person hours Training** **1023752.54 Metric Tones of CO2 Reduction**

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Institutionalization of the Process of CBET and Power Sector Integration in South Asia: Efforts being Made by SARI/EI

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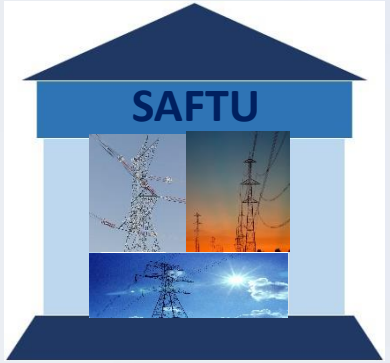
Efforts being made by SARI/EI

1. SARI/EI study on Harmonization of Grid codes and operating procedures recommended for creation of a regional technical institution such as -South Asia Forum of Transmission Utilities (SAFTU).



2. Initial Discussion held with PGCIL. Draft Scope of work finalized.

3. Discussions initiated with SAARC Chamber of Commerce for creation of a **Investment Facilitation Forum in South Asia** and also to identify few projects for financial closure.

4. Discussions initiated with Bangladesh Tribunal for creation of an **Institution for Settlement/Resolution of Dispute.**

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Our Strong Relationship in South Asia

- ✓SAARC Secretariat
- ✓SAARC Energy Centre
- ✓SAARC Chamber of Commerce
- ✓South Asia Forum of Infrastructure Regulations
- ✓BIMSTEC Secretariat
- ✓Secretary , Joint Secy. Of Ministry of power and Energy of SA countries
- ✓Heads/Chief Engineer/Directors of the Power utilities.
- ✓Regulatory Commissions
- ✓MDBs such as ADB, AIIB.
- ✓Private Sector, Think Tank

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Synthesis of SARI/EI Recommendations-Preparation of Combined Task Force Report, Road Map, Policy Briefs, Summary for SA Policy Makers

Synthesis of SARI/EI Task Force Recommendation

Synthesis of SARI/EI Task Force Recommendation

- Regional Regulatory Guidelines (RRGs)
- Suggested Amendments in Electricity Laws, Regulations and Policies
- Regional Investment Framework and Policy Guidelines
- Trading Potential
- Model PPAs/TSAs
- Mock Exercise for South Asia Regional Power Exchange (SARPEX)

Way Forward

Implementation of Intergovernmental Framework Regional/bilateral Agreement/Treaties.

Continue to provide technical and knowledge support work to SAFIR working Group for developing model regulation, regulatory cooperation , knowledge sharing , capacity building etc.

Synthesis of Task force findings and combined TF Reports , Developing Policy Briefs, Road Map, Summary for South Asian Policy Makers

Implementing the Concept of South Asia Forum/Association of Transmission utilities for coordinated planning, operational aspect of CBET

Need to promote development of Hydro Power and Renewable Energy, being clean, renewable, helps in reduction of CO2 emission, load balancing etc.

Continue to work with SAARC, BIMSTEC, SAFIR , Country Govt, Regulators, Power Utilities, Private Sector, Civil Societies etc. to promote consensus building and CBET in the Region.

Financial Viability of power sector to be improved to sustain CBET in long run

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Thank You

Annexure-III

Presentation on

Regulatory Cooperation to Facilitate Knowledge sharing, Addressing Cross Cutting Energy/Electricity Regulatory Issues

Md. Firoz Zaman
Deputy Director
Bangladesh Energy Regulatory Commission

Contents

- Introduction
- Structure of Power Sector
- BERC: Vision, Mission, Major Functions, Achievements
- Power Sector: Generation Plan, Fuel Mix
- Regional Cooperation
- Challenges and Way Forward

Bangladesh at a Glance

- Official Name : People's Republic of Bangladesh
- Political System : Parliamentary Democracy
- Area : 147,570 km2
- Population : 164 million
- Total Exports : USD 35 billon
- Total Imports : USD 45 billon
- Remittance : USD 15 billon
- Forex Reserve : USD 34 billion
- GDP Per Capita : US$ 1,754
- GDP Growth rate: : 7%

VISION

Vision 2021-

- To be a Middle-Income Country

Vision for Power Sector:

- **To provide quality electricity to all at affordable price**

Present Structure of Power Sector

- ***Ministry***

  Ministry of Power Energy & Mineral Resources (MPEMR)

- ***Regulator***

  Bangladesh Energy Regulatory Commission (BERC)

- ***Generation***

  - **Bangladesh Power Development Board (BPDB)**
  - **Ashugonj Power Station Company Ltd. (APSCL)**
  - **Electricity Generation Company of Bangladesh (EGCB)**
  - **North West Power Generation Company Ltd. (NWPGCL)**
  - **Coal Power Generation Company Bangladesh Ltd. (CPGCL)**
  - **Independent Power Producers (IPPs)**

- ***Transmission***

  - **Power Grid Company of Bangladesh Ltd (PGCB)**

- ***Distribution***

  - **Bangladesh Power Development Board (BPDB)**
  - **Dhaka Power Distribution Company (DPDC)**
  - **Dhaka Electric Supply Company Ltd (DESCO)**
  - **West Zone Power Distribution Company (WZPDC)**
  - **Northern Electricity Supply Company (NESCO)**
  - **Rural Electrification Board (REB) through Rural Co-operatives**

BERC ACT 2003

Bangladesh Energy Regulatory Commission Act, 2003

Enacted on 13 March, 2003

And

came into effect on 24 April, 2004

Vision

To establish
Bangladesh Energy Regulatory Commission
as a world class organization
to ensure justice and good governance
in Energy Sector by 2030.

Mission

- **To promote equal opportunities for public and private investment**
- **To ensure justice through dispute settlement**
- **To protect consumers' interest in energy sector**
- **To ensure good governance in energy sector**
- **To fix up reasonable tariff in energy sector**
- **To issue licenses among the government and private agencies dealing with energy business**
- **To ensure efficiencies in energy sector**
- **To develop competitive market for energy sector**

Major Functions of BERC

- **Licensing:**
  - Electricity Generation incl. captive, Transmission and Distribution
  - Natural Gas Transmission and Distribution;
  - Petroleum Storage, Distribution, Marketing
- **Tariff Setting:**
  - Electricity- Bulk and Retail
  - Gas
- **Dispute Settlement: Between Licensees; Licensee and Consumers**
- **Consumers' Rights Protection**
- **Codes and Standards for ensuring quality energy supply**

Achievements

- BERC has introduced harmonization in tariff for power distribution companies.

- BERC has created Life-Line tariff for rural and marginal electricity consumers.

Achievements

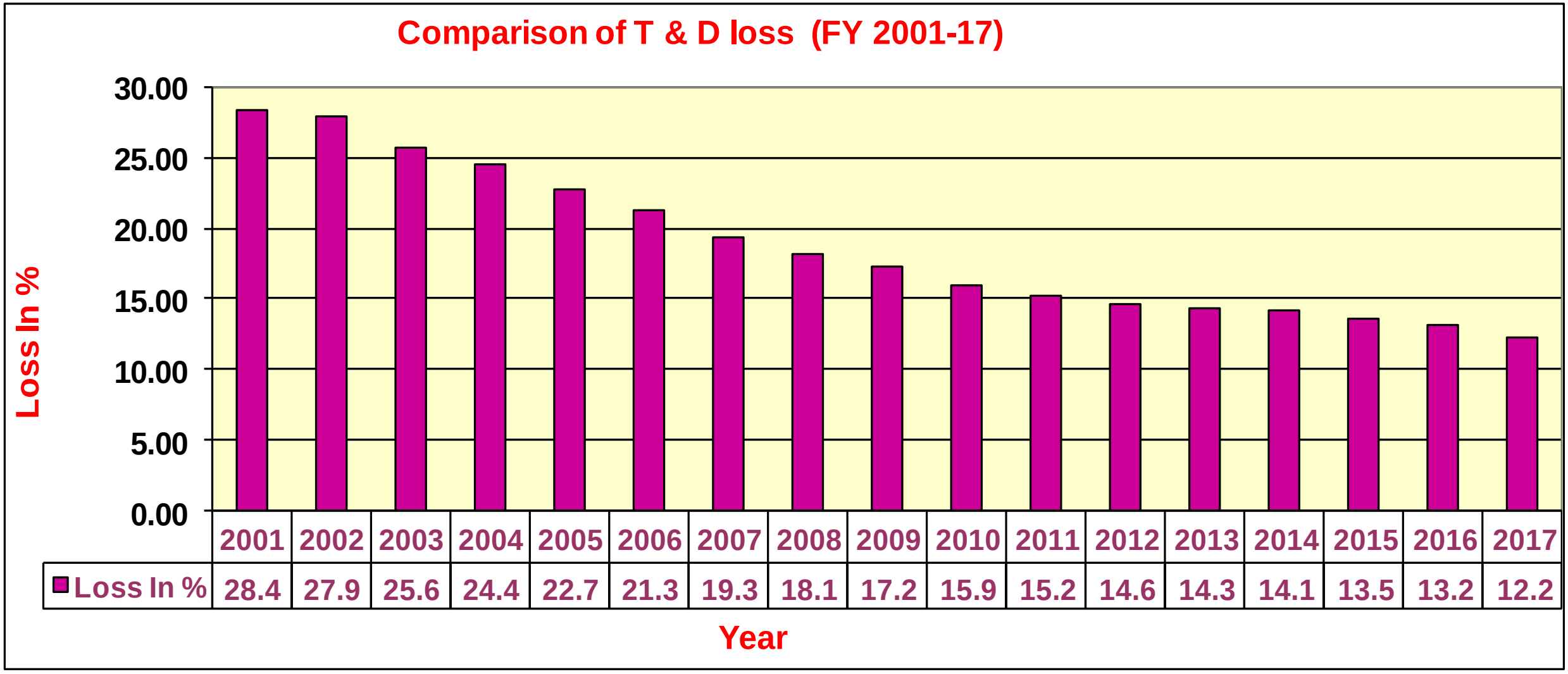
- BERC has taken initiative to create the following funds for sustainable energy supply :

  - **To augment the financial capacity for exploration and production of gas by the nationalized companies, the Commission has created ‘Gas Development Fund’.**
  - **In order to increase the efficiency and capability of Power sector, the Commission has created ‘Electricity Maintenance and Development Fund’.**
  - **To ensure the energy security and future development, the Commission has created ‘Energy Security Fund’.**

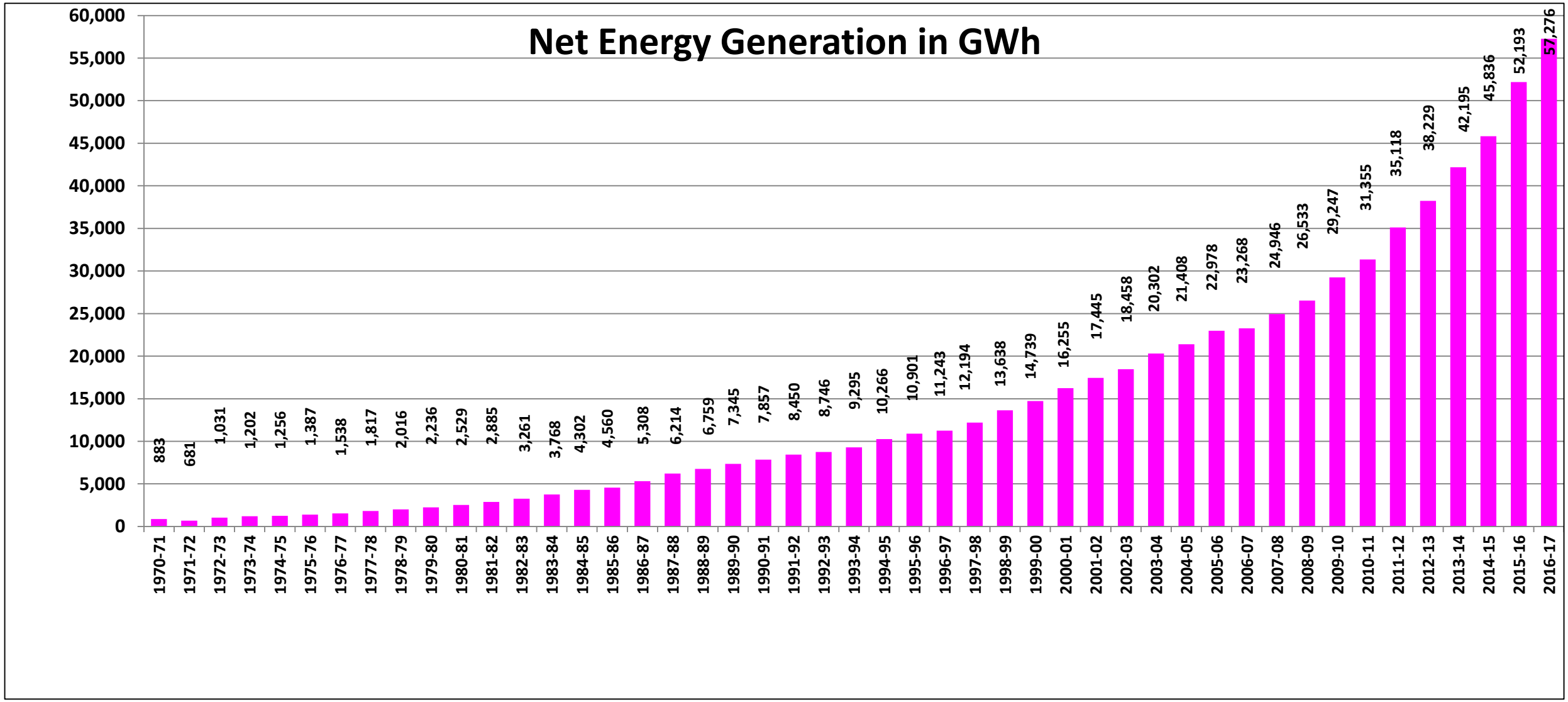
Power Sector: At a Glance

- **Generation Growth : 10.2 % (Av.)**
- **Total Gen. Capacity : 16,046 MW**
- **Consumers : 26.7 Million**
- **Transmission Line : 11,000 Ckt. km**
- **Distribution Line : 440,000 km**
- **Power Import : 700 MW**
- **Total System Loss (T&D) : 9.98 %**
- **Per Capita Generation : 433 kWh**
- **Access to Electricity : 90%**
- **Renewable Energy : 10 % of total generation**

Loss Reduced Significantly: A Success Story



Historical Energy Net Generation (GWh) in Bangladesh



Generation Plan: 2017-2041

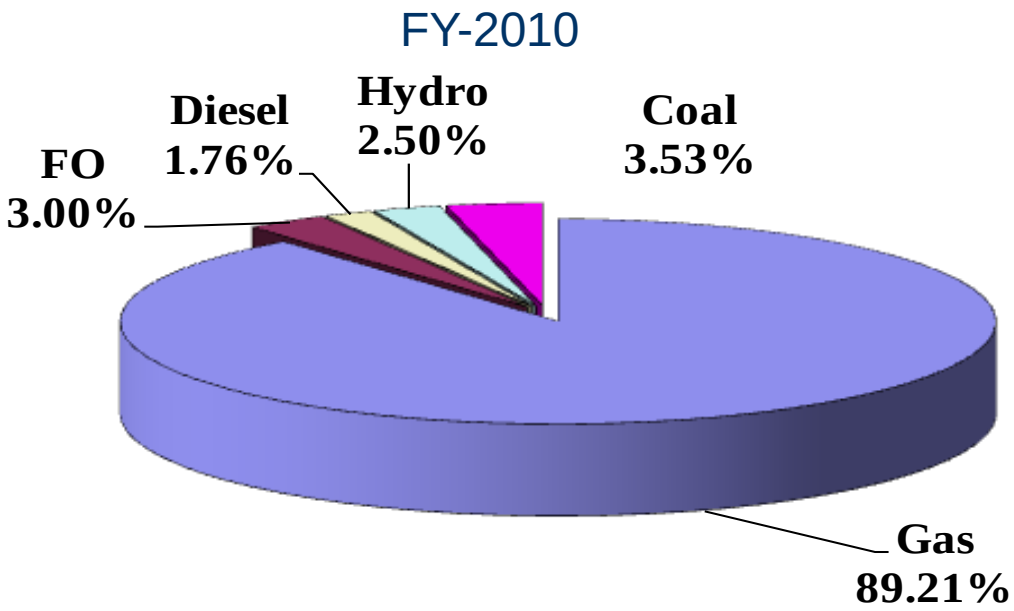
Year	Present (2017)	2021	2030	2041
Grid Capacity (MW)	13,621	24,000	40,000	60,000

Year wise Generation Plan: 2017-2021

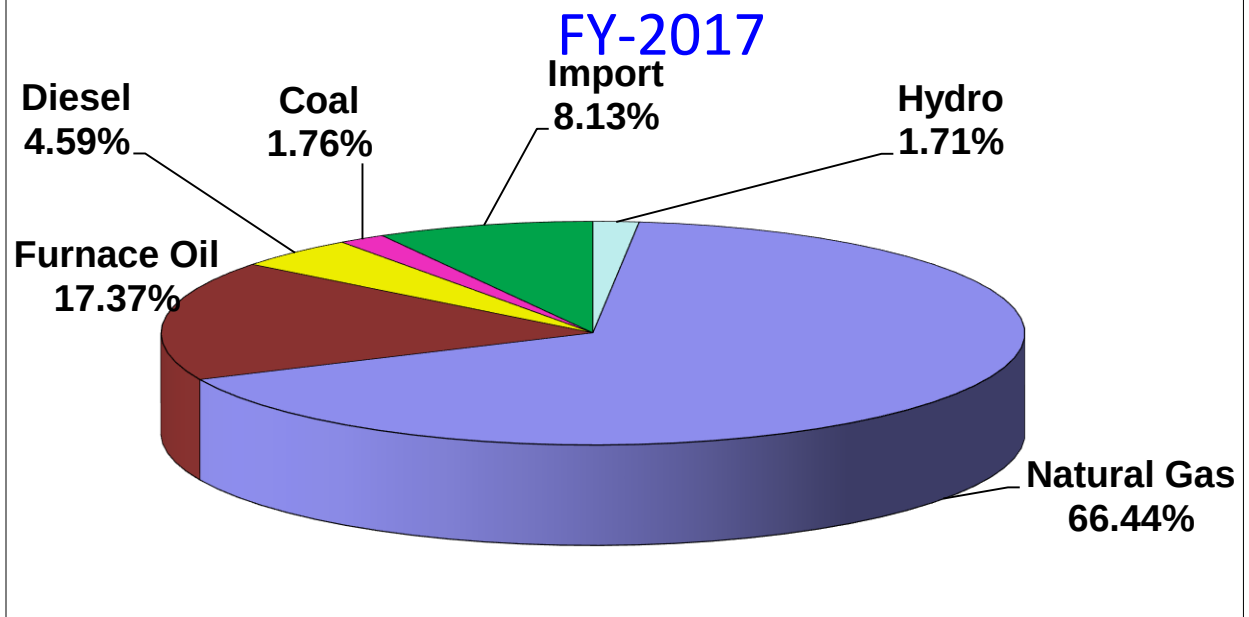
(MW)

Year	2017	2018	2019	2020	2021	Total
Public Sector	1464	1449	2645	1385	2805	9748
Private Sector	385	803	2454	2029	1464	7135
Total	1849	2252	5099	3414	4269	16883

Fuel Mix: FY 2010 & 2017



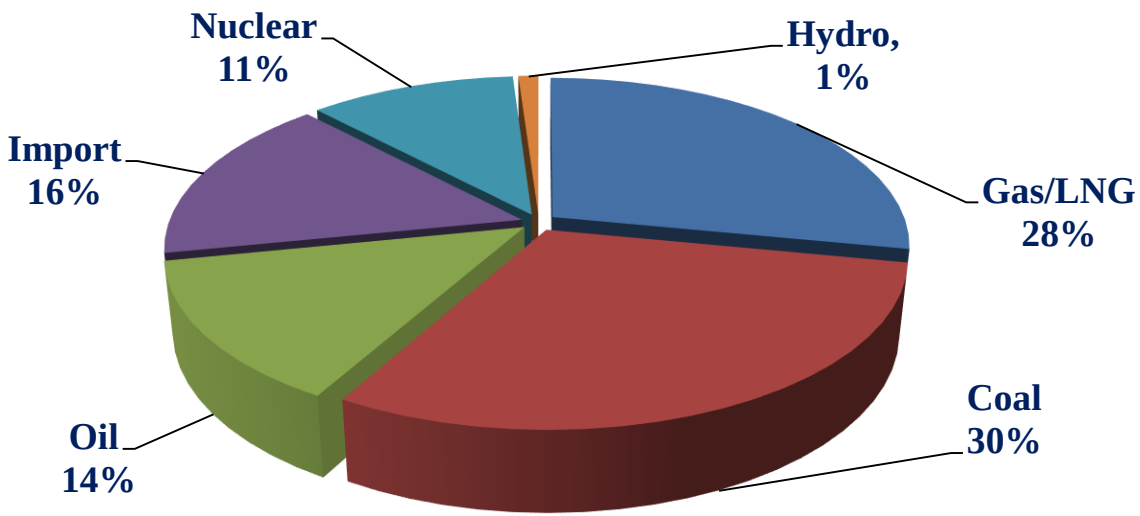
Total Net Generation : **29,247** M kWh



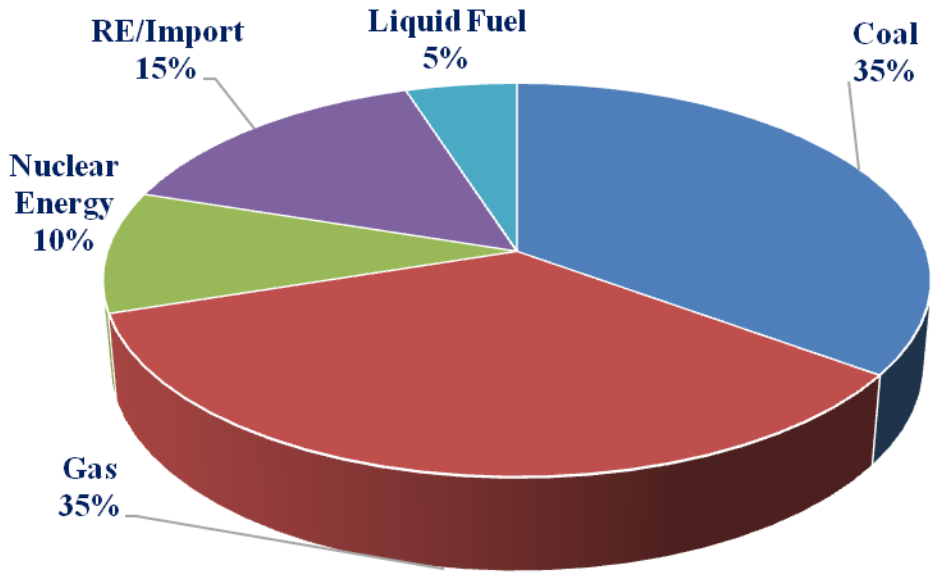
Total Net Generation : **57,276** MkWh

Fuel Mix: Future Plan

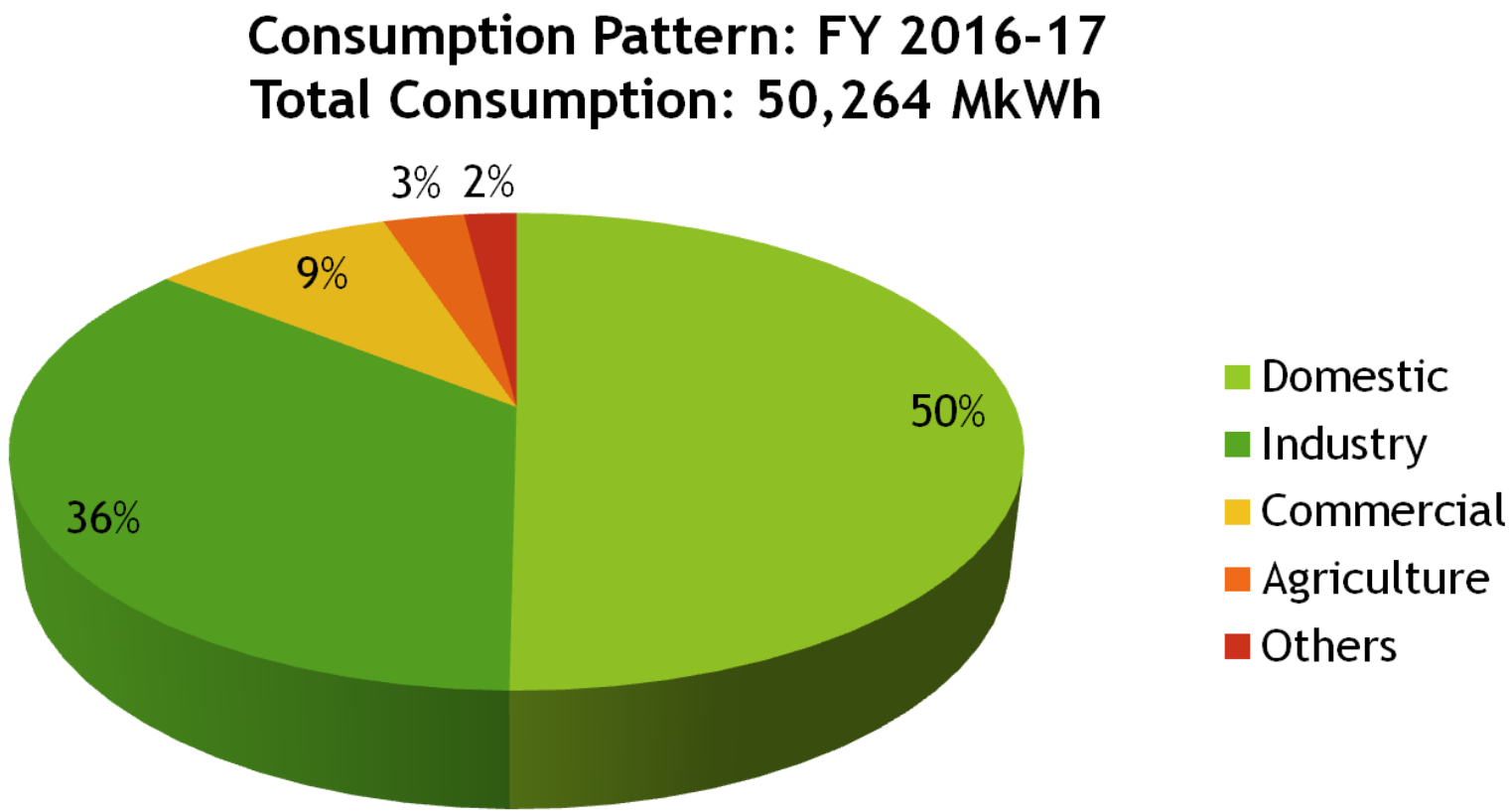
Fuel Mix: 2030



Fuel Mix: 2041



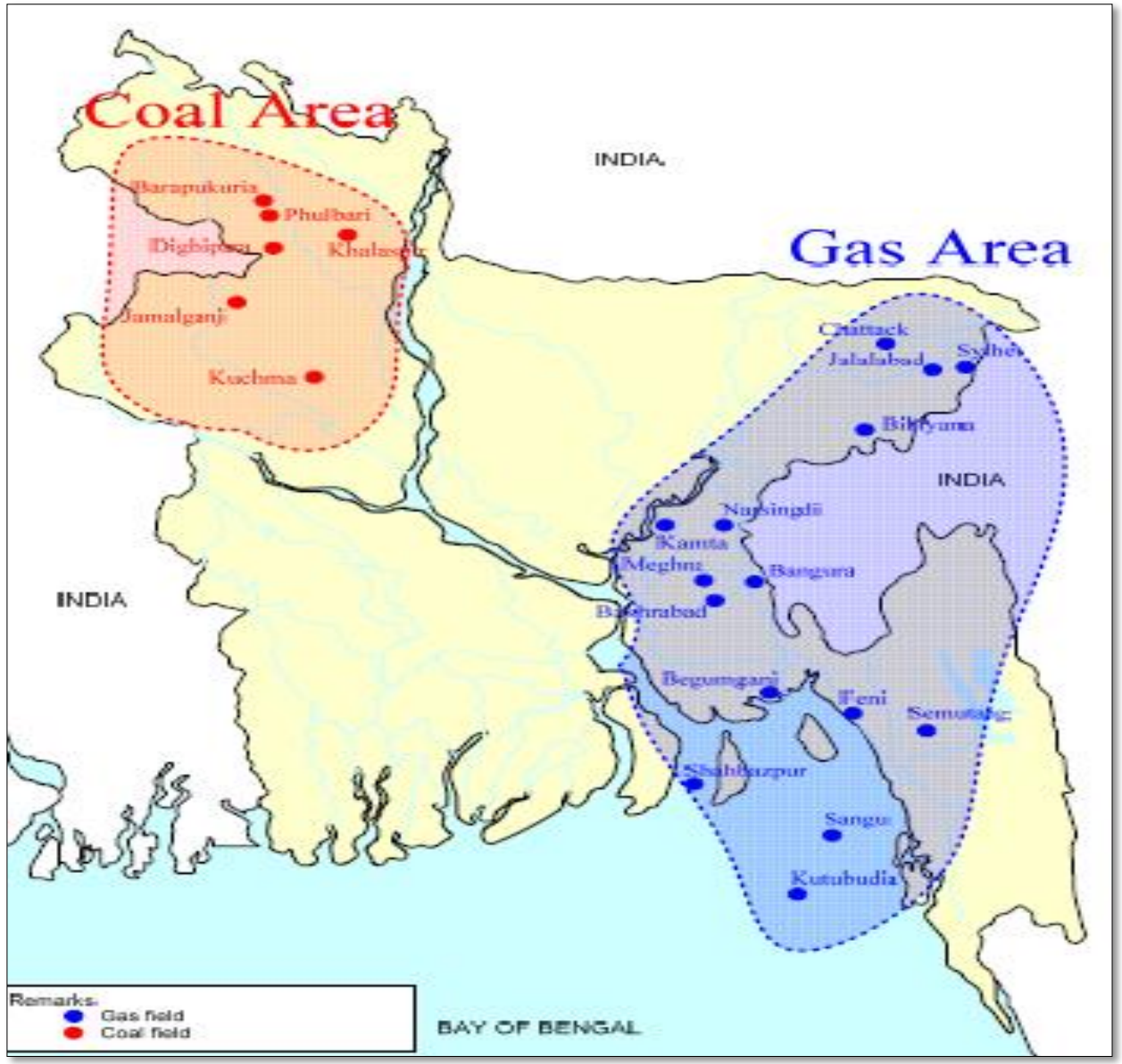
Power Consumption by Consumer



Primary Fuel Options: Indigenous Resources

- Gas: Only 12 tcf proven reserve; No significant gas discovery in recent years; Depleting gas reserve restricts gas based generation expansion; R/P ration is only about 12 years.
- Hydro: Present capacity 230 MW and average energy generation- 800 GWh; No further significant potential
- Coal: Total 3.2 billion ton reserve in 5 mines; Near term option;
- Renewable: Present capacity of Solar is only 300 MW; still high cost

Map Showing the 5 Indigenous Coal Mines



Import Options as Indigenous resources are Inadequate

- Coal Import: Indonesia, Australia, South Africa
- LNG Import: Started, Price is high
- Oil: Unstable Market and high price
- Nuclear: High initial investment cost
- Regional Power Import / Cross Border Trade: optimum use of regional resources

Regional Power Exchange

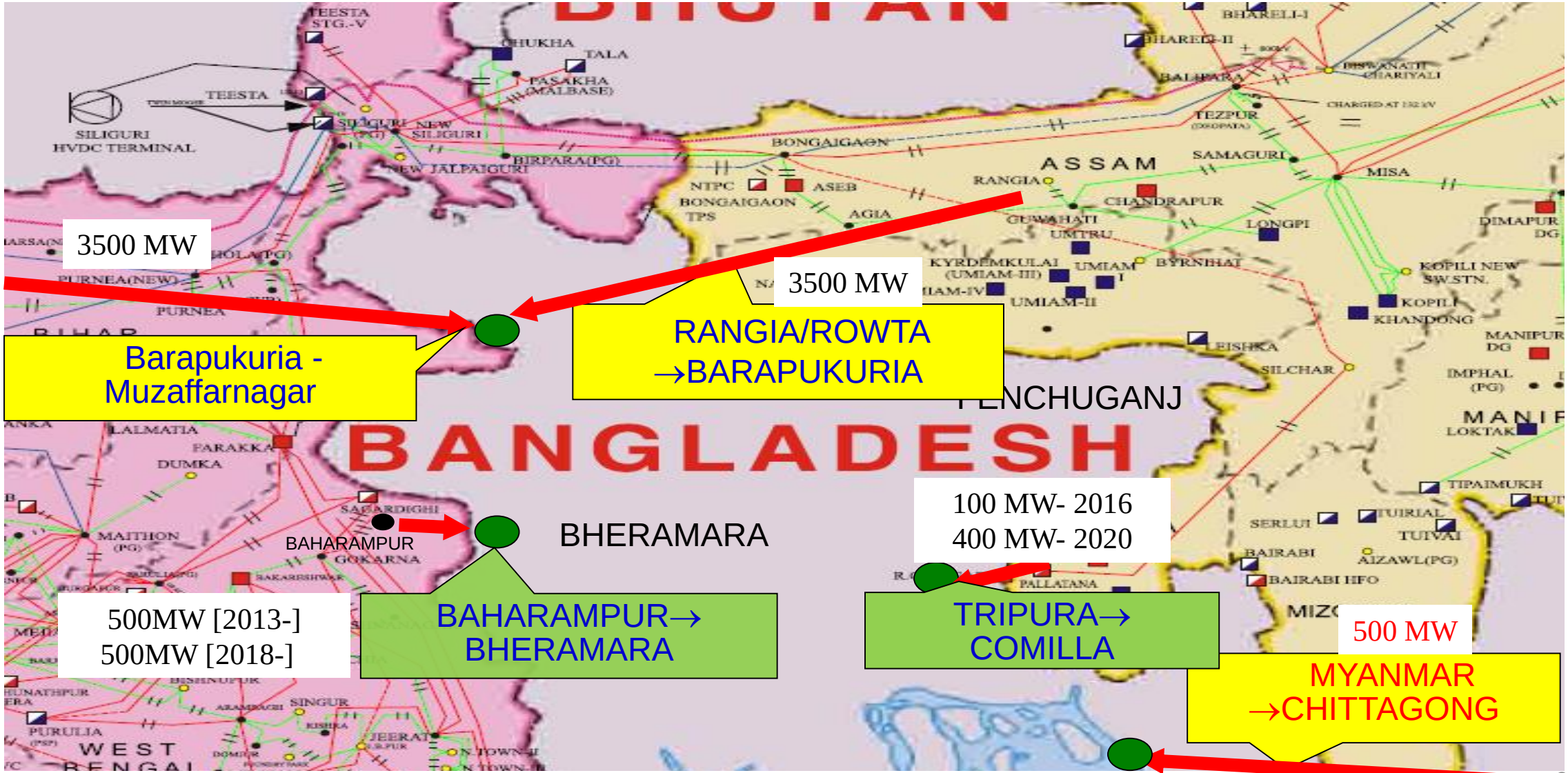
Bangladesh in Regional Cooperation

Current Status:

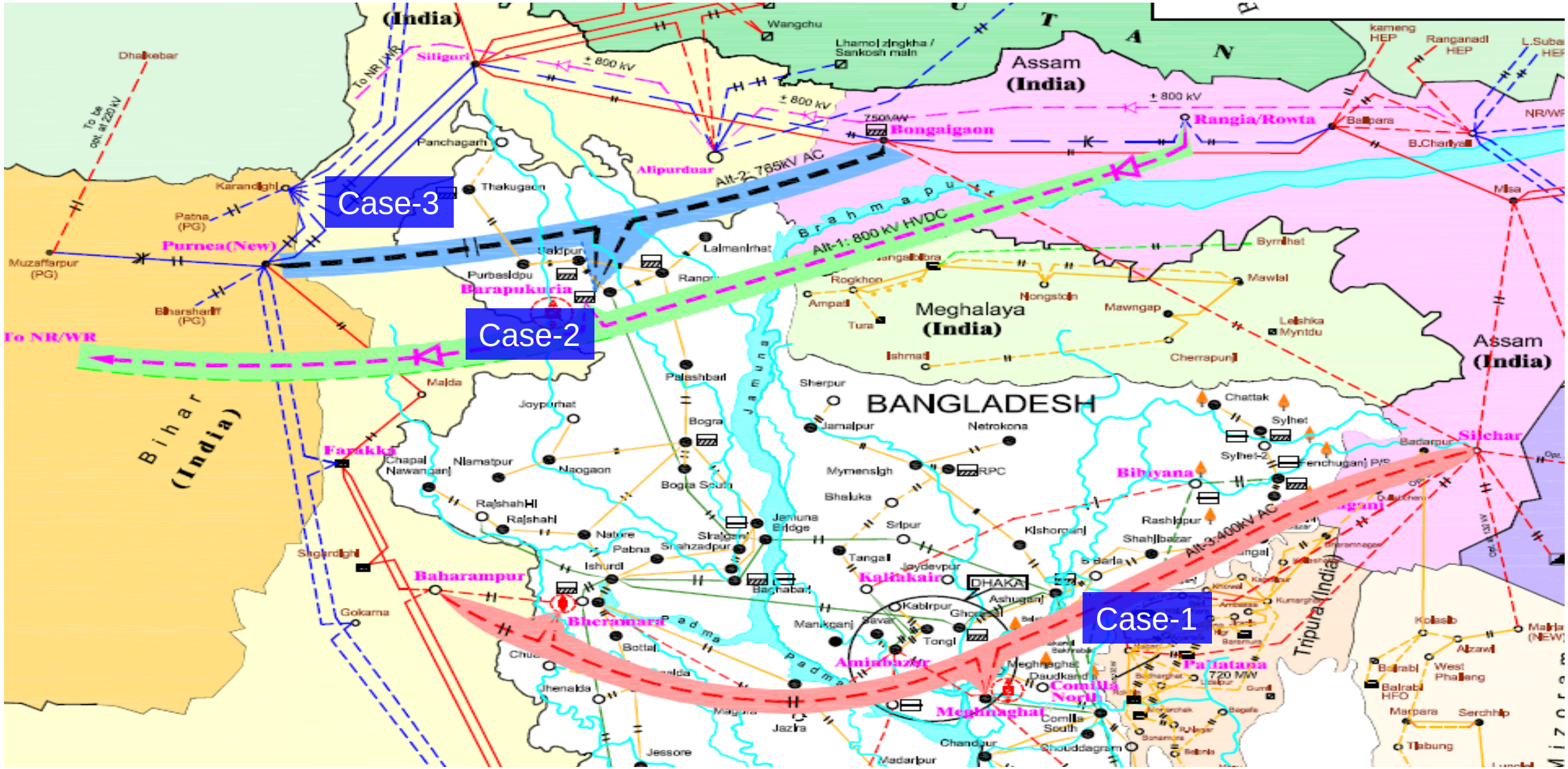
- Now Bangladesh is importing 700 MW from India
  - 540 MW (400 KV HVDC) through Bheramara (Bangladesh) – Baharampur (India) interconnection From National Thermal Power Company (NTPC), India and
  - 160 MW (132 KV Aerial mode) through Tripura (India) - Comilla (Bangladesh) interconnection from same Company.

- PSMP-2016' encompasses 9000 MW by 2041

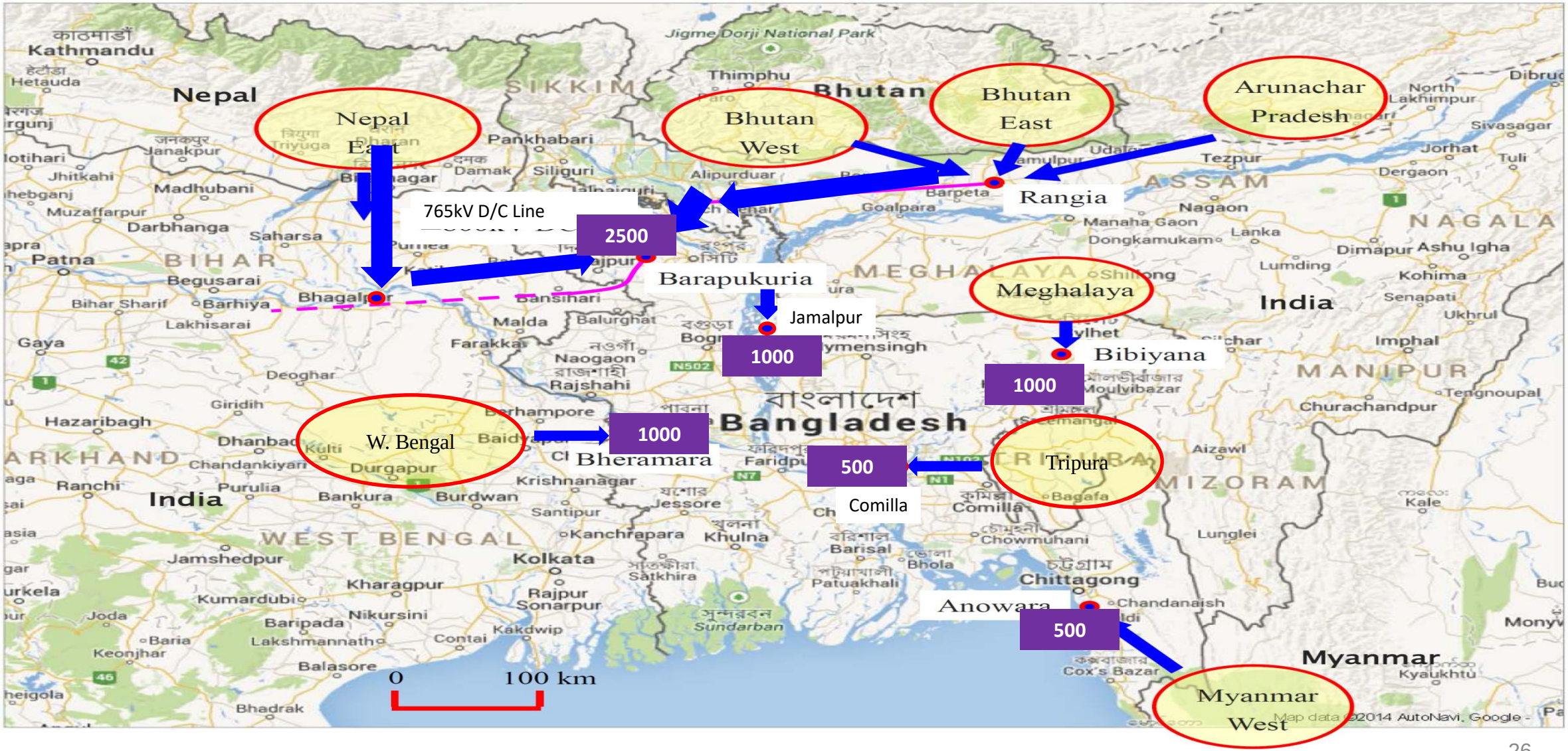
Regional Power Exchange: Possibilities



Possible Next Cross Border Interconnections



Proposed Cross border Links with Neigboring Countries by 2035 (PSMP-2016)



Challenges for Power Trade in Future

- Development of hydro power projects in Nepal, Bhutan and North-eastern India at competitive price
- Development of regional transmission inter-connections with adequate capacity
- Non-discriminatory ‘Open Access’ power flow regulation to allow power transmission through a third country
- Removal of technical and commercial barriers for power trade- like harmonization of grid codes, standards, norms, dispute resolution etc
- Establishment of ‘Regional Power Market’ is ultimate priority for maximizing benefits and to ensure energy security in South Asia

Way Forward

- To harmonize codes and standards for inter relationship
- To uphold officials amongst regulatory bodies
- To strengthen regulatory bodies through capacity building
- To collect, review, maintain and publish statistics and data
- To develop partnership with regional and global utility regulators.

Thank You

Annexure-IV

Electricity Sector in India

First Meeting of SAFIR Working Group

Colombo, Sri Lanka

15-16 May, 2018

Rashmi Somasekharan Nair,

Dy Chief (Regulatory Affairs), CERC

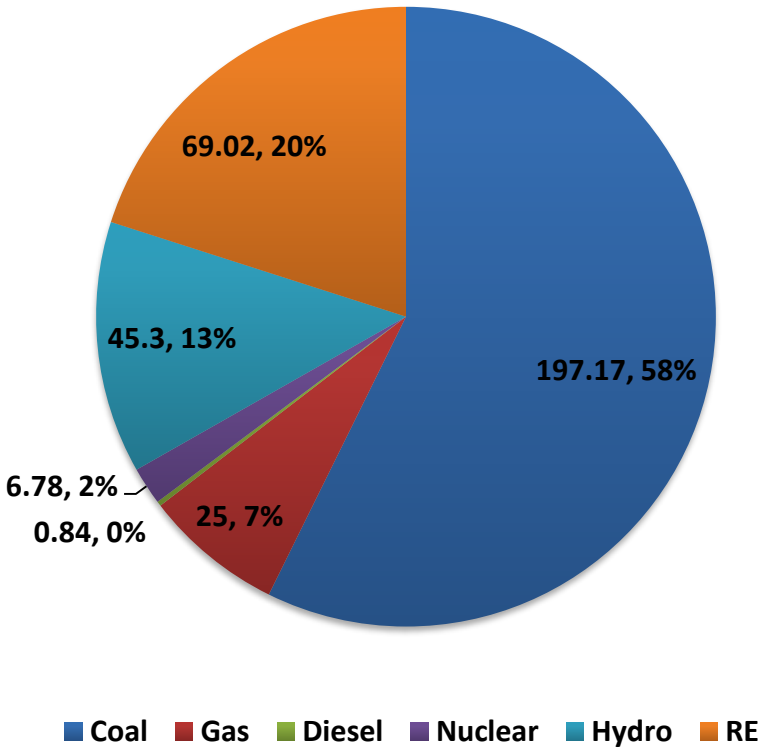
In this Presentation …..

- Electricity Industry in India - Overview
- Regulatory Framework in India
  - Role of Regulator
  - Regulatory Initiatives
- Perspective on Regulatory Co-operation

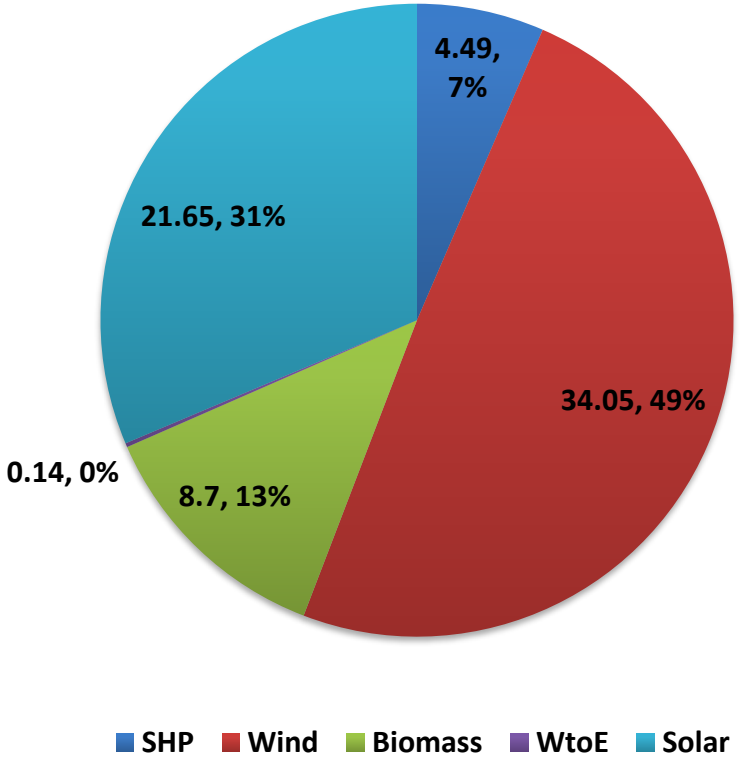
Electricity Industry in India - Overview

Installed Generation Capacity (GW)

Installed Generation Capacity 344 GW



Generation through RE Sources 69 GW



Central Sector – 24.57%; Pvt. Sector – 45.21%; State Sector - 30.22%

Growth – C[illegible]r Capita (kWh)

16.2 kWh (1947)

1075 kWh (2016)

Progress Achieved in …

Consumption per Capita

Growth – C[illegible]city (GW)

1.362 GW (1990)

344 GW (2018)

Progress Achieved in …

Consumption per Capita

Generation Capacity (GW)

Growth – RE Generation Capacity (GW)

0.032 GW (1990)

69.02 GW (2018)

Progress Achieved in …

- Consumption per Capita
- Generation Capacity (MW)
- RE Generation Capacity (GW)

Reduction in Peak Demand Deficit (GW %)

11.6 %
(1985)

2 %
(2018)

Progress Achieved in …

- Consumption per Capita
- Generation Capacity (MW)
- RE Generation Capacity (GW)
- Reduction in Peak Demand Deficit (GW %)

Reduction in Energy Deficit (BU %)

10.91 % (1987)

0.7 % (2018)

Progress Achieved in …

- Consumption per Capita
- Generation Capacity (MW)
- RE Generation Capacity (GW)
- Reduction in Peak Demand Deficit (GW %)
- Reduction in Energy Deficit (BU %)

Growth in Transmission Network (ckm)

52,034 ckm (1985)

390,970 ckm (2018)

Progress Achieved in …

- Consumption per Capita
- Generation Capacity (MW)
- RE Generation Capacity (GW)
- Reduction in Peak Demand Deficit (GW %)
- Reduction in Energy Deficit (BU %)
- Growth in Transmission Network (ckm)

Growth in Transformation Capacity (MVA)

46,621 MVA (1985)

804,458 MVA (2018)

Progress Achieved in …

- Consumption per Capita
- Generation Capacity (MW)
- RE Generation Capacity (GW)
- Reduction in Peak Demand Deficit (GW %)
- Reduction in Energy Deficit (BU %)
- Growth in Transmission Network (ckm)
- Growth in Transformation Capacity (MVA)

Transmission and Distribution Ownership

- More than 90% of Electricity Transmission in India is owned by public sector
  - Is a Regulated monopoly business
  - New projects to be awarded through competitive bidding route

- About 13% of Electricity Distribution in India is owned by private sector

Regulatory Framework in India

Evolution of Regulatory Institutions

- Powers of Regulation historically with
  - Government/Government organization

- First attempt at distancing of Government from regulation – in 1998
  - Independent Regulatory authorities responsible primarily for tariff regulation
  - CERC (central level regulator); SERCs (state level regulator); JERC (joint regulator involving two or more states/UTs)

- Paradigm shift in 2003 – Electricity Act, 2003 – Complete distancing of Government from regulation.

Role of Government

- **Formulation of**
  - **National Electricity Policy**
  - **Tariff Policy**
  - **National Electricity Policies on rural electrification.**

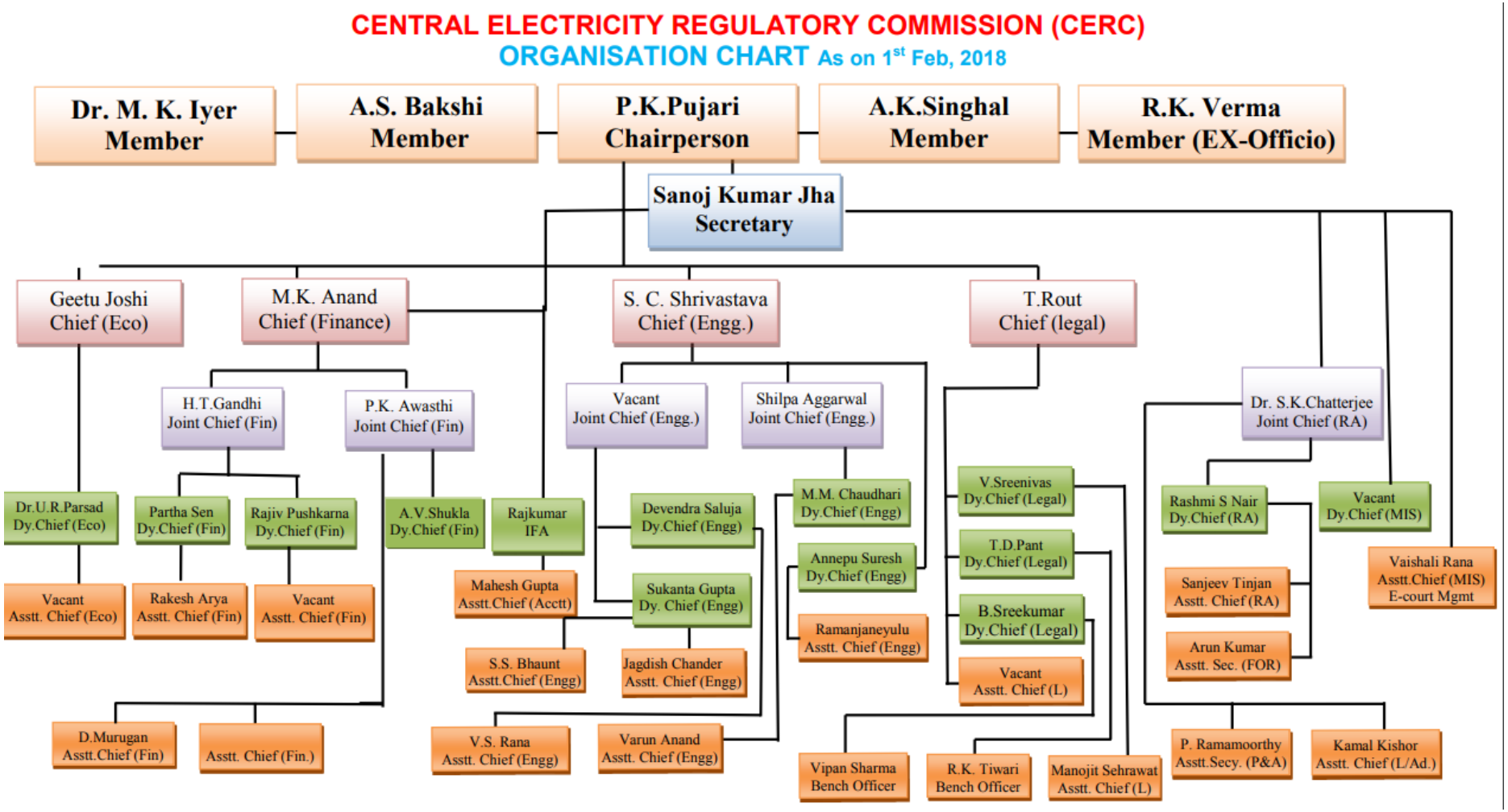
Regulatory Commission – A *Quasi Judicial* Body

- **Powers of Civil Court for the purposes of inquiry or proceedings under the Act. (Section 94)**

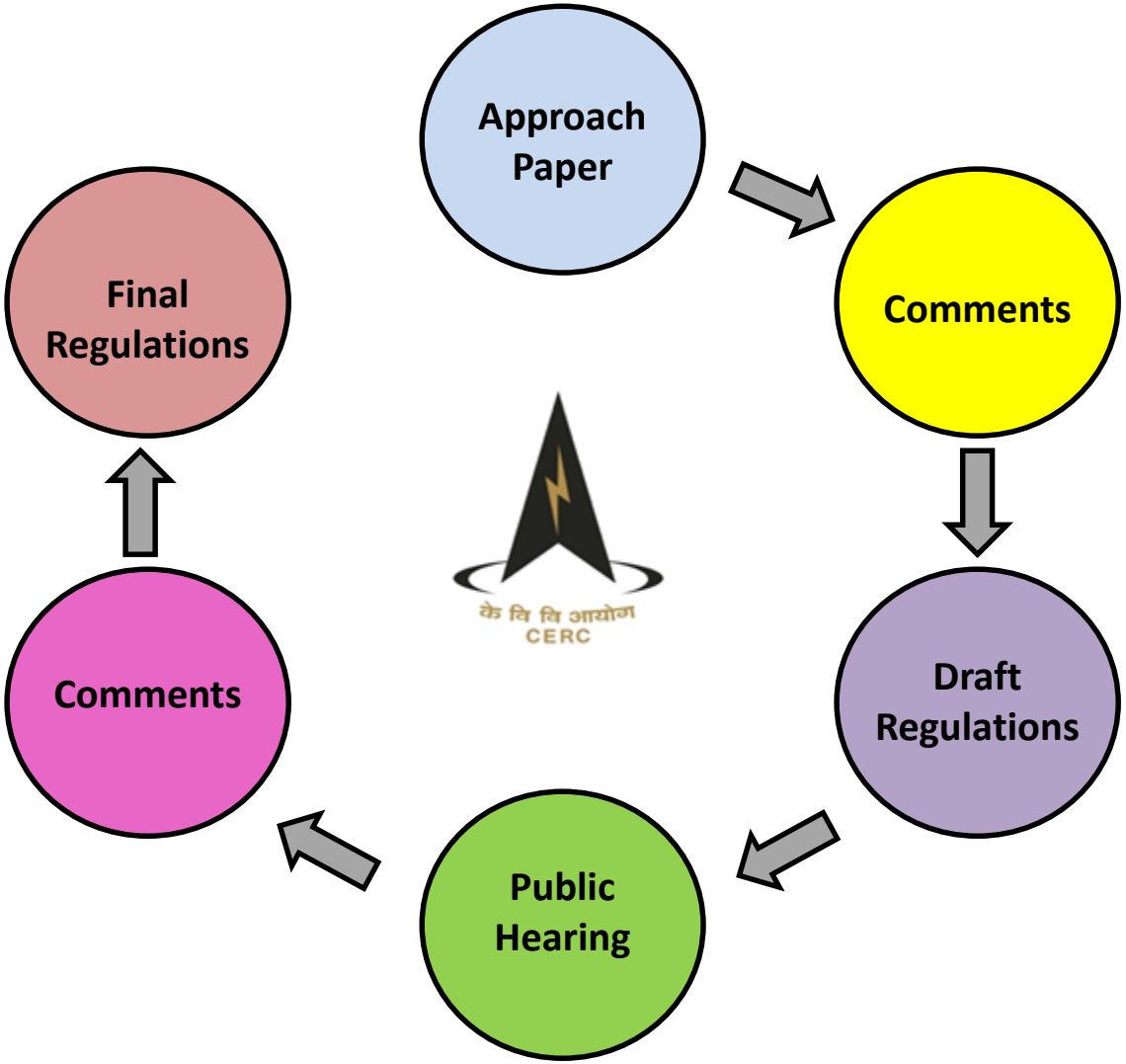
- **Powers to impose penalty for non-compliance of direction of Regulatory Commissions.**

- **Powers to adjudicate**

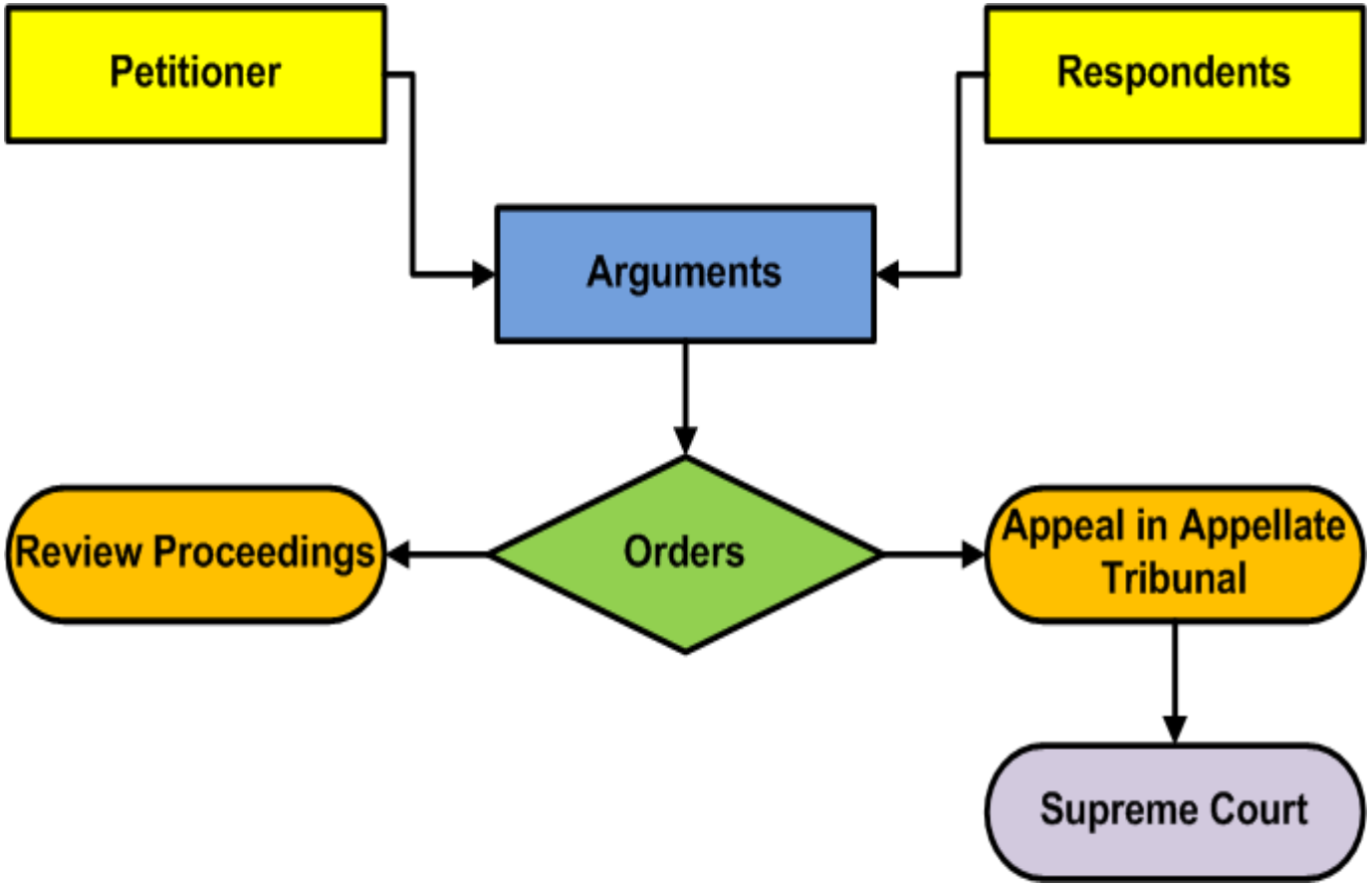
CERC Organizational Structure



Procedure for Notification of Regulation



Procedure for Disposal of Petitions



CERC – Roles & Responsibilities

- Tariff Regulation
  - Regulated Tariff
  - Competitive Bidding
- Licensing
  - Transmission, Trading, Distribution
- Development of power market
  - Facilitating Open Access
  - Licensed traders
  - Power Exchanges
- Inclusive Growth
  - Consumer Protection
  - Promotion of Green Energy

Tariff Determination

- **Tariff Determination : performance based regulation (Regulated Tariff)**

- **Adoption of tariff determined through competitive bidding (Competitive Tariff)**

Licensing

- CERC grants licence for inter-state transmission and inter-state trading in electricity
- SERCs grant license for intra-state transmission and intra-state trading and distribution
- Generation is delicensed in India

Market Development

- Enabling Framework: Non-discriminatory open access
- Framework for National Power Market

Power Trading

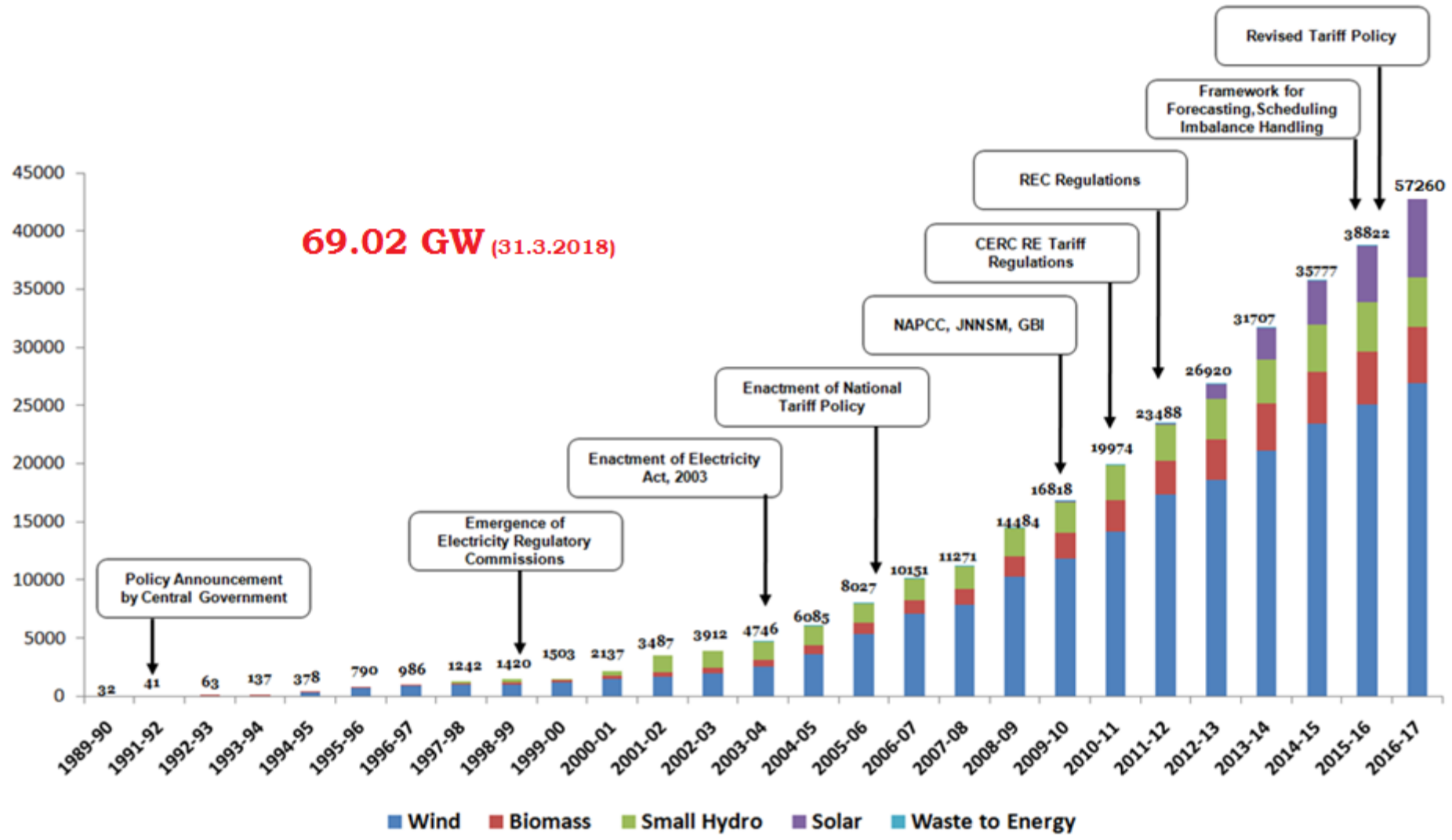
- Large number of licensed traders
- Short Term Markets – Multiple buyers and sellers
- Promoted National Level Power Exchanges

Sustainable Development : Renewable Energy

- RE Tariff Regulations
- Renewable Purchase Obligation
- Renewable Energy Certificate (REC) market
  - To boost market development in renewable.
  - Renewable Purchase Obligation (RPO) compliance by Discoms / Open Access consumer

    (RPO setting, monitoring and compliance is, however the responsibility of SERC)

Growth in RE Generation Capacity (MW)



- Regulators induce efficiency in operation through tariff framework
- Model Demand Side Management Regulations
- Bureau of Energy Efficiency driving energy efficiency measures in the country.
- CERC is also the Regulator for ESCerts which are traded on the Power Exchanges – BEE- EC Act – PAT Rules

Consumer Focus

- **Regulatory Commissions**
  - **Set and monitor Standards of Performance of Licensees.**
  - **Licensee to pay compensation to consumer for failure to comply with the standards.**
  - **Induce efficiency**
  - **Stakeholder consultation – State Advisory Committee and Central Advisory Committee**

Electricity Regulators in India have …..

- Brought Transparency in Regulatory process
- Introduced Efficiency in Operation
- Created environment to attract private investment in Generation
- Promoted Competition in generation and transmission
- Created Market Structure in power sector
- Facilitated Sustainable development through promotion of Renewable Energy & Energy Efficiency

Perspective on Regulatory co-operation

- Regular meetings amongst members of SAFIR WG
- Interaction amongst officials of Members through discussion forums on SAFIR website
- Knowledge transfer through nominated nodal officers of Executive Committee and Steering Committee of SAFIR
- Data compilation of important Regulations, Orders of each sector
- Study on selected topics – decided in the ECM/ SCM of SAFIR on 10.5.18

  - Cross Border trade in Electricity ;

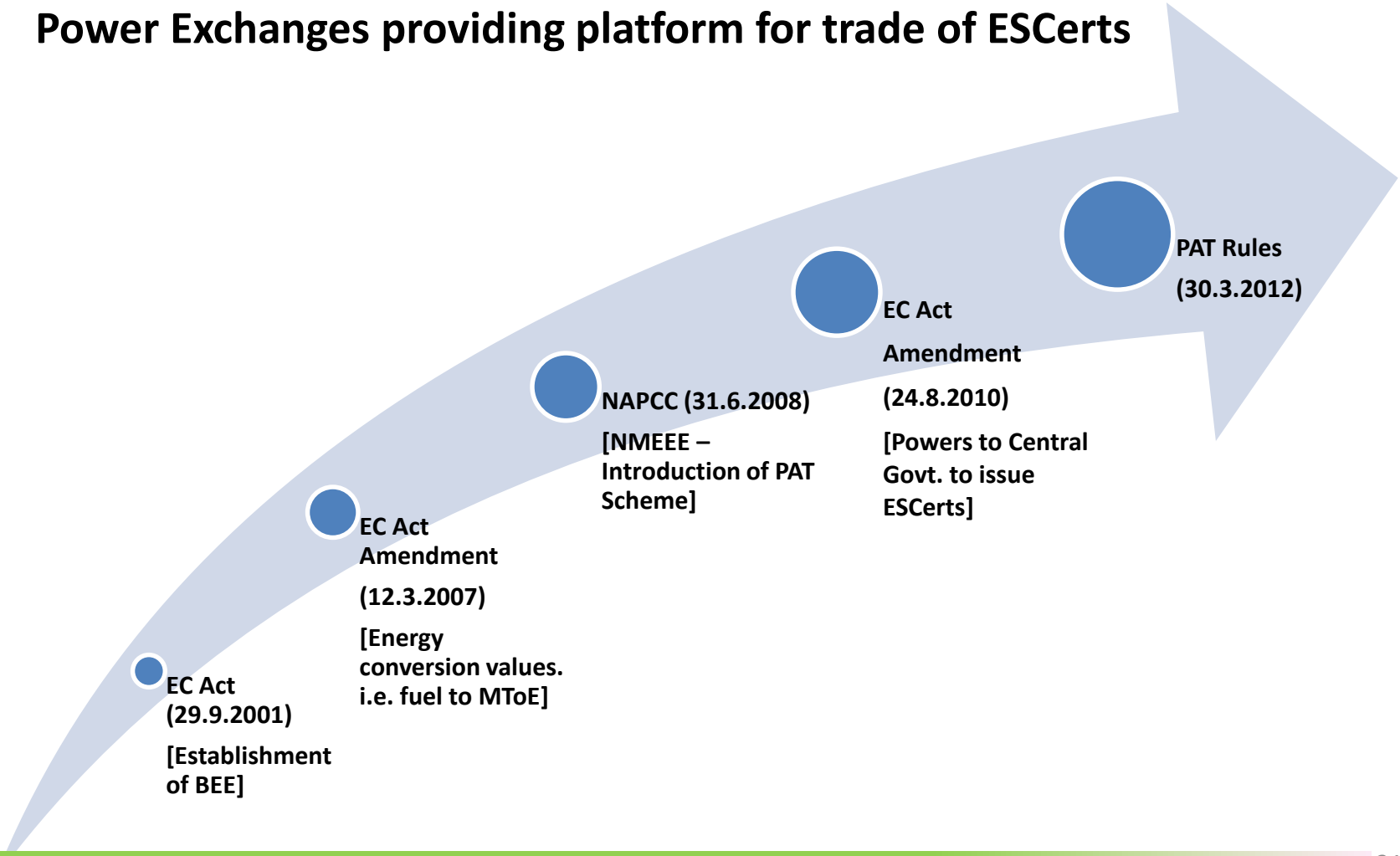
  - Regulatory interventions for Grid discipline and grid reliability in South Asian region

- Capacity building programs to supplement the flagship Core Course of SAFIR
- Quarterly newsletters

Thank You

rashmisnair102@gmail.com

- CERC - Market Regulator for Energy Saving Certificates (ESCerts)
- Regulations on ESCerts
- Power Exchanges providing platform for trade of ESCerts



Salient Features of ESCerts Regulations

- Eligible Entities (EEs) issued with ESCerts for achieving specific energy consumption less than the norms & standards
- EEs which exceed consumption norms may comply with ESCerts *in lieu* of efficiency improvement measures
- Denomination of one ESCert as per PAT Rules and equal to energy consumed in terms of one metric ton of oil equivalent (1 MToE)
- Market price of ESCerts as discovered through bidding on PXs (closed bid double-sided auction process)
- CERC determines fees & charges by EEs towards management of Registry & Software platform
- Administrator to bring instances of non-compliance of Regulations to the notice of the Commission
- Central Electricity Regulatory Commission as Regulator
  - Directions to Administrator & Registry, Approval to Power Exchanges for eligibility criteria, transaction process, price discovery mechanism, process of interaction etc.
- POSOCO as Registry
  - Registration of Eligible Entities, Maintaining records of ESCerts, Dissemination of information in coordination with the Administrator, Assistance in development of IT Platform for maintaining database of ESCerts, Signing of Non-Disclosure Agreement with the Administrator, etc.
- Bureau of Energy Efficiency as Administrator
  - Defining detailed procedure for interface activities, Registration of eligible entities and dealing, transfer and other residual matters, Assistance to the Commission, ensuring transparency in ESCerts transactions, dissemination of information to Registry etc.

Current Status of ESCerts Trading

- The trading of ESCerts on the Power exchange (IEX) has since commenced on 26th September, 2017
  - 35 buyers and 4 sellers participated in the trading
  - 10904 ESCerts were traded at a value of Rs 1.31 Cr.
  - The market clearing price discovered on the power exchange was Rs 1200 per ESCert.
- The trading of ESCerts is conducted on a weekly basis .
- In the session on 14th November 2017,
  - 12125 ESCerts were traded at a value of Rs 24 lacs and market clearing price of Rs 200 per ESCert
- As the Registry and BEE would incur costs towards the operationalisation of the ESCerts Mechanism, the Commission, in consultation with BEE, has issued an Order for the fees and charges payable by eligible entities to the Registry.
- On 19th May, 2017, in order to give an initial boost for the trading of ESCerts, at the request of BEE, a one time waiver of the registration fee of Rs. 15,000/- per application was granted for all those eligible entities who register themselves by 31.12.2017.
- The cost of this waiver is being borne by BEE

CERC E-Court : A move towards paperless Court

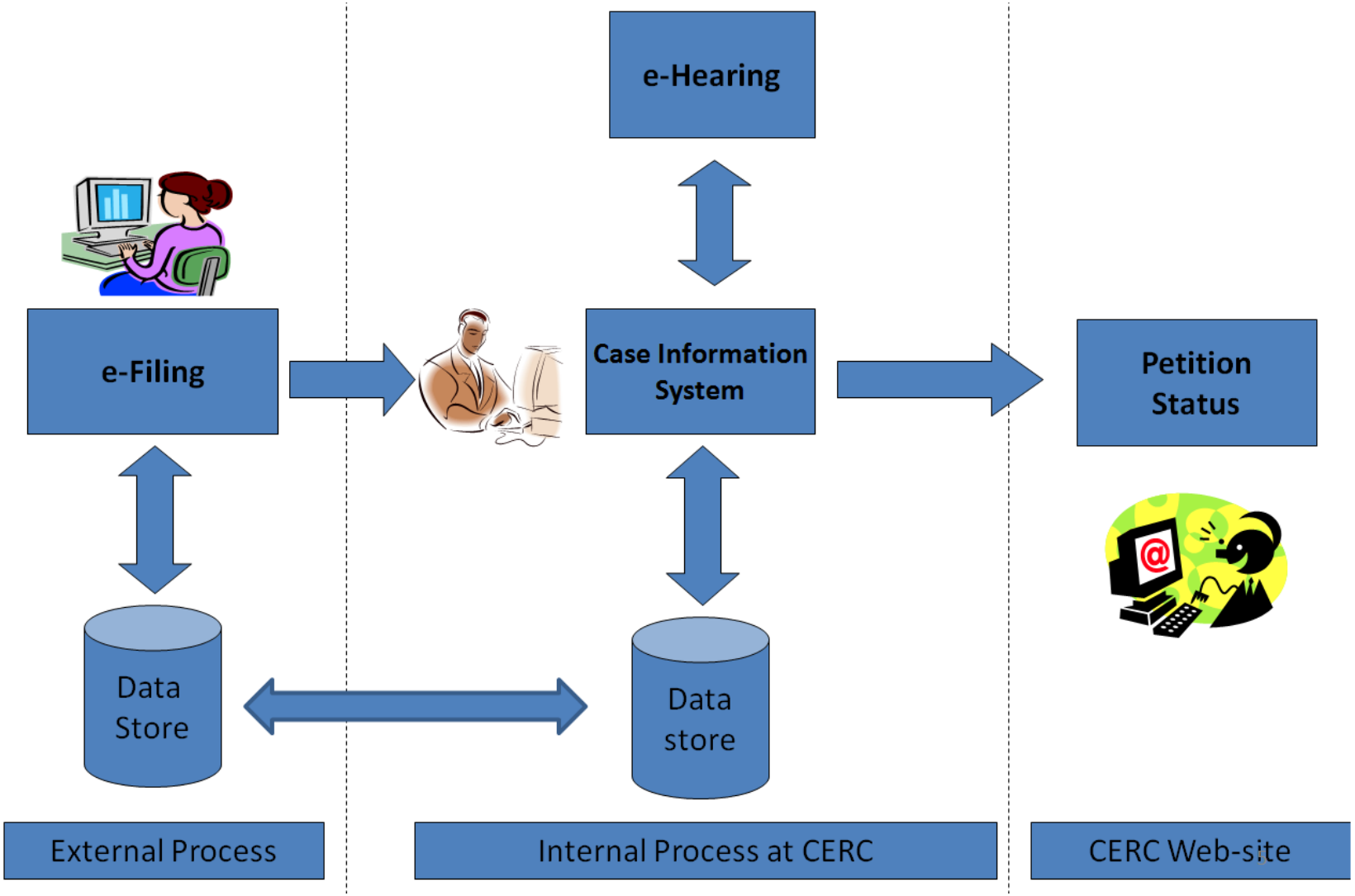
Objective

- **Increase transparency**
- **Instant filing of Petitions**
- **Increase efficiency**
- **Paper less process**
- **Improve decision making to develop the sector.**

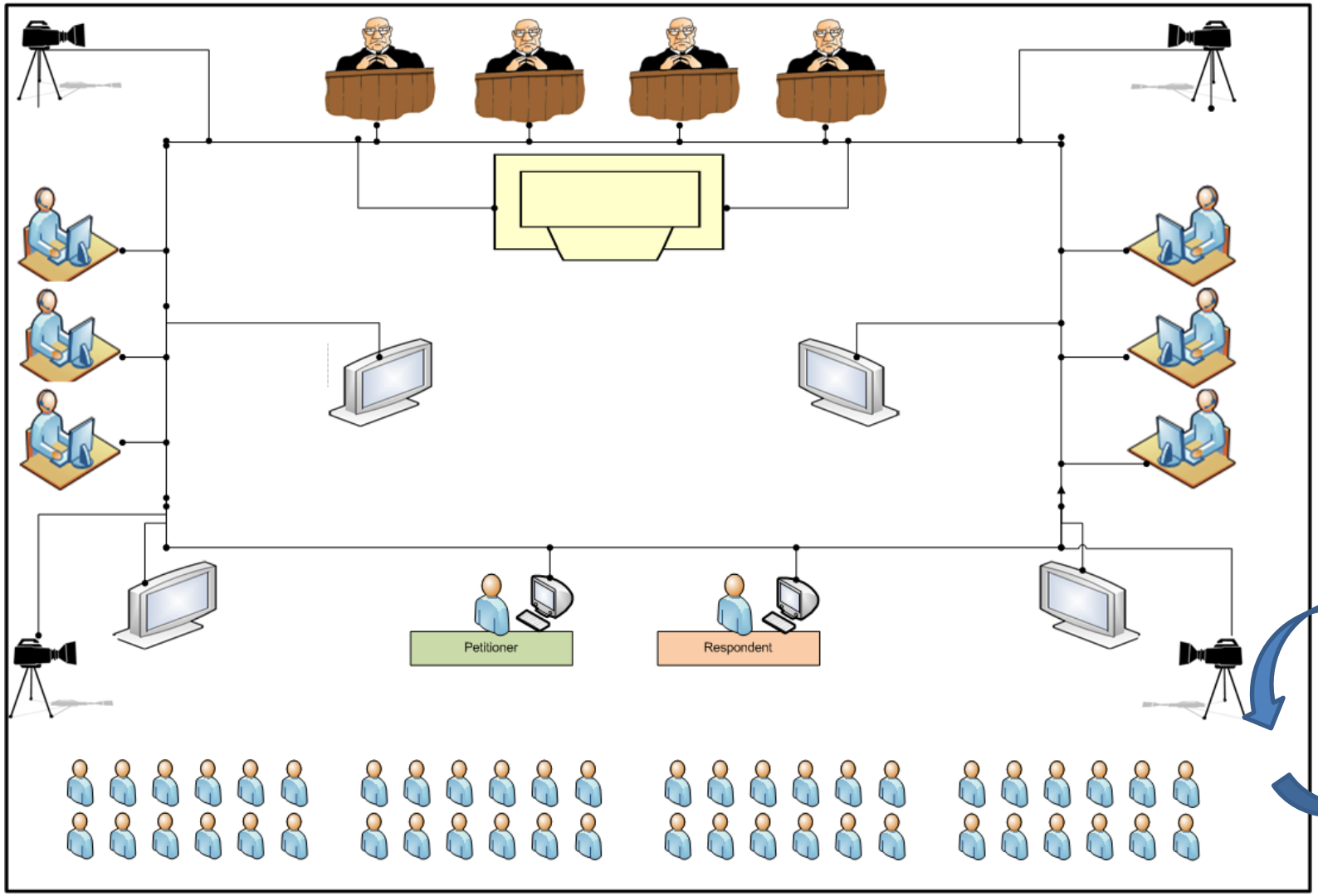
e-Filing	**Filing of petitions (soft format) on the portal**
e-Pleading	**Filing of reply, rejoinder, comments etc online**
e-Hearing	**Hearing through soft copies of petitions**
e-Library	**Digitization of records, petitions, comments etc.**
Case Information System	**Processing of petitions, Case Data and Cause list Generation**

Hearings are held generally on Tuesdays and Thursdays

CERC E-Court Process Flow



CERC E-Court Schematic Snapshot



Development of Market …

Institutional Framework for Power Market

- **Traders : License to electricity traders**
  - **Large number of licensed traders (45)**
- **Power Exchanges – Two (Since 2008)**
  - **Anonymous and Competitive price discovery**
  - **Based on real demand and supply**
  - **Electronic platform / Quick Price dissemination across country**
  - **Products : Day ahead, week ahead, intra-day / contingency, REC, ESCerts**
- **Regulations notified**
  - **Grant of Trading License; Power Market Regulations; Trading Margin Regulations; Short Term Open Access Regulations**

CERC has helped create a robust market structure

CERC Journey since 1998

- **Regulations**
  - **133 Regulations (incl. Amendments) notified since inception**
  - **41 Regulations (incl. Amendments) notified since 2014**
- **Orders**
  - **4238 Order passed till 1.2.2018**
  - **522 Orders passed in 2016-17**
  - **254 Orders passed in 2017-18 (till 1.2.2018)**
- **Advice**
  - **Policy Advice rendered to GoI on 25 occasions**
  - **Subjects *inter alia* include Competitive Bidding, Promotion of RE, Open Access, Cross Border Trade, Transmission, Grid Management etc.**

Annexure-V

PRESENTATION ON

EXISTING ENERGY / ELECTRICITY REGULATORY FRAMEWORK

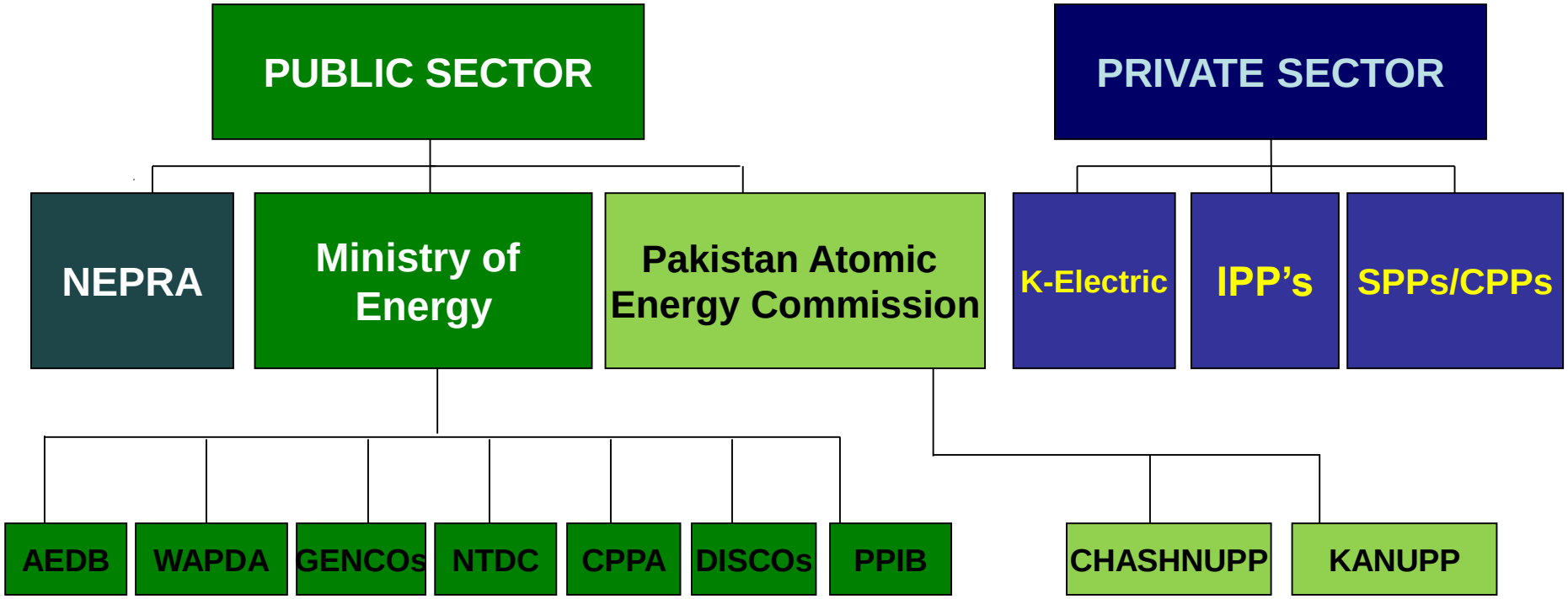
By:

SYED ZAWAR HAIDER

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY

PAKISTAN

POWER SECTOR PLAYERS OF PAKISTAN



REFORMS OF 1990s

- **De-bundling of WAPDA in GENCOs, DISCOs and NTDC**
- **Generation by Private Sector (IPPs)**
- **Establishment of NEPRA**

GENESIS

NEPRA was established through promulgation of the Regulation of Generation, Transmission and Distribution of Electric Power, Act No. XL of 1997 on 16th December 1997 (i.e. NEPRA Act).

MANDATE

The mandate given to NEPRA included:

- **To develop and pursue a Regulatory Framework that ensures provision of safe, reliable, efficient and affordable electric power to the electricity consumers of Pakistan.**
- **Facilitate transition from a protected monopoly service structure to a competitive environment.**
- **Maintain balance between the interests of the consumers and investors.**

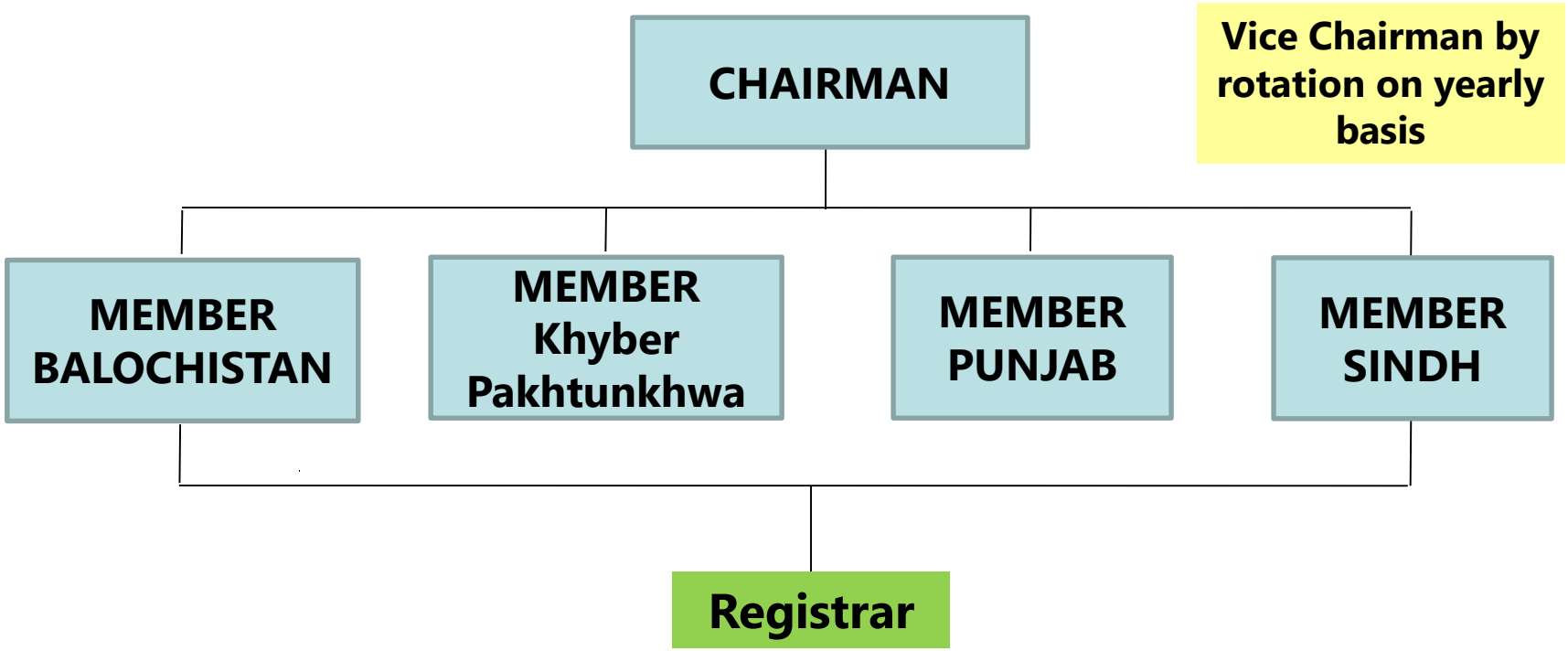
CONSTITUTION OF THE AUTHORITY

- **The Authority comprises a Chairman who is appointed by the Federal Government**

AND

- **Four Members who are also appointed by the Federal Government on the recommendations of the Four Provincial Governments**

ORGANOGRAM


CHAIRMAN
Vice Chairman by rotation on yearly basis
MEMBER BALOCHISTAN
MEMBER Khyber Pakhtunkhwa
MEMBER PUNJAB
MEMBER SINDH
Registrar

FUNCTIONS OF NEPRA

As per Section 7(1) and (2) of NEPRA Act, the Authority shall be exclusively responsible for:

- Grant licenses for generation, transmission and distribution of electric power;
- Prescribe procedure and standards for investment programs by generation, transmission and distribution companies;
- Prescribe and enforce performance standards for generation, transmission and distribution companies;
- Fines for contravention of the provisions of the Act;

FUNCTIONS OF NEPRA

As per Section 7(3) of NEPRA Act, the Authority shall:

- Determine tariff, rates, charges and other terms and conditions for supply of electric power services by the generation, transmission and distribution companies and recommend to the Federal Government for notification;
- Tender advice to public sector projects;
- Submit report to the Federal Government in respect of activities of generation, transmission and distribution companies;

REGULATORY INSTRUMENTS

- **Regulation of Generation, Transmission and Distribution of Electric Power Act** (XL of 1997): to regulate generation, transmission and distribution of electric power
- **Application Modification Procedure Regulations-1999**: to standardize the manner for submitting applications and filing petitions to NEPRA
- **Licensing Generation Rules-2000**: to streamline the process for becoming a licensee under NEPRA Act
- **Tariff Standards Procedure Rules-1998** & Fees Pertaining to Tariff Standards & Procedure Regulations, 2002: to highlight the procedure of tariff determination and standards to be adopted

To be Conti…

REGULATORY INSTRUMENTS

Continued…

- **National Electric Power Regulatory Authority Licensing (Distribution) Rules-1999 & Eligibility Criteria for Consumers of (Distribution) Companies, 2003**: to regulate the process of acquiring licenses by distribution companies.
- **Interim Power Procurement (Procedures and Standards) Regulation-2005**: to streamline the manner for acquiring permission for sale of power to transmission and distribution companies.
- **Performance Standards (Distribution) Rules-2005**: to provide standards of performance for distribution companies.
- **Performance Standards (Transmission) Rules–2005**: to provide the standards of Performance for transmission companies.
- **NEPRA Import of Power Regulations 2017**

WORKING OF NEPRA

- **Tariff**
- **Licensing**
- **Performance Standards (Monitoring & Enforcement)**
- **Consumer Affairs**

NEPRA TARIFF REGIME

NEPRA determines tariffs for the three sectors namely Generation, Transmission and Distribution:

- Tariff Determination on cost plus basis for Generation Companies.
- Upfront tariff for various technologies.
- Tariffs granted through International Competitive Bidding by relevant agencies.
- Approval of Bilateral Contracts between the Power Producer and the Purchaser.

TYPE OF LICENCES

- **Generation Licenses**
  - Generation Companies in Public Sector (i.e. GENCOs).
  - Generation Companies in Private Sector (i.e. IPPs)
- **Transmission Licenses**
  - National Transmission & Dispatch Company
  - K-Electric Limited
  - Fatima Transmission Company
  - Sindh Transmission & Despatch Company
  - Pak Matiari-Lahore Transmission Company
- **Distribution Licenses**
  - 09 XW DISCOs
  - K-Electric
  - SPPs

To be Conti…

PERFORMANCE STANDARDS

- **Performance standards are designed to encourage safe, efficient and reliable service, including standards for service characteristics such as voltage and stability and scheduled and unscheduled outages**
- **Rules are enforced though Licenses under which periodic reporting is required by Licensees**
- **Performance Audit is also envisaged by NEPRA**

CONSUMER AFFAIRS

- **Consumer eligibility criteria and Provision of distribution services**
- **Consumer Service Manual.**
- **Consumer complaint handling and Dispute resolution**

IMPORT OF POWER

- **NEPRA Import of Power Regulations have been promulgated providing framework for import of power from territories outside Pakistan**
- **Import of 96 MW from Iran ongoing**
- **Central Asia – South Asia Project (CASA-1000)**

RECENT REFORMS
(Transition To Competition)

- **Amendment in NEPRA Act.**
- **Shift from monopoly structure to competitive market (from single buyer to multi buyer).**
- **Generation business being de-regulated.**
- **Provincial Transmission and Distribution business**
- **Inter-provincial trade.**

PERSPECTIVE ON KNOWLEDGE SHARING

- **Experience sharing by regional countries can be helpful to move forward in the right direction.**
- **Need for an active forum for knowledge/experience sharing.**
- **Conferences, Seminars, Publications, Use of technology etc., may be helpful.**

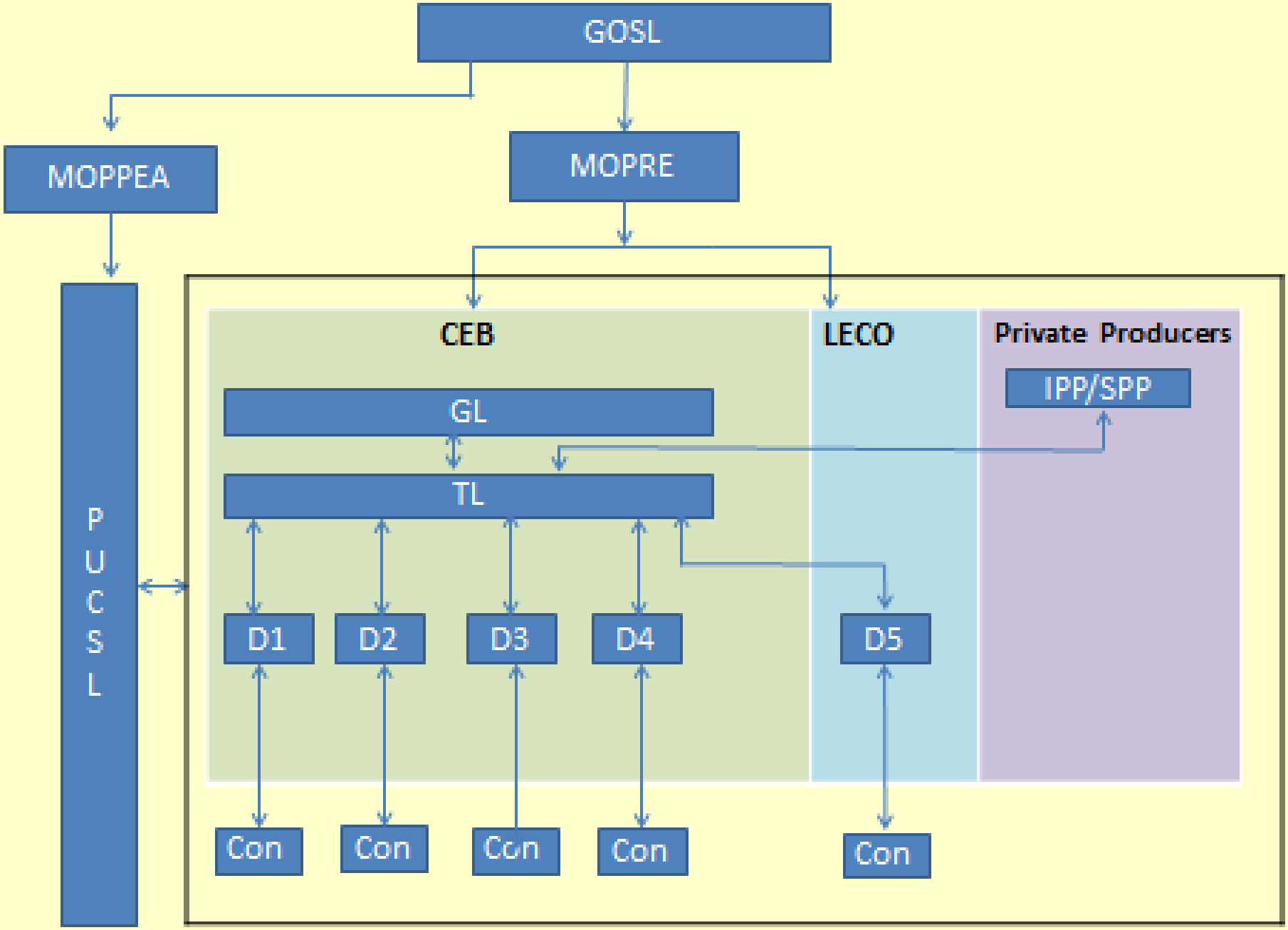

Thank You

Annexure-VI

Overview of Electricity Sector Sri Lanka

Gamini Herath

Public Utilities Commission of Sri Lanka


GOSL
MOPPEA
MOPRE
PUCSL
CEB
LECO
Private Producers
IPP/SPP
GL
TL
D1
D2
D3
D4
D5
Con
Con
Con
Con
Con

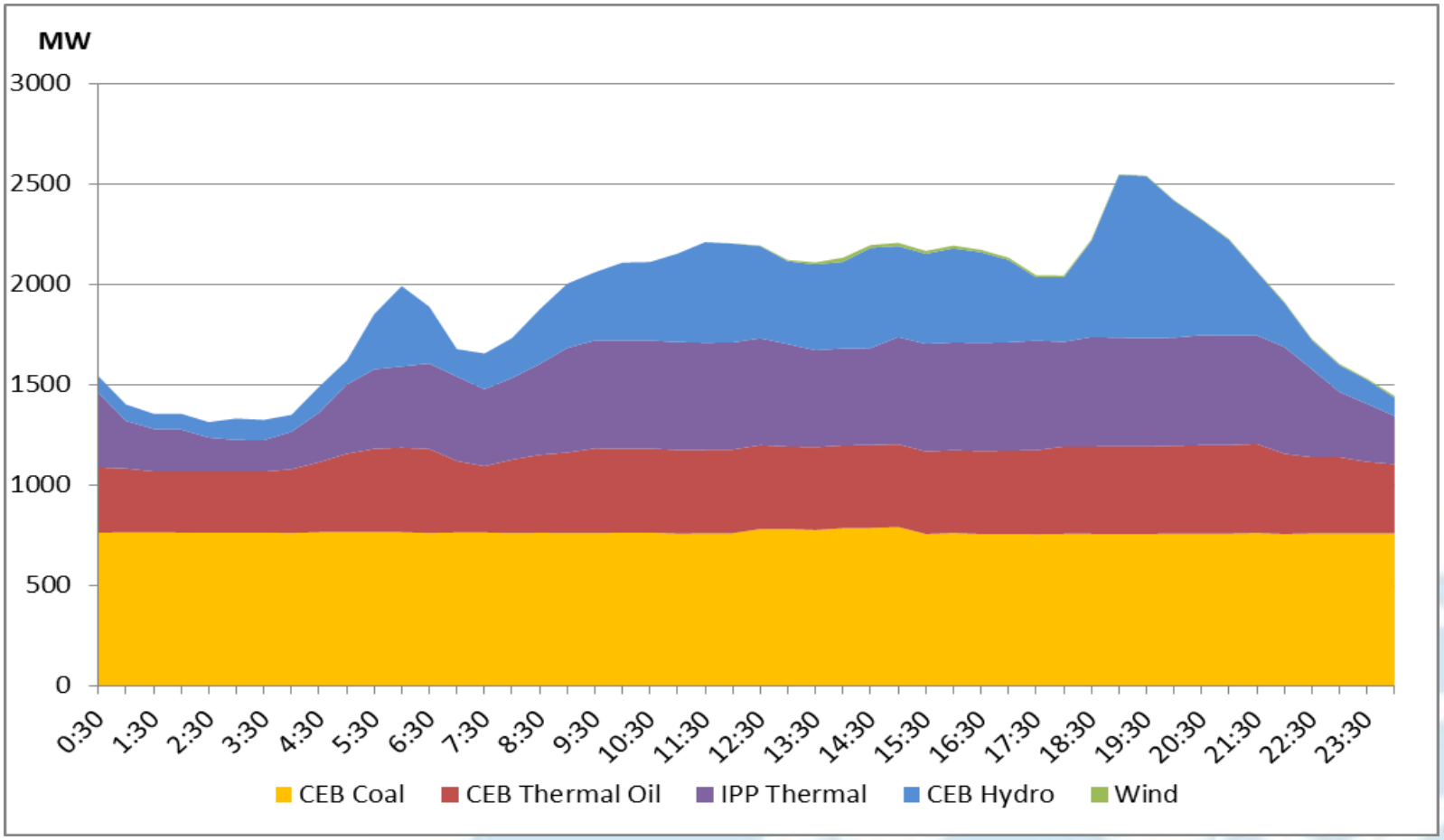
LICENSEES
(Single Buyer Model)

- Generation Licenses
  - 1 licenses - CEB Hydro & CEB Thermal
  - 3 Licenses - Private Producers (IPP) above 25 MW
  - 195 Licenses - Private Producers (SPP) below 10 MW
  - Generation exemptions for solar rooftops

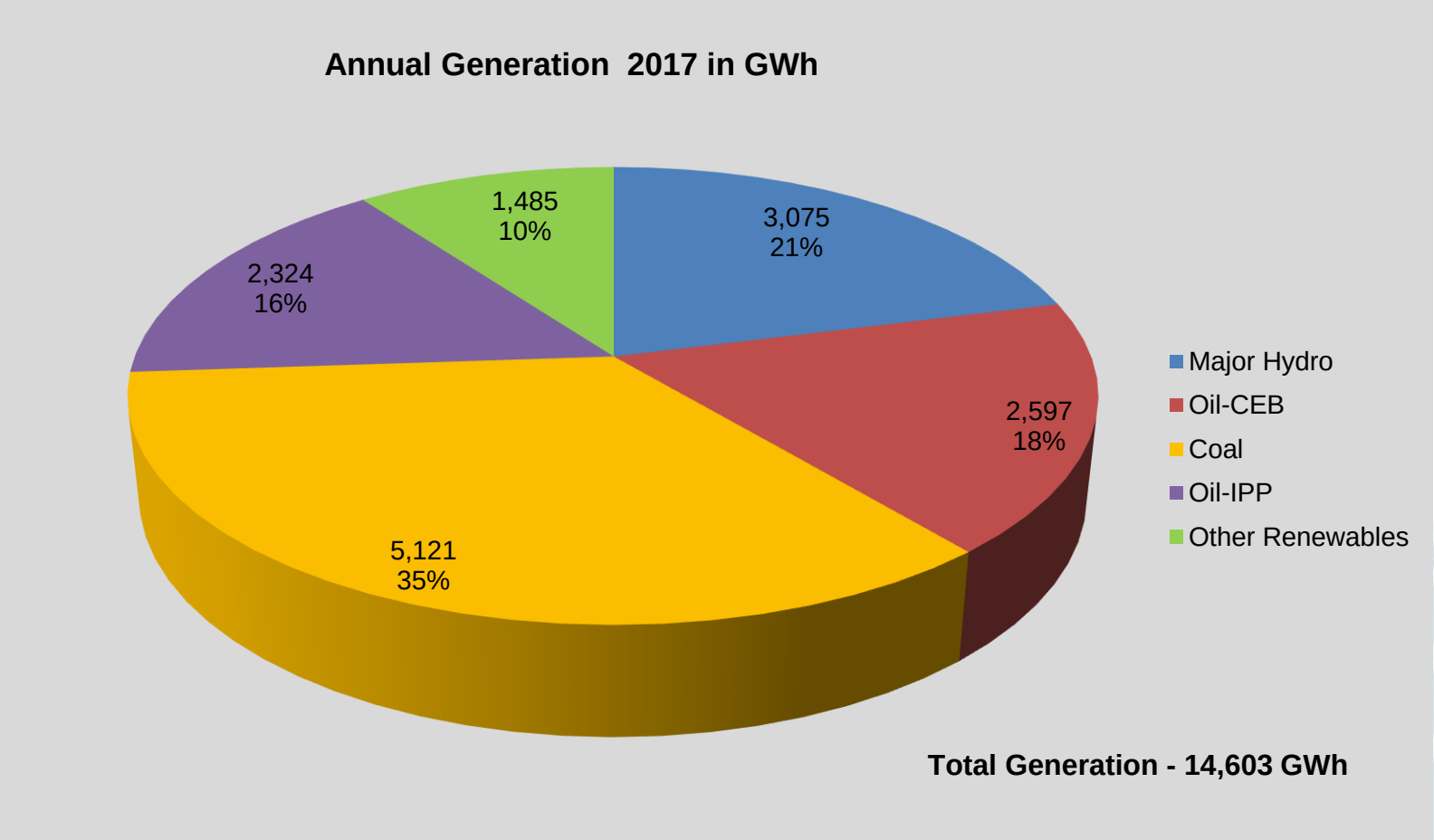
- Transmission Licenses
  - 1 License to Ceylon Electricity Board

- Distribution and Supply Licenses
  - 4 Licenses to Ceylon Electricity Board
  - 1 Licence to Lanka Electricity Company Ltd.
  - Distribution Exemptions for small scale distributors

Daily Load Profile



Annual Electricity Generation 2017



Electricity Demand

Peak Demand – 2400 MW

Daily Average Consumption -35 GWh

Consumer Category	Number of Consumers	Consumption 2015 (GWh)	% of Total
Domestic	5,322,928	4,437	38%
Religious	34,921	76	1%
Industrial	56,393	3,881	34%
Hotel	532	263	2%
General Pur.	621,602	2,923	25%
Total	6,036,376	11,582	100%

Issues in the Electricity Sector

- Adding Generation and transmission Capacity
- Enhancing the reliability of the Grid and distribution systems
- Introducing DSM measures
- Enhancing Performance of Utilities
- Consumer Awareness and education

REGULATORY INTERVENSIONS

Applicable to all Licensees

- Regulations on License Application
- Tariff Methodology (multi year)
- Rules on Consumer Consultative Committee
- Rules on Dispute Resolution
- Regulation on Electrical Inspectors
- Licensee Information Submission System (LISS)
- Safety, Continuity and Quality Regulations
- Rules on Procedure for Tariff Review
- Regulatory Accounting Methodology
- Consumer Metering Guidelines
- Regulations on Electricity Trading Arrangements between Licensees

REGULATORY INTERVENSIONS

Applicable to Transmission Licensee

- Generation and Transmission Planning Code (part of the Grid Code)
- Guideline for Bulk Supply Transactions
- Dispatch Planning Guidelines
- Transmission Performance Regulations
- Rules on Procurement of new Generation Plant and extension of existing Generation Plants
- Grid Code

REGULATORY INTERVENSIONS

Applicable to Distribution and Supply Licensees

- Consumer Right and Obligation Statement
- Supply Services Code
- Distribution Code
- Methodology for Energy Estimation
- Distribution Performance Regulations
- Demand Side Management Regulations
- Regulation on Information to Accompany Request for Supply of Electricity

THANK YOU

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Annexure-VII

South Asia Regional Initiative for Energy Integration (SARI/EI)

Presentation
on
Approved Terms of Reference of SAFIR Working Group on "Regulatory Cooperation to Facilitate Knowledge sharing, addressing Cross Cutting Energy/Electricity Regulatory Issues and Capacity Building " and Annual Work Plan

First Meeting of SAFIR Working Group 15th and 16th May, 2018
Hotel Taj Samudra, Colombo, Sri Lanka

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Contents of Presentation:

- Key Findings of the SARI/EI study Report on Regional Energy/Electricity Regulatory Institutional Mechanism in South Asia
- Back Ground of the Working Group Formation
- Objective of the working Group
- TOR of the Working Group
- Role of SARI/EI/IRADe-Technical and Knowledge Support Secretariat
- Annual Work Plan

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Key Findings of the SARI/EI study Report on Regional Energy/Electricity Regulatory Institutional Mechanism in South Asia:
Need for Regulatory Coordination and Cooperation

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Need for Regulatory Coordination and Cooperation for enhancing Exchange of Electricity/Energy in south Asia

- **Power and energy sector are regulated.**
- **SA countries have different set of regulatory practices.**
- **Various studies/literatures reveals the key requirements for enhancing Exchange of Electricity/Energy such as :**
  - Well defined & coherent energy policies
  - Supporting legal & regulatory framework
  - Common/coordinated regulatory framework
  - Standards, Procedures and protocols in technical, operational and legal matters.
  - International experience also suggest the need to form Institutional mechanism for Regulatory Coordination
  - Knowledge Sharing and Capacity Building

SAARC IGFA framework and guidelines issued by MoP,GoI recognizes the need to harmonize regulations to advance Exchange of Electricity/Energy in South Asia

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Study on Need of Institutional mechanism for Regulatory Coordination for advancing Exchange of Electricity/Energy in south Asia

SARI/EI Task Force 1 study on review and analysis of Policy/Regulation recommended to form a Regulatory Institutional Mechanism such as South Asia Forum of electricity Regulators(SAFER) to coordinate cross cutting of Regulations to promote cross border electricity/energy exchange in south Asia Region. The study also proposed a set of Regional Regulatory Guidelines (RRGs) which aim to

- ✓ Establish transparent regulatory environment to promote Exchange of Electricity/Energy in south Asia
- ✓ Provide a common course of action that can be referred for decision making on Exchange of Electricity/Energy in south Asia by the regulators in their respective countries
- ✓ Ensure consistency in the transactions and remove delays on account of unclear and complicated regulatory regimes

- ✓ Key findings of the study was presented and discussed in stakeholder Roundtable consultation meeting held at Delhi, India on 06th August 2015, wherein CERC, SAARC Energy Centre, BERC-Bangladesh, Ministry of Economic Affairs-Bhutan, IREDA, PTC, IEX; PFC; REC, NHPC, POSOCO participated.

- ✓ The meeting concluded/recommended that SARI/EI to carryout study/report on the regulatory institution identifying its role, institutional structure and functions including international experience.

Study on Need of Institutional mechanism for Regulatory Coordination for advancing Exchange of Electricity/Energy in south Asia : Brief Scope of Work of the study

- ✓ Analyse the various existing forums/institutional mechanisms prevailing in South Asian Countries such as South Asia Forum of Infrastructure Regulation (SAFIR), SAARC, BIMSTEC etc. and their role, responsibilities, structure, function etc. with a view of coordination of electricity regulations to promote Exchange of Electricity/Energy in south Asia.

- ✓ Review and analyse the international experiences in formation of regulatory forums/institutional mechanisms including their structure, role /responsibilities, functions etc. for harmonization/coordination of electricity regulations from the perspective of trade of electricity.

- ✓ Based on the above analysis, recommend a suitable Electricity Regulatory Institutional Mechanism in South Asia Region covering its rationale, role, function, operating structure (including working groups, expert committee etc.) and legal status.

- ✓ Develop a Road Map with a clear action plan on mechanism on Regulatory Coordination and Cooperation for advancing Exchange of Electricity/Energy in south Asia .

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International experiences on electricity regulatory agencies/associations/forums

A snapshot of international experiences

Region	EUROPE	Greater Mekong Sub-region (GMS)	Western Africa	Southern Africa
Name of Institution	Agency for Cooperation of Energy Regulators (ACER)	Regional Power Trade Coordination Committee(RPTCC)	ECOWAS Regional Electricity Regulatory Authority (ERERA)	Regional Electricity Regulators Association of SA(RERA)
Geographical area	28 - Countries Community body for integration of EU markets in electricity and natural gas	6 –Countries Responsible for establishment of Greater Mekong Sub-region (GMS) regional power market.	14- Countries Independent electricity regulator in Western Africa	13- Countries Association of electricity regulators, for politico-economic integration of SADC states
Organization Structure	Director supported by Working and Expert Groups. Director- Manages and represents Agency. Board of Regulators, Administrative Board, Board of Appeal. Five Departments- Director office, Admin, Electricity, Gas & Market Monitoring	Two Groups: The Focal Group(FW)- Coordination & implementation activities. The Planning Working Group(PWG)- Identify priority connection, standards etc. FG and PWG representative of Govt. utilities	Regulatory Council supported by a pool of experts. Council supported by Technical unit & HR/Admin/Finance. Regulatory Council- Three members headed by Chairman & two members. Fixed term of 5 years.	RERA reports to SADC Directorate of Infrastructure Services. Governed by Regulatory Council consists of three members. Technical unit-deals with Regulatory activities ; HR, Admin and Finance unit.

International Experiences: key focus areas of electricity regulatory forums/Associations

Area	ACER	RPTCC	ERERA	RERA
key focus areas	Foster cooperation among National Regulatory Agencies (NRAs), Ensure market integration, Harmonisation of regulatory frameworks, Issues non-binding opinions to NRAs	Basic rules for bilateral trading, Overall policy on day-to-day management of power trade	Regulations of Cross Border Electricity exchange, Monitor regional market; Assist NRs on capacity building & technical issues.	Regulatory Guidelines, Regulatory cooperation, Capacity building & information sharing on Cross Border Electricity Exchanges
	System operation framework, frame guidelines , Harmonisation of transmission tariff Structures	Establish short, medium, long term initiatives for Cross border Energy Exchanges	Tariff setting methodology for regional power pool	Transmission pricing, operating agreements, Balancing market operations; Ancillary services
	System operation, connectivity, capacity allocation, network codes	Identify steps for expansion	Technical regulation of regional power pooling, effective DR methods	Grid codes Procedures
Funding Support	EU	Multilateral support, WB/ADB support	Member states	Multilateral support, USAID

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Key Findings of the SARI/EI study Report on Regional Energy/Electricity Regulatory Institutional Mechanism in South Asia: Conclusion and Way Forward

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Conclusion & Way Forward: Options for Regulatory Institutional Mechanism in South Asia

Option
Option I: Within existing regional body/forum/association
Option II: Independent body/forum /association

Option I is more practical as it will Fast track the Regulatory Coordination and Cooperation for advancing Exchange of Electricity/Energy in south Asia

In future, there is need to establish a full fledged Regional Regulatory association/forum

Constituting a Working Group Under the existing South Asia Forum of Infrastructure Regulations (SAFIR) will facilitate Cooperation on Knowledge sharing, addressing Cross cutting Energy/Electricity Regulatory Issues and Capacity Building in South Asia to begin with .

Background of the SAFIR working Group formation

- Based on the recommendations of the Report, SARI/EI/IRADe made a detailed presentation/Proposal on "Mechanism for Regulatory Cooperation to Facilitate Knowledge sharing, addressing Cross cutting Energy/Electricity Regulatory Issues and Capacity Building in South Asia" to SAFIR Steering Committee and SAFIR Executive Committee Meeting held at New Delhi on 12th May'2017 :
- The proposal for creating working group under SAFIR was subsequently accepted by SAFIR.
- SARI/EI/IRADe drafted the TOR of working Group in consultation with SAFIR Secretariat.
- The TOR of working group was approved by SAFIR.

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Objective of the SAFIR Working Group

Objective of the SAFIR Working Group

The SAFIR Working Group will work towards enhancing Regulatory Cooperation to Facilitate Knowledge sharing, addressing Cross cutting Energy/Electricity Regulatory Issues and Capacity Building in South Asia to facilitate transparent regulatory framework, promoting investment in the South Asia Region

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TOR of the Working Group under SAFIR

TOR of the SAFIR Working Group

- To facilitate regulatory capacity building among member countries at both national and regional levels through information knowledge sharing and skills training.
- To facilitate the development of electricity/energy regulations by identifying and addressing cross cutting energy/electricity regulatory issues for advancing Exchange of Electricity/Energy in South Asia region.
- To provide inputs on policy & regulations/regulatory opinions/regulatory guidelines and to develop model regulations.
- To undertake research work on issues relevant to electricity /energy sector regulation through in-house/outsourcing.

TOR of the SAFIR Working Group

- Prepare a detailed road map along with various regulatory interventions needed in South Asian countries for effective energy cooperation in the region to prepare annual status report and updates on regulatory cooperation in the South Asia Region.
- Create data bank/knowledge repository on energy/electricity related issues.
- Prepare South Asia Energy/Electricity Regulatory Compendium.
- To develop web portal on “South Asia Energy/Electricity Knowledge Resource Database”.
- SAFIR–Regulatory Monthly Newsletter to enhance regulatory knowledge sharing.
- Any other work assigned by SAFIR

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Role of SARI/EI/IRADe-Technical and Knowledge Support Secretariat

Role of SARI/EI/IRADe-Technical and Knowledge Support Secretariat

- Integrated research and Action for development (IRADe) is an Advanced Research Institute and a regional think tank who has done pioneering work in the area of Electricity/Energy exchange and Energy Cooperation (EC) in South Asia Region.
- IRADe, the implementing partner of USAID for the SARI/EI Program will provide Technical/Knowledge through in-house /outsource as per the needs and financial support/assistance to the SAFIR Working Group under USAID's SARI/EI Program.
- IRADe to prepare the work plan in consultation with SAFIR secretariat and shall take inputs/suggestion of working group members for finalization.
- Presently, the Project Director and Program coordinator will be responsible from IRADe for all support to the SAFIR working group and shall strengthen the team based on need and requirements of future activities

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Annual Working Plan for 1st Year

Annual Work Plan for 1st Year

- Organizing two/three meetings of SAFIR Working Group in a Year.
- Study /Research on South Asia electricity/energy regulations to develop regulatory pathway/Road Map for Electricity/Energy exchange and Energy Cooperation (EC) in South Asia.
- Organizing "South Asia Energy Sector Training and Capacity Building program on energy regulation for Energy Cooperation and exchange of electricity in South Asia "
- South Asia Energy/Electricity Regulatory Compendium.
- SAFIR-Regulatory newsletter and web portal "South Asia Energy/Electricity Knowledge Resource Database"

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Session -4
Brain Storming session on Strategy and Action Plan for Implementing the Activities of Annual work Plan.

Thought for Discussions:

- Suggestion for implementing the 1st year Annual Work Plan?
- How SAFIR working group members can mobilize itself for addressing cross cutting of Regulations?
- Suggestions/ideas on type of Capacity Building Program needs to be undertaken to strengthen the capacity of the members/national regulators on CBET?
- Suggestion on sharing of regulatory information/data ?
- Suggestions to enhance coordination/cooperation between SAFIR working group members.
- Need for model regulations/compendium .
- Content and design of the SAFIR-Regulatory newsletter
- Structure, content, design of the Web portal/dash board on "South Asia Energy/Electricity Knowledge Resource Database"

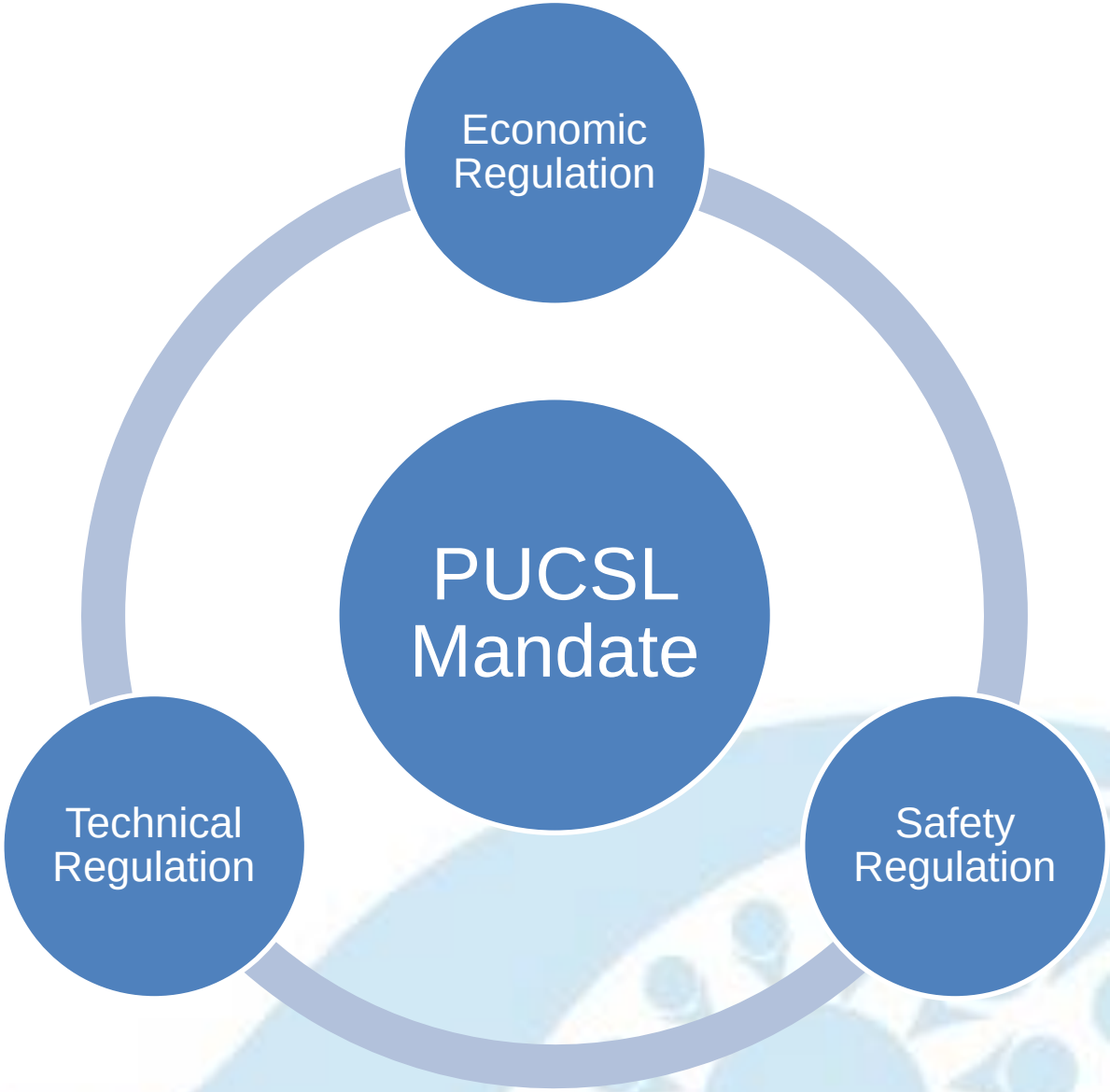
Annexure-VIII

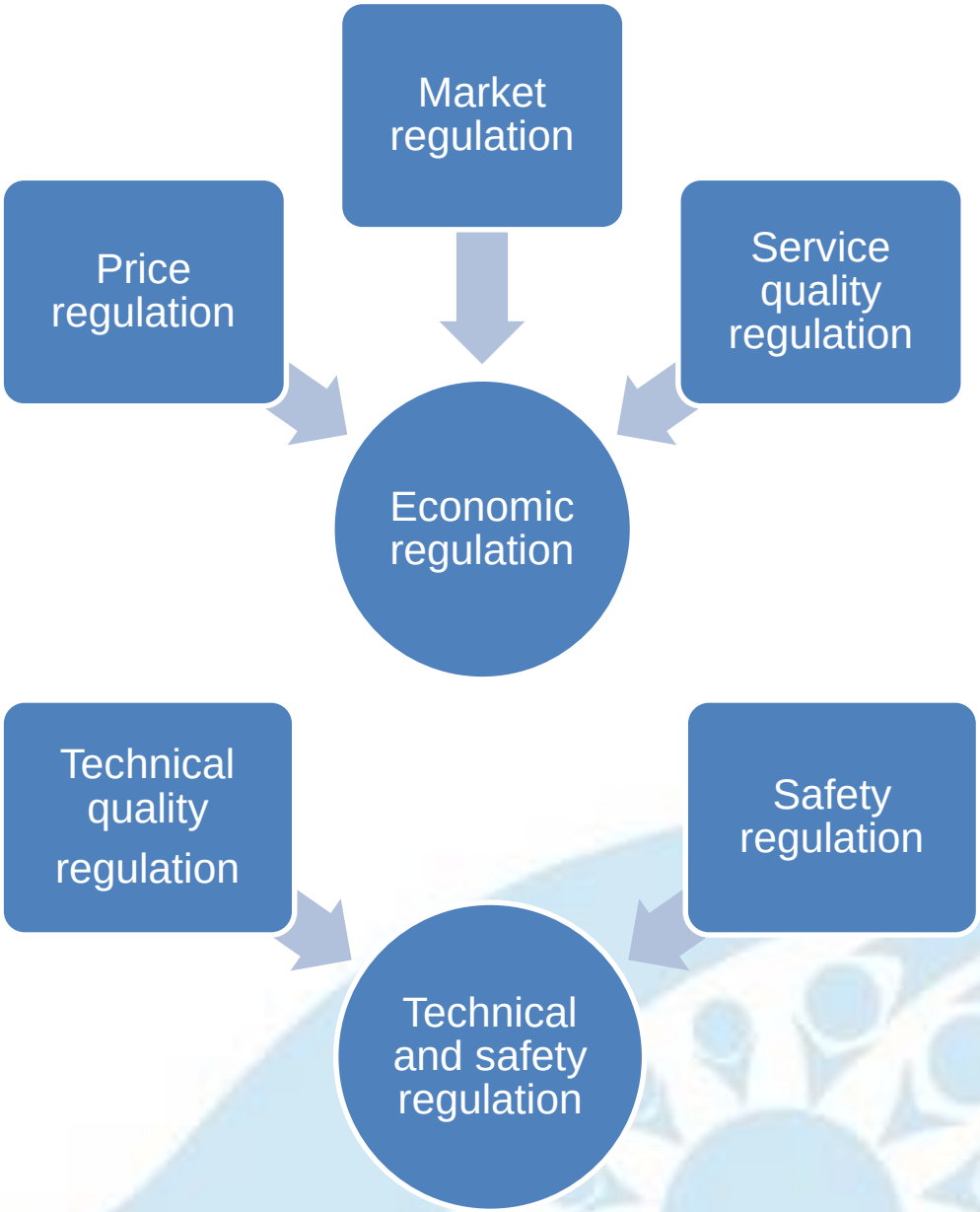
Regulation of the Electricity Industry in Sri Lanka

Regulatory Affairs Division:

Overview of Functions

16th May 2018


Economic Regulation
PUCSL Mandate
Technical Regulation
Safety Regulation


Market regulation
Price regulation
Service quality regulation
Economic regulation
Technical quality regulation
Safety regulation
Technical and safety regulation

Role of the Regulatory Affairs Division

Develop, and review from time to time, Regulations, Rules, Codes, Standards, Licenses, Methodologies and other Regulatory Tools required for economic, technical and safety regulation of the electricity industry

Regulatory Tools

- Regulations
  - The Minister, on the recommendation of the Commission, makes regulations under an industry Act for purposes setout therein
  - All such regulations made are published in the *Gazette,* and come in to force on the date of such publication or on such later date as maybe specified therein
  - Regulations require the approval of the Parliament to continue in force
- Rules
  - The Commission makes rules under an industry Act for the purposes setout therein
  - All such rules made by the Commission are published in the Gazette and come in to force on the date of such publication or on such later date as may be specified therein

Regulatory Tools Contd.

- Codes
  - The Commission approves and regulates the implementation of technical and operational codes developed by licensees in respect of matters required or authorized by the Electricity Act and licenses issued by the Commission
- Methodologies
  - The commission approves and regulates the implementation of methodologies developed by the licensees in respect of matters required or authorized by the Electricity Act and licenses issued by the Commission
- Guidelines
  - The Commission approves and regulates the implementation of guidelines developed by the licensees in respect of matters required or authorized by the Electricity Act and licenses issued by the Commission
- Manuals
  - The Regulatory Manual is a guide for stakeholders representing the code of practice that governs the functions of the Commission

Regulatory Instruments: Hierarchy

- Legislation
  - Public Utilities Commission of Sri Lanka Act, No. 35, 2002
  - Sri Lanka Electricity Act, No 20, 2009, as amended
- Regulations made by the Minister of Power & Energy
- Rules made by PUCSL
- Codes, Methodologies and Guidelines approved by the PUCSL
- Contracts between parties
  - Power Purchase Agreement (PPA) between Generation Licensees and the Transmission Licensee
  - Power Sales Agreement (PSA) between the Transmission Licensee and Distribution Licensees
  - Connection agreements between Distribution Licensees and Customers
- Internal Codes of the Transmission Licensee and Distribution Licensees

Regulatory Instruments – Economic Regulation

- Price (Tariff) Regulation
  - Cost reflective methodologies for tariffs and charges (July, 2011)
    - Transfer Pricing Mechanism
    - Bulk Supply Transaction Guidelines
  - Guidelines for preparation of regulatory accounts (May, 2016)
  - Tariff Review Procedure (August, 2016)
  - Regulations on Disadvantaged Group of Consumers (to be prepared)

Regulatory Instruments – Economic Regulation Contd.

- Service Quality Regulation
  - Electricity (Distribution) Performance Standards Regulation (July, 2016)
  - Electricity (Transmission) Performance Standards Regulation (July, 2016)
  - Guidelines on Benchmarking Distribution Licensees (October, 2013)
  - Electricity (Additional Information to be Provided to Distribution Licensees) Regulations (recommended to the Minister in March, 2014)
  - Supply Services Code (March, 2014)
  - Statement of Rights & Obligations of Consumers (December, 2014)
  - Methodology for Estimation of Energy Supplied (December, 2013)
  - Electricity (Consumer Consultative Committee) Regulations (December, 2009)
  - Electricity (Dispute Resolution Procedure) Rules (May, 2011; January, 2016)

Regulatory Instruments – Economic Regulation Contd.

- Market Regulation
  - Electricity (Applications for Licenses & Exemptions) Regulations (September, 2009)
  - Licenses to Generate, Transmit, Distribute and Supply Electricity as well as Exemptions to Generate and Distribute Electricity (September, 2009)
  - Electricity (Procurement of New Generation Plant & Extension of Existing Generation Plant) Rules (June, 2016)
  - Electricity (Power Purchase Agreement Transfer Price) Regulations (recommended to the Minister in November, 2016)
  - Electricity (Trading Arrangements) Regulations (recommended to Minister in November, 2016)
  - Electricity (Utility Driven Demand Side Management) Regulations (July, 2016)

Regulatory Instruments – Safety & Technical Regulation

- Safety Regulation
  - Electricity (Safety, Quality & Continuity) Regulations – recommended to Minister (July, 2016)
- Technical Regulation
  - Methodology for Merit Order Dispatch (April, 2011)
  - Least-cost Generation Expansion Planning Code (April, 2011)
  - Transmission Planning Code (April, 2011)
  - Distribution Planning Code (April, 2011)
  - Distribution Code (July, 2100)
  - Grid Code (March, 2014)
    - being reviewed
  - Electricity (Meter) Regulations (recommended to the Minister in December 2010)
  - Electricity (Electrical Inspectors' Functions, Duties and Procedures) Regulations (October, 2014)

Thank You

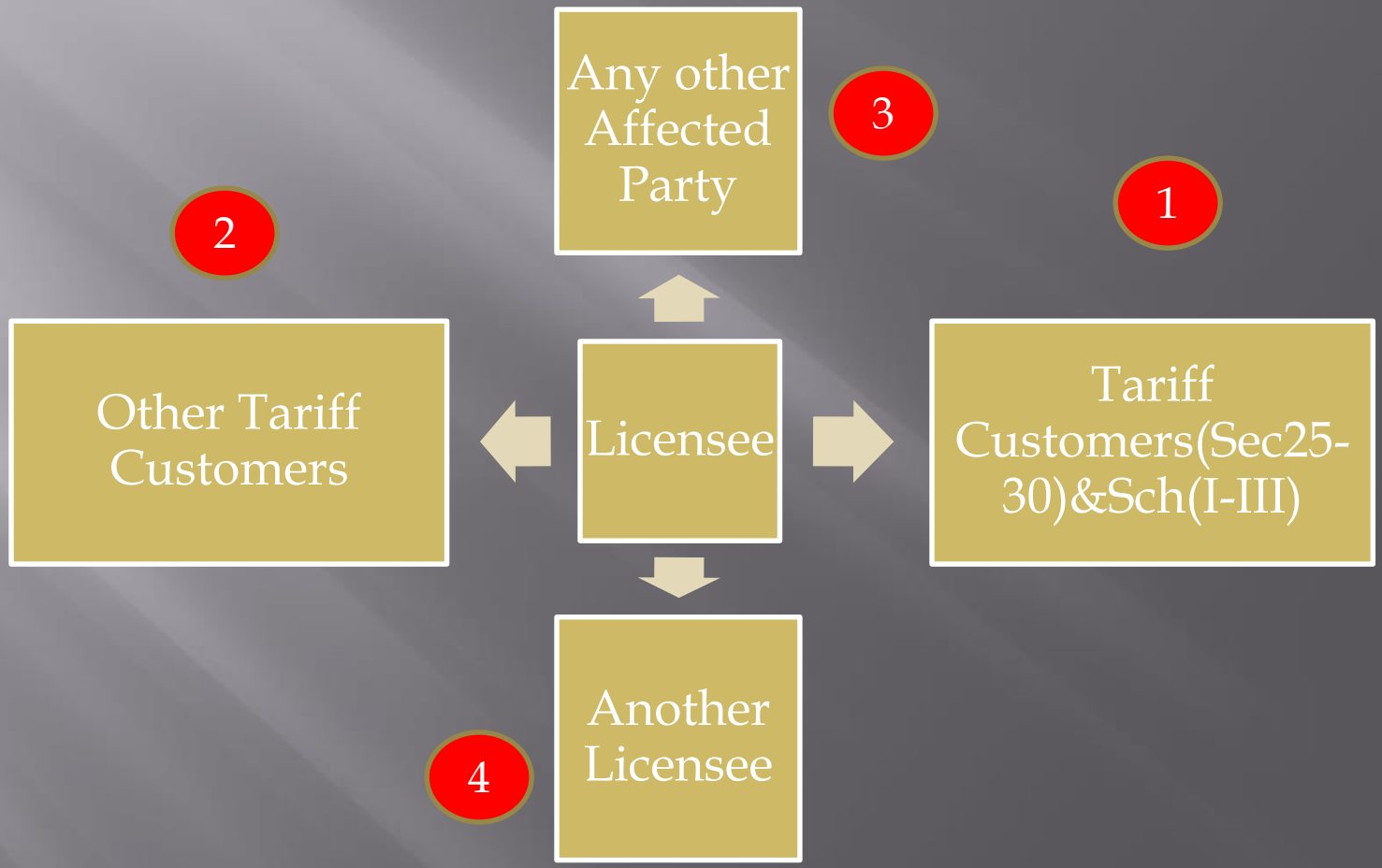
RESOLUTION OF COMPLAINTS AND DISPUTES BY PUCSL

Y. L. Farook, Director-Consumer Affairs

Complaint Handling Process

- Review complaints, collect information from relevant parties
- Identify Dissatisfied Cases: Inform parties not fulfilled their obligations to comply in accordance with the statement of Electricity Consumer Rights and Obligations
- Disagreed Cases: Inform parties to take action in accordance with Electricity(Dispute Resolution Procedure) Rules

Categories of disputes



Dispute Resolution Rules-Part I

- To resolve the Dispute by the parties
- Part-I, A - involves with 3 categories of disputes:
  - Category-1: Licensee & Tariff customer (Section 25-30 & Sch. (I-III)
  - Category-2: Licensee & Tariff customer (Other)
  - Category-3: Licensee & Other affected Party
- Part-I, B - involves with the category:
  - Category-4: Licensee & Another Licensee
- Disputed party under Part-I,A can make a written request to the Dispute Resolution Officer (Deputy General Manager of CEB-Distribution, Transmission or Generation Licensees or LECO-Head of Operation)to resolve the dispute
- A disputed Licensee (under Part-I, B) can send a written request to the other disputed Licensee with proposals for resolution and with details of 3 persons (one of them will be selected as an Evaluator by consent of both party)

Dispute Resolution Rules-Part I..Contd

- The disputed parties shall make every endeavor to reach a settlement with the assistance of the Dispute Resolution Officer/Evaluator
- If a settlement is reached, a "Memorandum of Agreement" will be issued by the Dispute Resolution Officer/Evaluator in the form specified
- If a settlement is not reached, a " certificate of non settlement" will be issued by the Dispute Resolution Officer/Evaluator in the form specified

Dispute Resolution Rules-Part II

- Either party failed to reach a settlement under Part-I may inform such failure in the form specified and call upon the Commission to resolve
- For Category-1, Commission shall appoint a Panel of Mediators and resolve
- For other 3 categories, Commission shall conduct a pre-mediation to decide whether it is more appropriate to be determined by the Court or at Arbitration
- If decided so, Commission shall inform the parties to take action accordingly or otherwise, appoint a Panel of Mediators and resolve

Panel of Mediators

- Consists of 3 persons
- Chairperson: A member of the Commission or a member of the staff of the Commission or a Public Officer
- Other 2 persons: Retired Public Officers, having experience and qualifications in the matters related to the dispute
- Commission appoint the required Panel of Mediators appropriate to the dispute

Panel of Mediators…Contd

- Shall notify the disputed parties in writing to be present at a mediation conference at the place and time decided
- Shall endeavor the parties to reach an amicable settlement
- Conclude the deliberation within the specified period
- If a settlement is reached, issue a Settlement Agreement in the form specified
- If a settlement is not reached, issue a certificate of Non-Settlement in the form specified

Cost of Mediation

- No cost will be recovered from disputed parties under Category-1, Commission will bare the cost
- No cost will be recovered from disputed parties under Category-2 and Category-3, if a settlement is reached at the first Mediation Conference, otherwise, will be recovered in equal proportion
- For Category-4, will be recovered in equal proportion

Public Utilities Commission of Sri Lanka
Level 06, BOC Merchant Tower
28, St. Michael's Road
Colombo 00300

t (011) 2392607/8
f (011) 2392641
e info@pucsl.gov.lk
w www.pucsl.gov.lk

THANK YOU

INS Division

Mr. Nilantha Sapumanage

16TH May 2018

Sri Lanka Electricity Act

Function of the Commission 3 (g):

- to **set** and **enforce technical and other standards relating** to the **safety**, quality, continuity and reliability of electricity supply services and metering services;

Objectives of the Commission 4 (a):

- **to protect the interests of consumers in relation** to the supply of electricity, by **promoting** efficiency, economy and **safety** by persons engaged in, or in commercial activities connected with, the generation, transmission, distribution, supply and use of electricity;

PUCSL ORF

What is ORF?

- Organizational Result Framework: Expected Outcomes and Outputs as a result of activities of the organization.

Key results areas

- Safety
- Power Quality (Supply quality and commercial quality for the users)
- Price (Tariff) and charges for the users
- Environment Pollution

- Encapsulating the Key Results area, PUCSL sets goals (12 numbers) to achieve ORF

PUCSL OUTCOMES

1. Improved productivity & convenience for electricity consumers
2. Affordable Price for consumers and sustainable financial stability for licensees
3. Improved safety of every living being and properties of general public, licensees & operators
4. Improved environmental conditions for humans, animals and plants

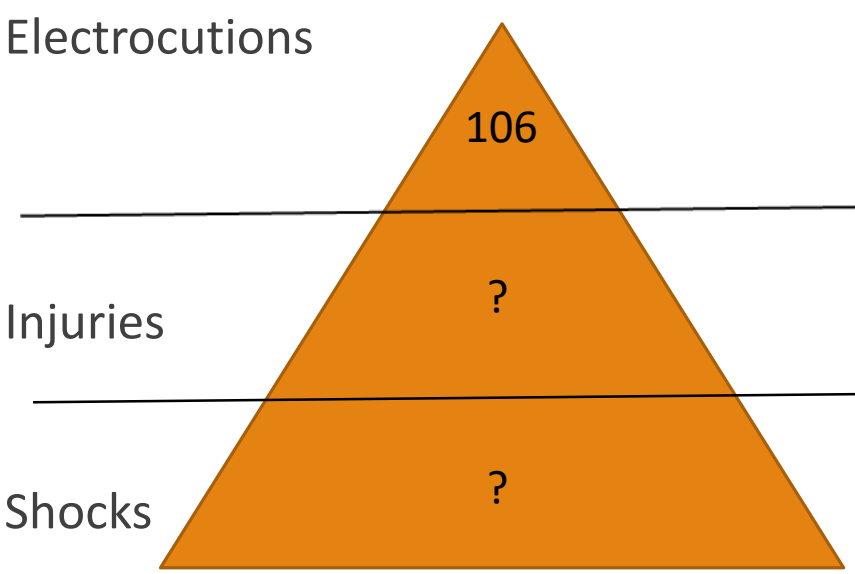
INSPECTORATE KRA's

- INS KRAs
  - Safety
- Outcome:
  - ✓Improved safety for lives and properties of General public, licensees and operators
- Output:
  - ✓Improved safety for lives and properties of General public, licensees and operators
  - ✓Increased knowledge and awareness on safe use and safe practices of electricity
  - ✓Increased access to safety related information

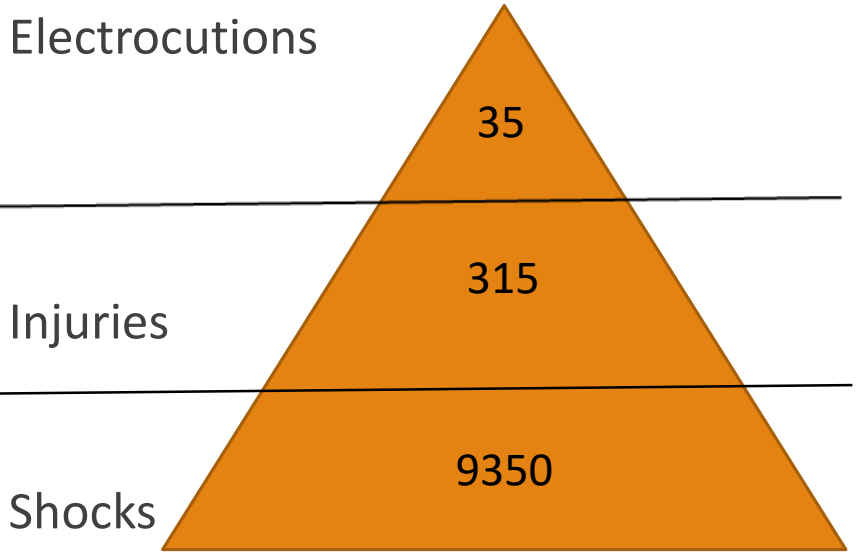
Why

Globally Accepted Bench Mark is 1:1,000,000 Population

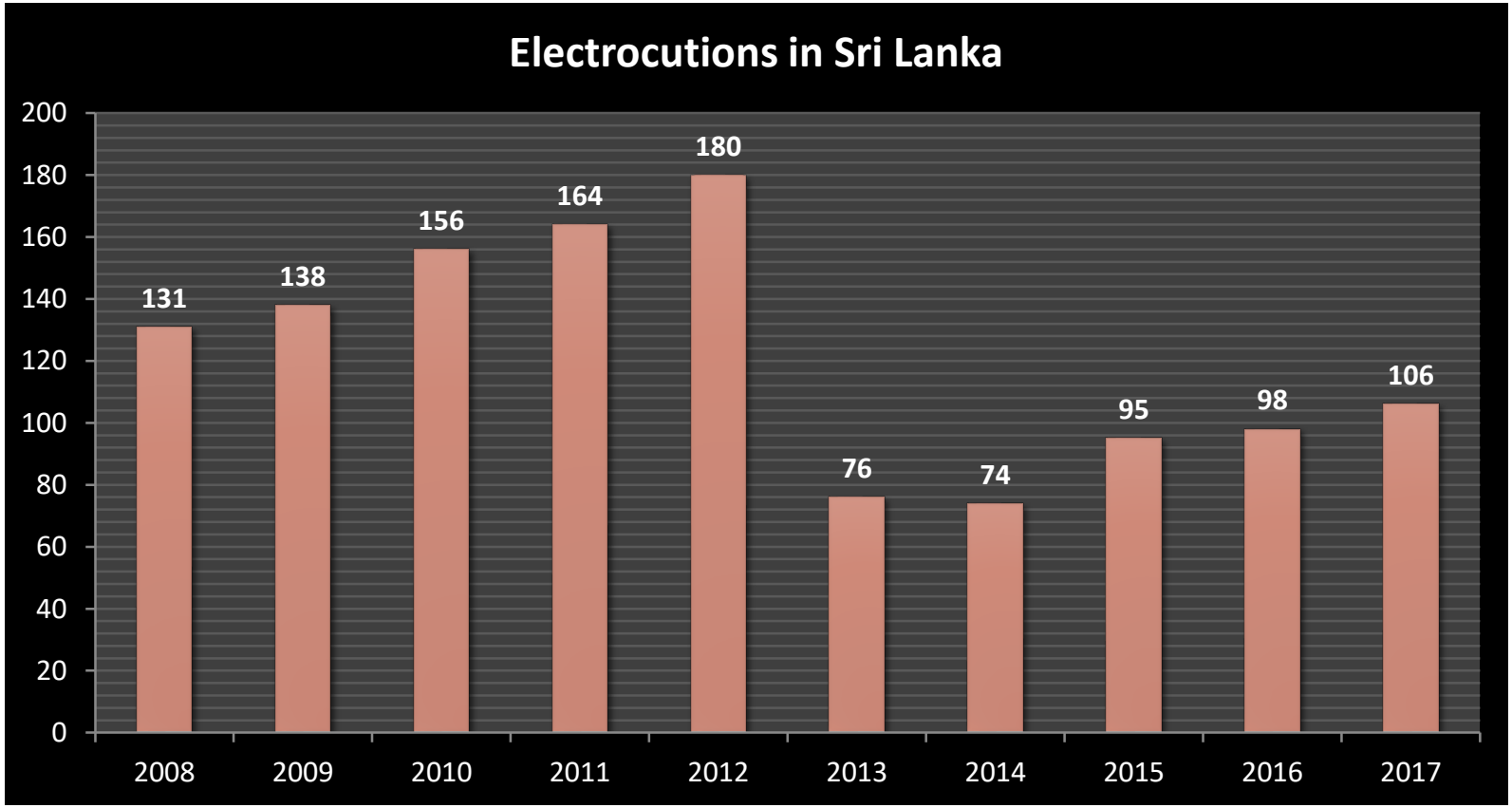
SRI LANKA



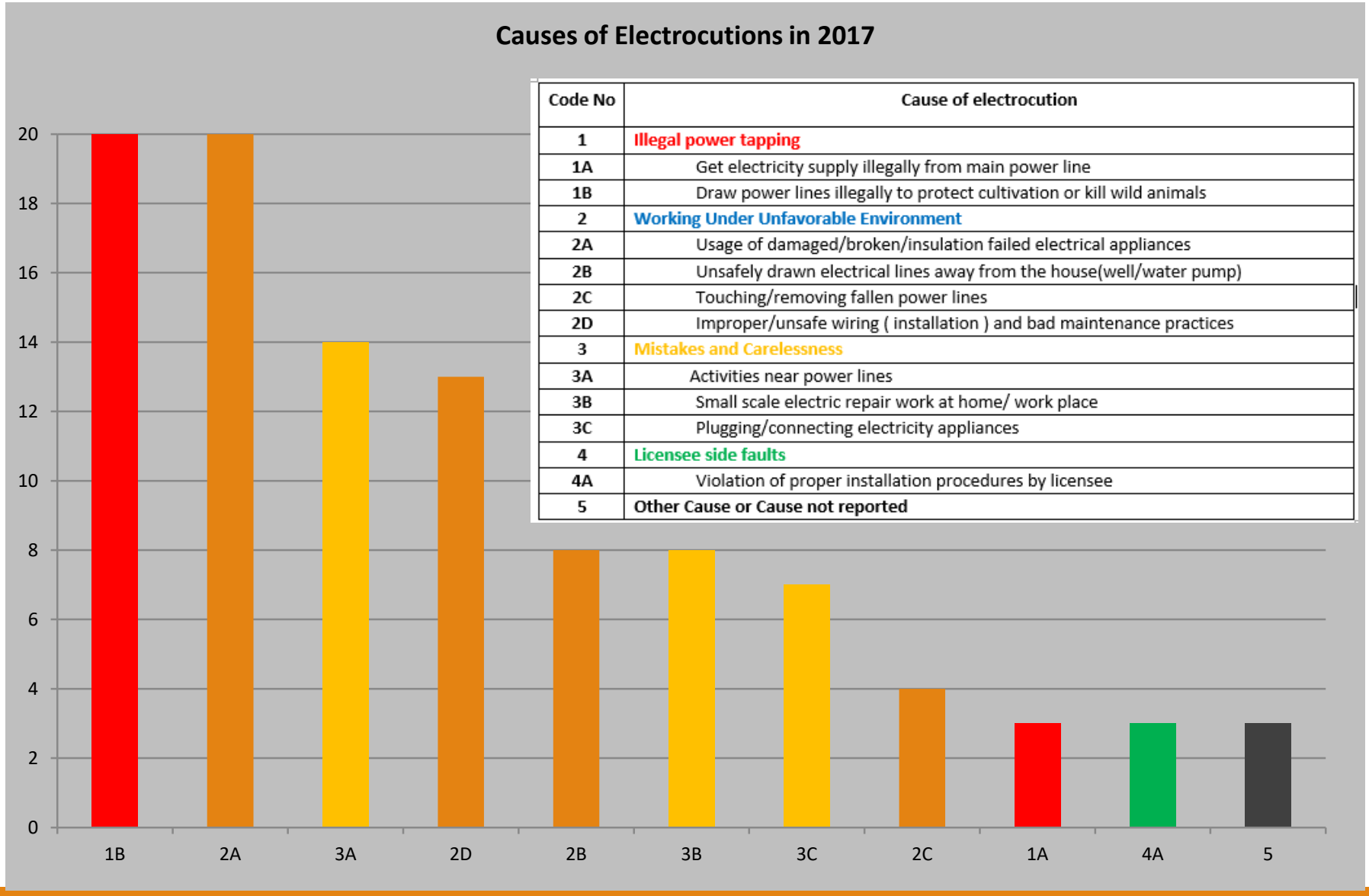
AUSTRALIA



Look back at the history…

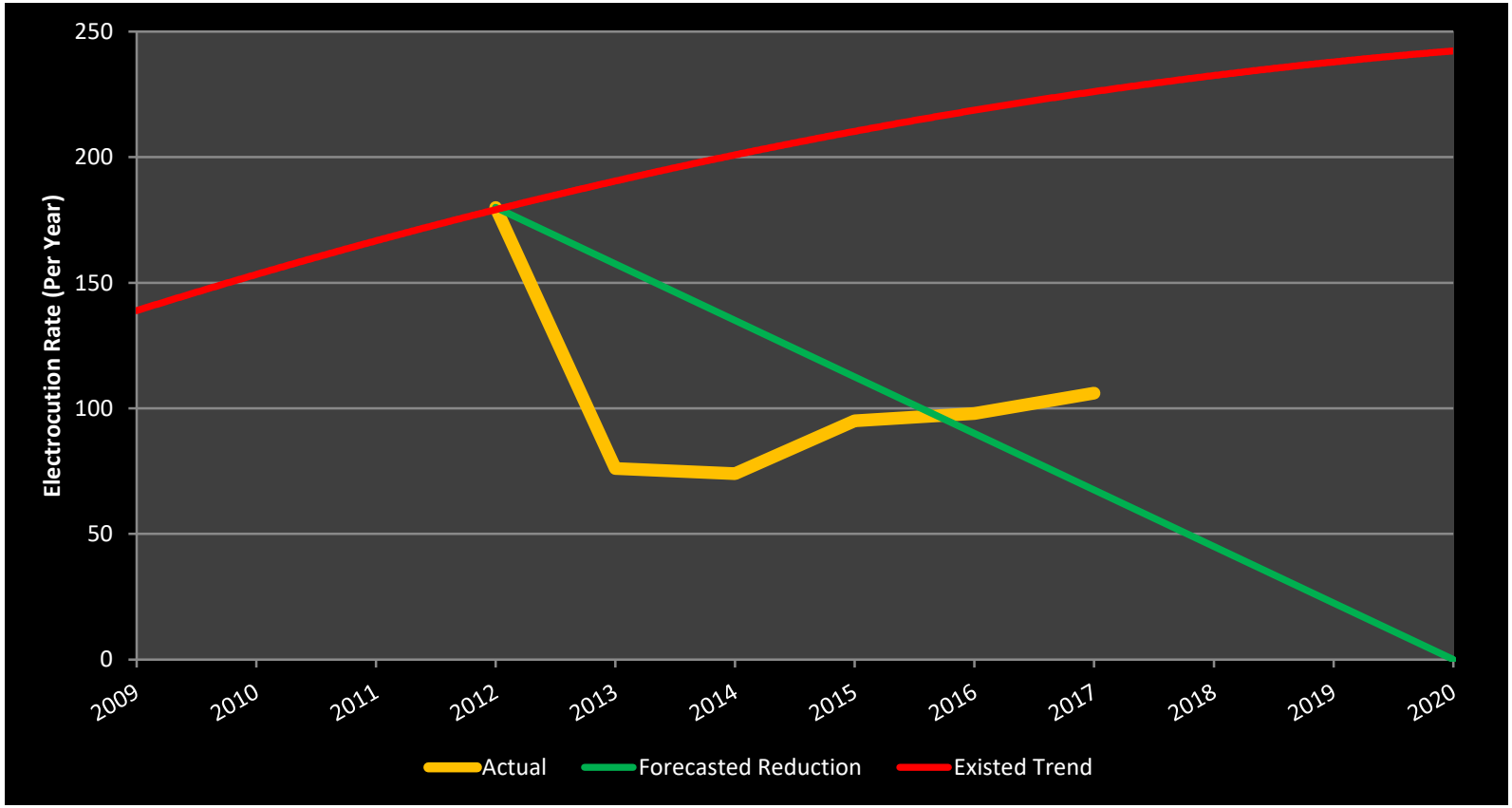


Causes of Electrocutions in 2017



Code No	Cause of electrocution
1	**Illegal power tapping**
1A	Get electricity supply illegally from main power line
1B	Draw power lines illegally to protect cultivation or kill wild animals
2	**Working Under Unfavorable Environment**
2A	Usage of damaged/broken/insulation failed electrical appliances
2B	Unsafely drawn electrical lines away from the house(well/water pump)
2C	Touching/removing fallen power lines
2D	Improper/unsafe wiring (installation) and bad maintenance practices
3	**Mistakes and Carelessness**
3A	Activities near power lines
3B	Small scale electric repair work at home/ work place
3C	Plugging/connecting electricity appliances
4	**Licensee side faults**
4A	Violation of proper installation procedures by licensee
5	**Other Cause or Cause not reported**

Where we want to be in 2020- < 20 number of electrocutions



Electricity Safety Objectives of PUCSL

- Safeguarding Lives and Properties

(GENERAL PUBLIC)

- Protecting Lives And Properties

(LICENSEE)

Activity Plan Deliverables

Activity Plan Deliverables (For General Public)

- Electrician Licensing
  - ✓Reduce the electricity related misfortunes taking place due to incompetency in Electrical Installations
- Establishing Village Level Voluntary Committees to avoid/ discourage illicit electricity tapping/ usage
  - ✓Forming a regiment to monitor and control unlawful power access
- Widespread Public Awareness (Audio, Video, Cartoon , Leaflets, Exhibitions, school guidelines and grade 6 and 10 syllabus)
  - ✓Mitigate accidents related to the Illegal power tapings

Activity Plan Deliverables
(For General Public)

- New Clearance Regulations (Section 54 of the Sri Lanka Electricity Act No 20, of 2009)
- Preparation of Policy Advice To The Government On Managing The Safety Clearances Of Transmission Line Corridors
  - ✓ Way Leave
  - ✓ Safety Signage
  - ✓ Clearance
  - ✓ Strategic Planning With Local Authorities
- Standardization of Electrical Appliances (PUCSL and SLSI)
  - ✓ Alleviating probable chance of meeting up with accident due to substandard products

Activity Plan Deliverables
(For General Public)

- Preparation of guideline for power failure investigations
  - ✓A Guideline which streamlines the process of Power Failure Investigations and provides initiative to minimize power failures in future.
- Development of regulatory measures for water fittings
  - ✓Increasing the efficiency of water-resources usage through advancement in Quality
- Establishment of Plumber Licensing
  - ✓Assuring the importance of possessing license to diminish incompetency in the profession to increase the efficiency

Activity Plan Deliverables
(For Licensee)

- Safety and Technical Management Plan
- Safety Indices
- Incident Reporting System (IRS)
- Safety Audits

Routine Activities

Routine Activities

- Sanctions
  - ✓Giving verdict for the violations which were referred by the utilities.
- Site Inspections
  - ✓ Visiting the places which had been identified with electricity installation violations and remedying.
- Monitoring and Controlling the electrocutions
  - ✓With the help f police having an eye on the electrocutions and planning mitigation measures
  - Heat Rate Test

Thank You

Tariff Filing and Analysis Procedures

Kanchana Siriwardena

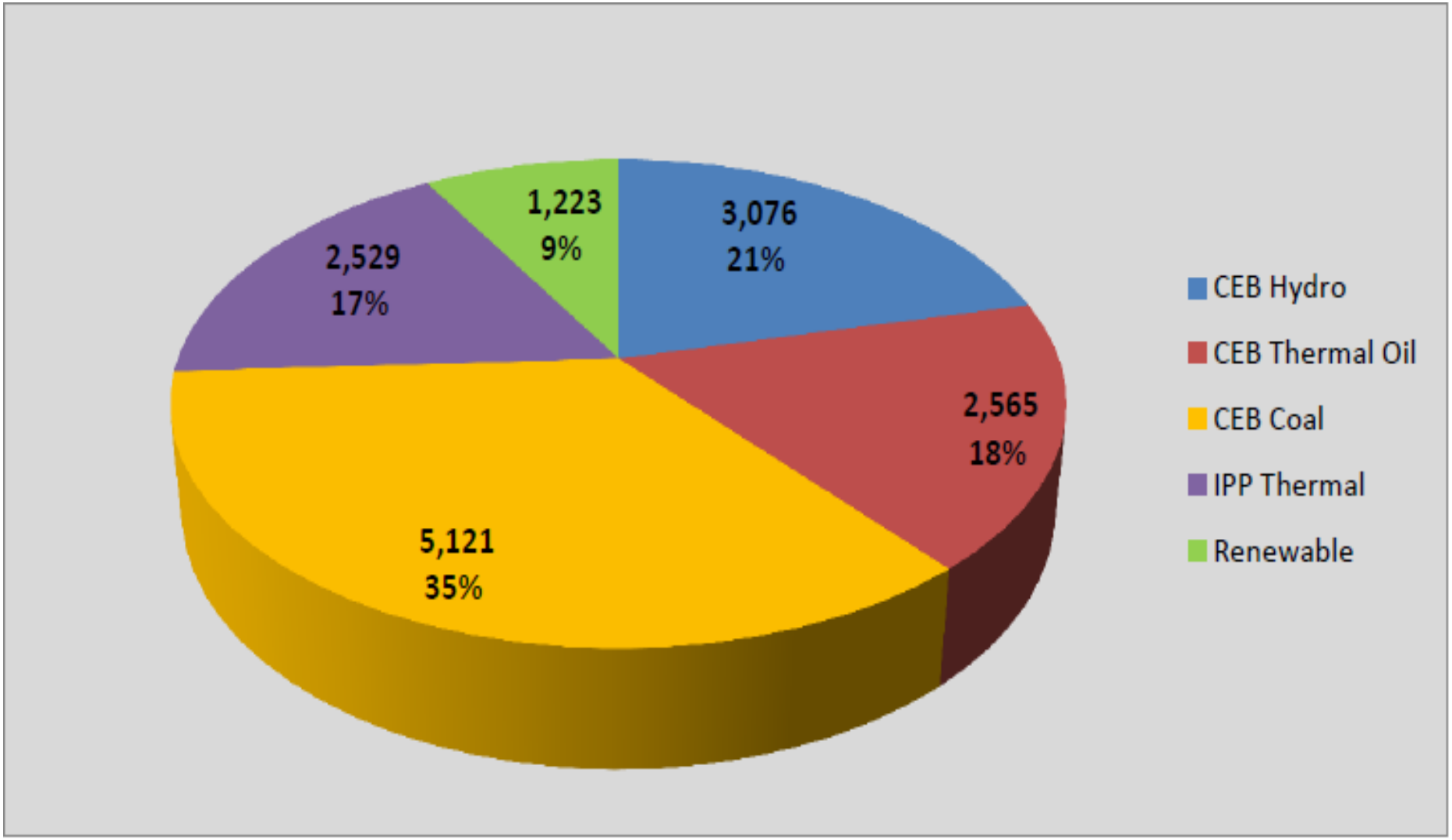
Public Utilities Commission of Sri Lanka

11th October 2017

Sri Lanka Power Sector statistics

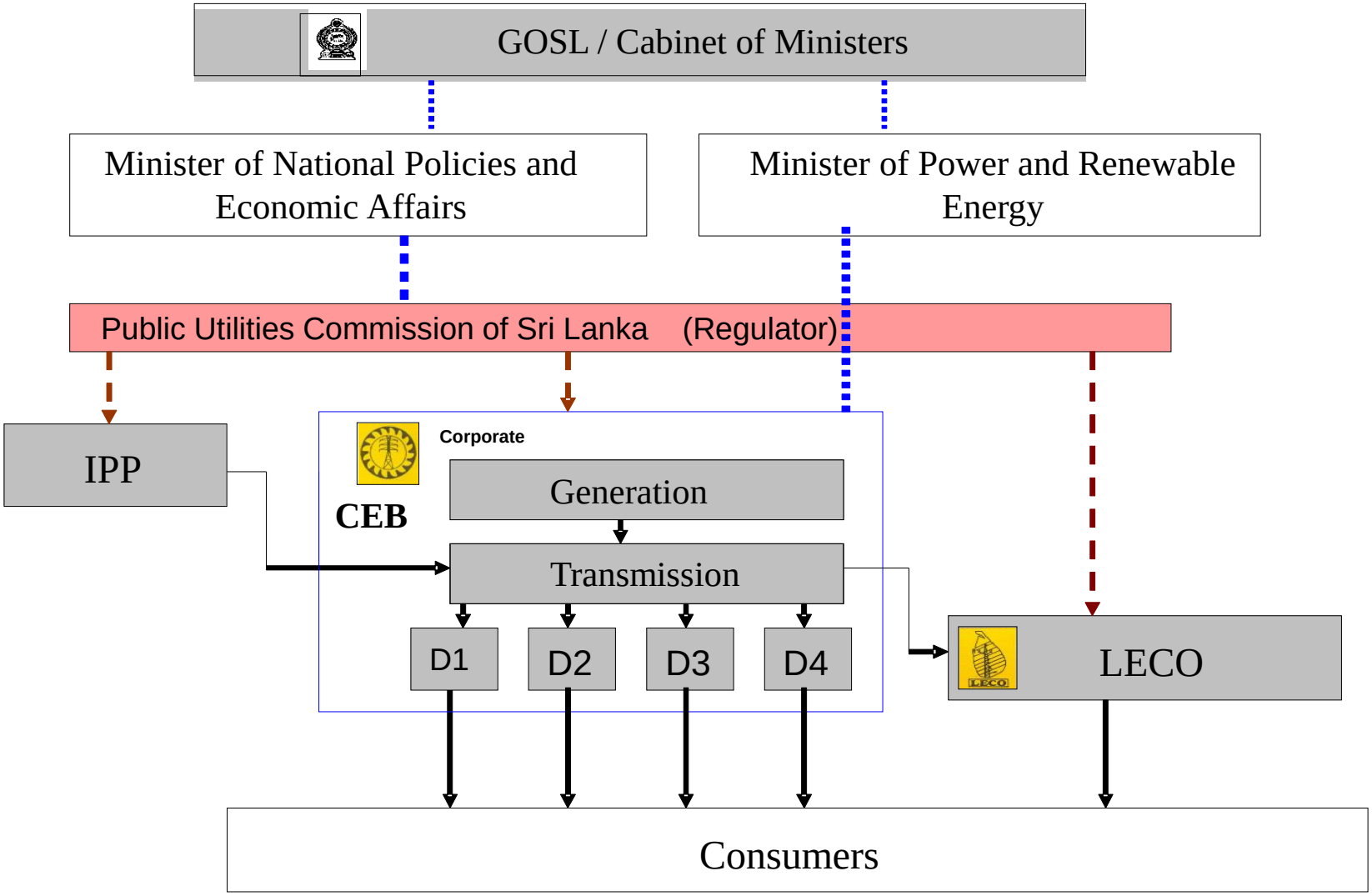
- Generation Capacity (3,950 MW)
  - Large Hydro 1,377 MW
  - CEB Thermal 1,504 MW
  - IPP Thermal 511 MW
  - NCRE 557 MW (354 MW mini-hydro, 129 MW Wind, Solar 51MW, other 24 MW)
- Peak Demand – 2,400 MW
- Sales – 13,500 GWh
- Consumers – 6.4 Million

Energy Resources 2017

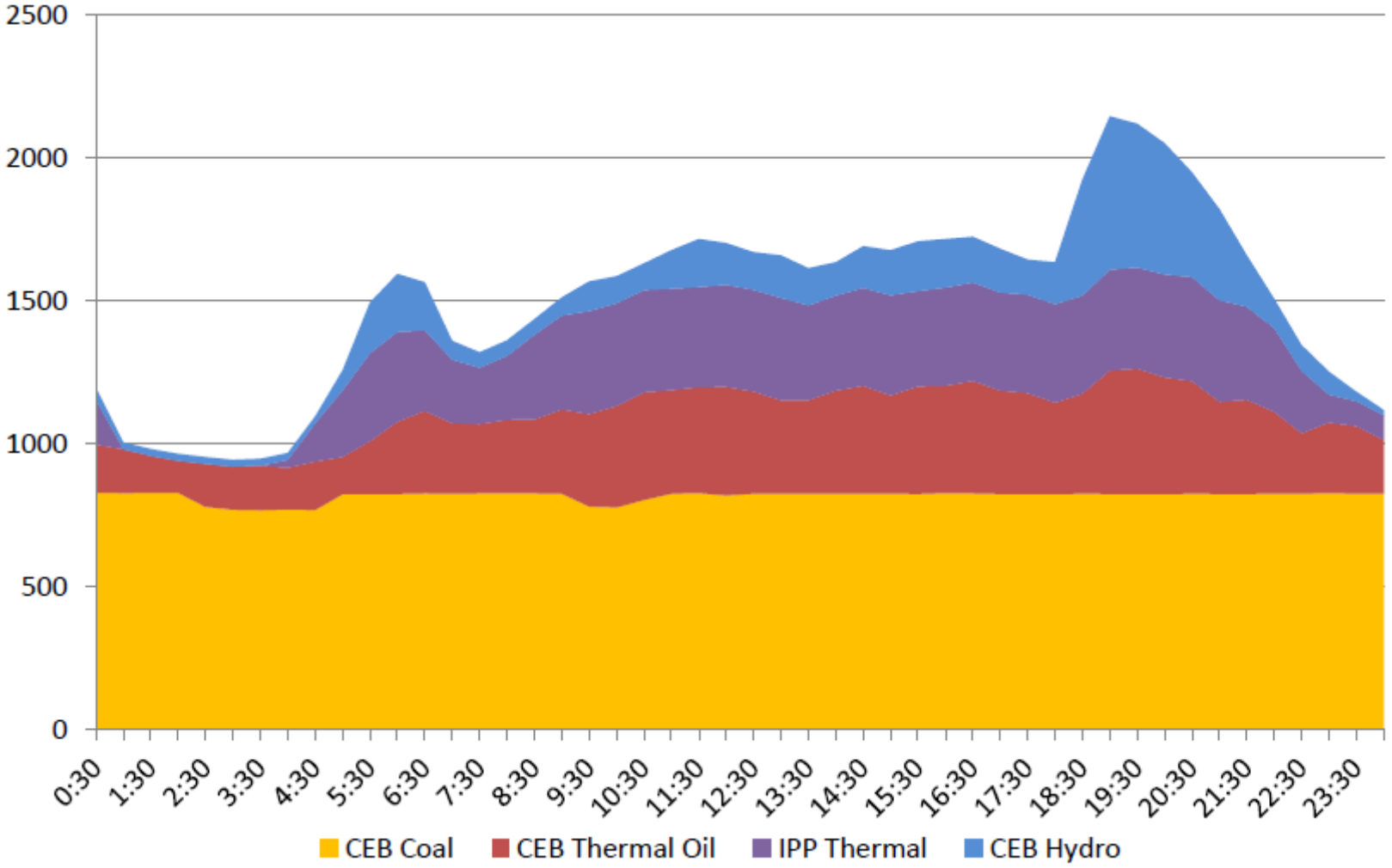


Industry Structure

- Structure



Load Curve


2500
2000
1500
1000
500
0
0:30
1:30
2:30
3:30
4:30
5:30
6:30
7:30
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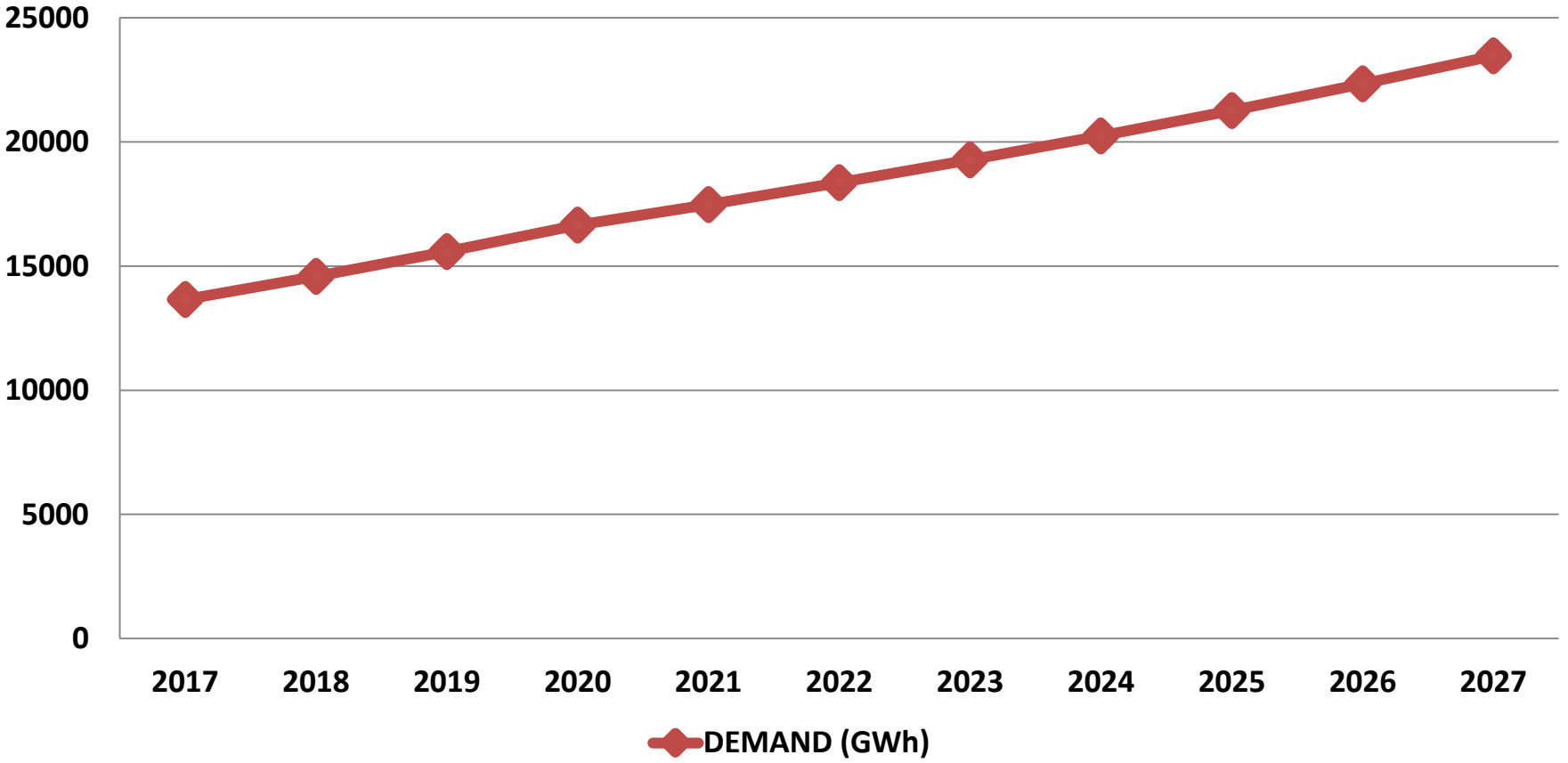
9:30
10:30
11:30
12:30
13:30
14:30
15:30
16:30
17:30
18:30
19:30
20:30
21:30
22:30
23:30
CEB Coal
CEB Thermal Oil
IPP Thermal
CEB Hydro

Projected Demand Growth



Highlight of achievements

- Electrification – Almost 100%
- Availability – 24/7
- Losses – 14.5% in 2009 to 8.96% in 2016

Current Priorities

- Generation and Transmission Investment
  - Absorbing intermittent RE sources
  - Coal v Natural Gas
  - Ownership
- System reliability
  - Few blackouts in 2016
- Power and Supply Quality
- Tariff
  - Subsidies and cross subsidies

Legal Background

- Sri Lanka Electricity Act, No. 20 of 2009
  - Recovery of reasonable costs of the Licensee
  - Tariff methodology
  - Subject to General Policy Guidelines of the Government
  - Subsidies and funds for subsidies
  - Cross-subsidies

Tariff Methodology

- Multi Year Tariff Methodology
  - Review costs over 5 year tariff period
  - Transmission and Distribution - variable revenue caps
  - Retail – variable price cap
  - Generation costs reviewed every 6 months
  - Possible consumer tariff revision every six months
  - Uniform National Tariff
  - Ex-post adjustments

Transmission and Distribution Costs

- Forecast Demand
- Approved Investment Plans
- Forecast Operation costs
- Asset Base
- Depreciation forecast
- Return on Assets
- Network Loss targets

Licensees can make profits through cost cutting and efficiency improvement

Generation Costs

- As per the terms of Power Purchase Agreements
- Dispatch forecast based on Guidelines/ software
- Reviewed every six months due to sizable variations possible
- Cost pass through

Costs to Consumer Tariffs

- Allowed costs are decided by PUCSL
- Licensees are requested to come up with proposed tariff structure
- Government Policy Guidelines and other demand side management objectives taken into account
- Consumers/ stakeholders are consulted
- Cost of supply calculations
- Tariff published as approved by PUCSL

Bulk Supply Transaction Account

- As per PUCSL guidelines
- Records bulk electricity purchase and sales of Transmission Licensee
- Place where subsidy can be injected
- Only Licensee account closely monitored by PUCSL

Structural Changes in Tariff

- Mandatory Time Of Use Tariffs for all Bulk consumers
- Optional TOU tariffs for Domestic Category

- Introduced categories to target subsidies
  - Agriculture sector included in Industry Category
  - Government schools, hospitals, etc
  - Domestic below 60 grouping

Latest Domestic Tariff

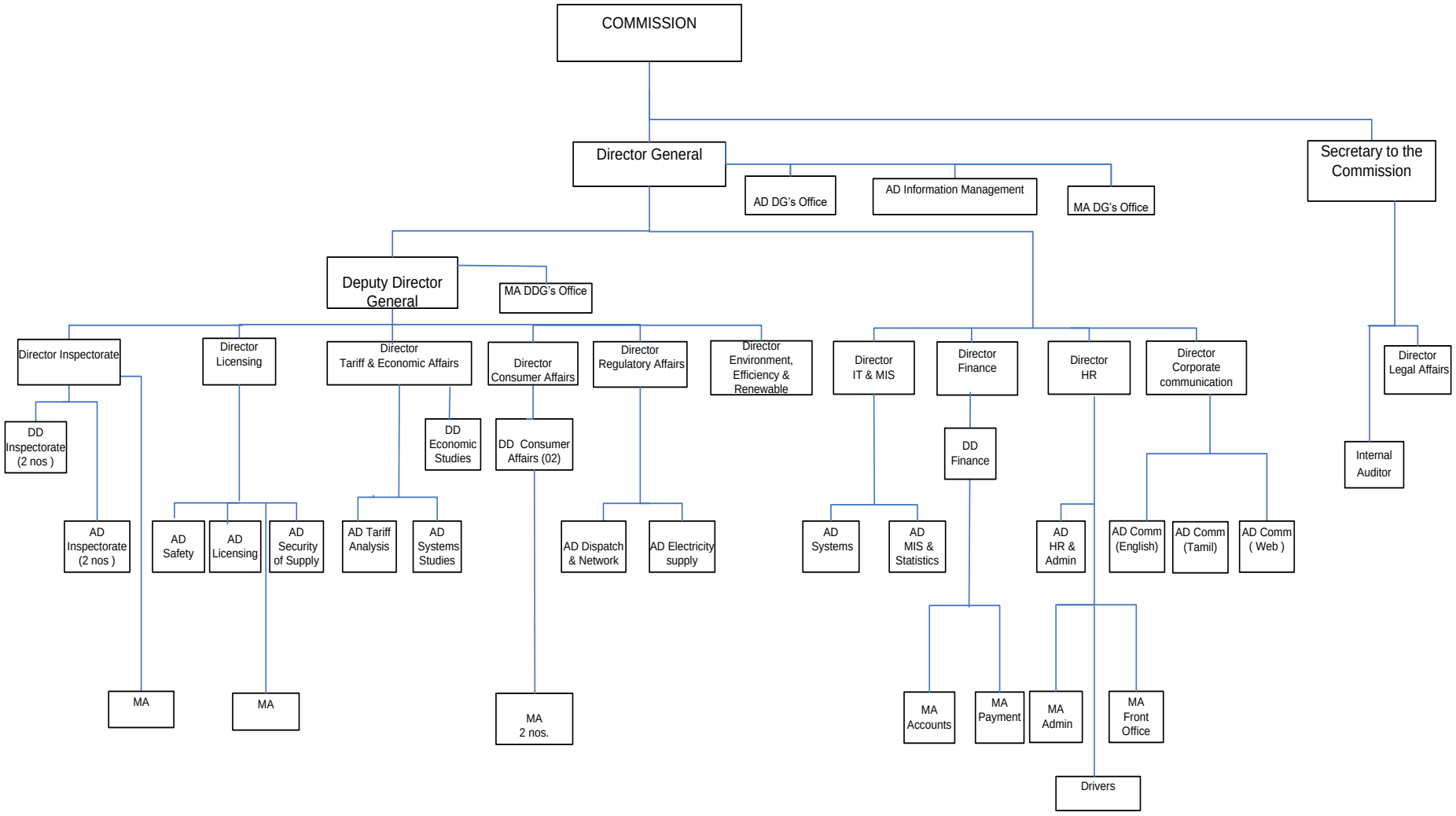
Consumption (kWh/ month)	Rs./kWh	Rs./month
0-30	2.50	30
31-60	4.85	60
0-60	7.85	-
61-90	10.00	90
91-120	27.75	480
121-180	32.00	480
>180	45.00	540

Upcoming Reforms

- Standardized Regulatory Accounts and Financial Separation
- Generation Dispatch Audit
- Interest payment for Security Deposits
- Performance Standards and Penalties
- Tariff methodology review in 2018

Thank You

Organization Structure



Organizational Results Framework (ORF), Key Performance Indicators (KPI) and Impact