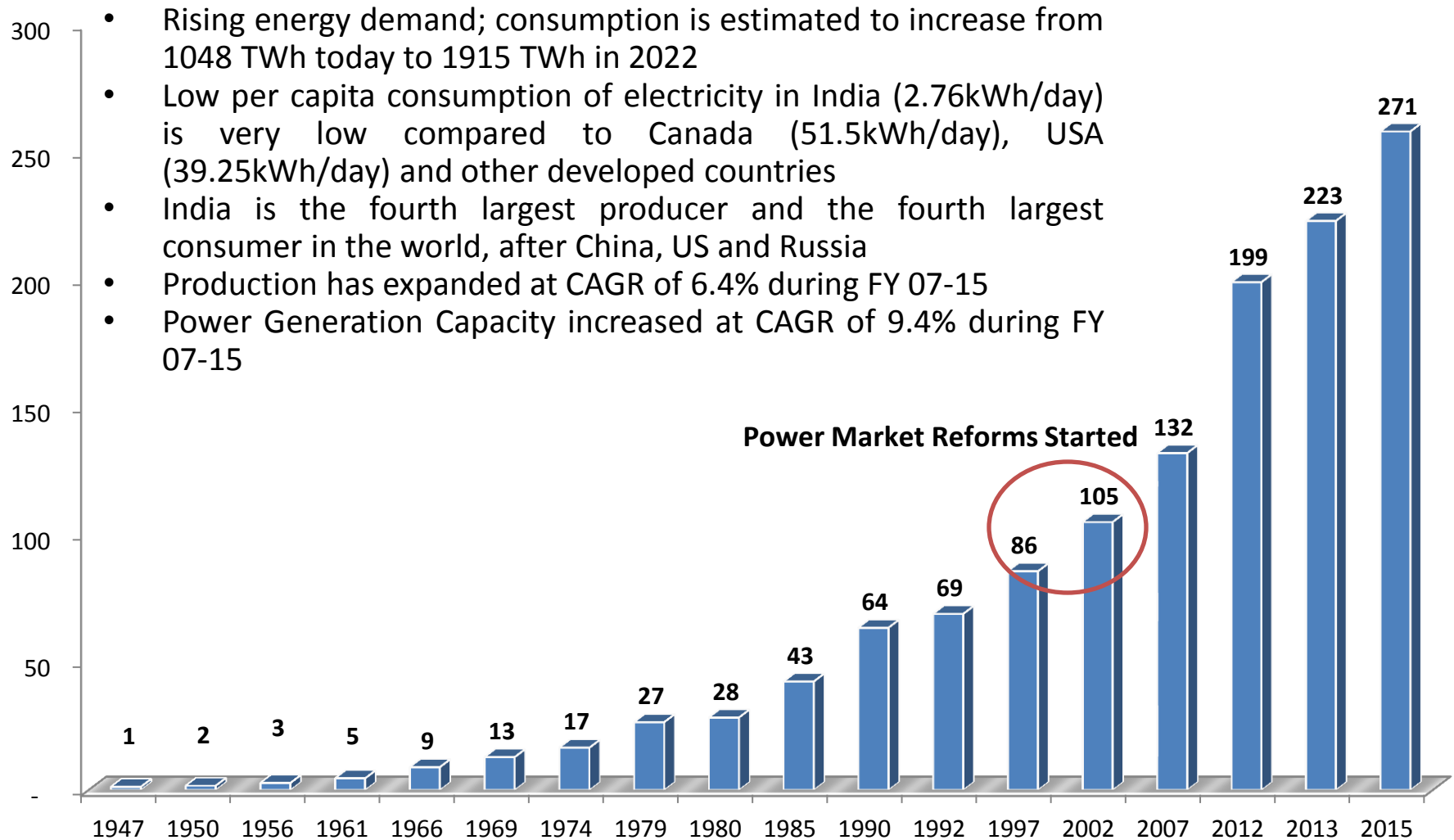




## **Power Trading Solutions for India**



# Power Sector - Scenario



**Generation Capacity Growth Story 1947-2015**  
(Figures in GW)

# Prior to Power Market

- Monopoly Suppliers (SEBs, Private Licensees); Each SEB had an allocated share in a Central/ Jointly owned station
- Generators (CGSs, IPPs and SEBs) with capacity fully tied up
- Price setting by Central/ State Governments – SEBs hardly having any say
- Entire sector developed on fixed rate return; Interplay of market forces remained non-existent
- Utilities would back-down in case of low demand and resort to load shedding in case of excess demand
- Power as a resource for earning revenue did not exist in this cost based regime
- Power supply between the States/vertically integrated utilities were characterized by small , intermittent volumes
  - ❖ Mostly in the nature of emergency support
  - ❖ No commercial arrangements
  - ❖ Non-payment or payment delays with resultant disputes
  - ❖ Lack of transmission inter-connections created restrictions
  - ❖ Sustained shortages, both in energy and peak demand

# Need for Power Market

- **Need for investments**

- ❖ Power being a capital intensive industry, Govt was not able to cater to the funding requirements for growing demands of power and capacity addition and hence needed private investments in generation and also in the related infrastructure
- ❖ Concept of market was needed to ensure transparency, optimization and attracting investments into the sector

- **Need for efficiency**

- ❖ Geographical Diversity - Concentration of demand and supply in different pockets of India
- ❖ There was a need for optimum utilization of the existing capacity

- **Need for Trading Solutions**

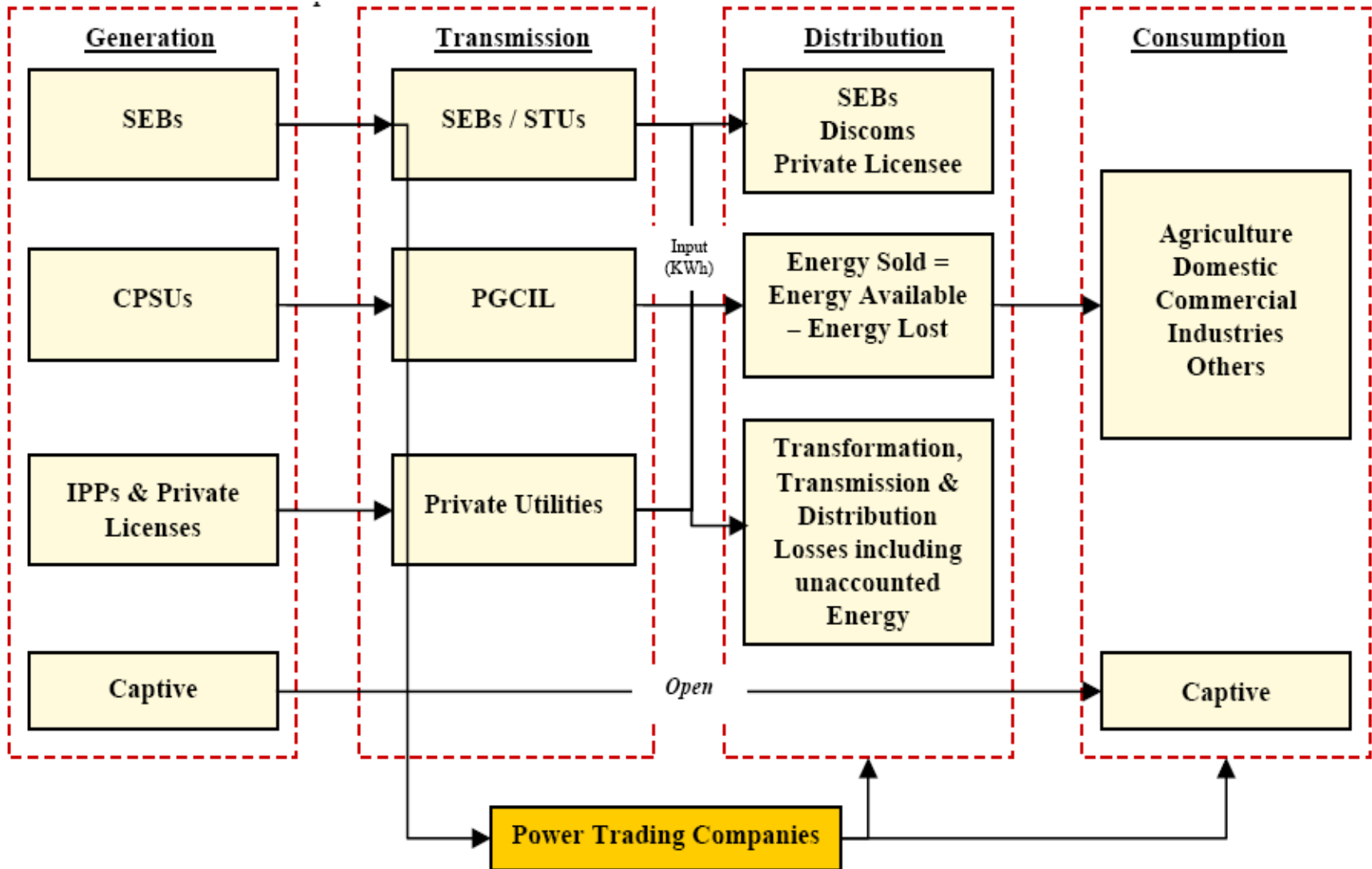
- ❖ Generators needed to focus on their generating business
- ❖ Generators were apprehensive about the payments from SEBs/Discoms and market for power for merchant capacity
- ❖ Financial Institutions were looking for comfort in the form of one point sale of power and stronger payment security mechanisms
- ❖ Trading solutions and traders were needed to take care of the market for the power produced by generators, open access requirements and the collection from the SEBs/Discoms

# Introduction of Power Market in India



- PTC was formed by Gol with mandate for
  - ❖ promoting power trading to optimally utilize existing resources
  - ❖ attract viable investments in the power sector on the strength of multi-buyer model
  - ❖ creating a Power Market in India and the neighboring countries
- Electricity Act 2003 defined Trading as a distinct activity requiring license
- Concept of Open Access was also introduced with the Act
- With introduction of power trading, power is now perceived as a commodity
- In case of plant outages, States have an option to procure power from alternate sources
- Trading solutions created framework for new capacity addition with bankable PPAs
- As on today share of IPPs have significant share (~38%) in the installed capacity

# Industry Structure



# Role of Power Trading Solutions

## Instruments

Development of Power market and introduction of innovative products for customers

Transition from cost-based returns to market based returns

Creating “value” for power – market based price discovery of power

Optimal utilization of generation capacity

## Process & Execution

## Mechanism

Established the viability of concept

- Power market can play key role in growth of sector
- Credible intermediary
  - Payment Security Mechanism
  - Weekly billing to reduce credit risks
  - Right to divert in case of default
  - Relationship of trust, transparency
- Comfort to developer of power projects –by addressing market risks
- Comfort to lender – by addressing credit risks
- A catalyst for private investment in the sector

# Role of Traders - Seller's & Buyer's perspective



## Seller's perspective

- Arrange off-take of power as made available by the seller
- Identify buyer for off-take of contracted capacity and enter into requisite commercial agreement on back to back basis
- Manage entire transaction such as Open Access, scheduling, Energy accounting & other system compliance/approvals
- Co-ordinate with relevant agencies for transfer of power
- Facilitate sale of power to third party from alternate sources in case of short off-take by original buyer
- Ensure payment security
- Facilitate energy settlement
- Ensure power for testing & commissioning of Power station/Transmission lines

## Buyer's perspective

- Arrange power as per requirement of procurer
- Identify Seller for supply of contracted capacity and enter into requisite commercial agreement on back to back basis
- Manage entire transaction such as Open Access, scheduling, Energy accounting & other system compliance/approvals
- Co-ordinate with relevant agencies for transfer of power
- Facilitate supply of power from alternate sources in case of generator outages
- Ensure supply comfort (Contract performance)
- Facilitate energy settlement
- Supply of power to Industries/large consumers



# Power Trading Solutions



Nature of Contract	Duration of Contract	Transmission Open access availability
Long Term	Upto 25 years (35 years for Hydro)- Tie up under negotiation still allowed for Hydro Projects	Long term open access is available for a period of 12 years to 25 years
Medium Term	> 1 years and up to 7 years	Medium term open access is available for a period of 3 months to 3 years
Short Term –Bilateral	Up to 1 year	For a period of up to 3 months
Short Term –Power Exchange	Day Ahead Market (1 day)	1day (corridor left after short term bilateral)
	Term Ahead Market (up to 7 days)	Up to 7 days in advance
Deviation Settlement Mechanism	Real time balancing mechanism for settling deviation from schedule	

# Suitability of various Contracts

## ▪ Long Term Contracts:

### Features:

- ❖ Coming from traditional system. Visibility in certainty of cash-flows
- ❖ Discoms require the power assurance for long duration
- ❖ Associated infrastructure such as Coal mining, Transmission are also created for long term 20-25 years

### Challenges:

- ❖ There is a need to revisit the suitability of long term PPAs in the context of changing dynamics
- ❖ Difficulty for Discoms in terms of projected revenue realizations
- ❖ Increase in input cost of generation viz-a-viz projections and revenue realizations

## ▪ Short Term Contracts

### Features:

- ❖ Handle seasonal and temporary demands
- ❖ Market for merchant capacity
- ❖ Cater to unfulfilled demand by Discoms
- ❖ Day ahead requirements being fulfilled by power exchanges

### Challenges:

- ❖ Constraints in terms of availability of open access (Transmission capacity restrictions, NOC issues from Discoms)
- ❖ Unpredictable price and supply / demand of power which may lead to disruption of industrial/production planning and other cascading impacts

# Suitability of various Contracts

## ▪ Medium Term Contracts

### Features:

- ❖ Vary from 1-7 years with an optimum period of 5 years
- ❖ Govt has allowed the Competitive Bidding for Medium Term
- ❖ Provides flexibility in terms of changing demand projections from Discoms' perspective
- ❖ Flexibility to generators to revisit the tariffs based on revised costs on intervals
- ❖ Innovative financing (5X25 scheme) available to cater to needs of such contracts

### Challenges:

- ❖ Systemic challenges (Coal availability and transportation, Transmission and financing)
- ❖ Impact on consumers due to interplay of market forces. This can be mitigated to an extent by proper contract mix

# Development of Regional Power Market



## India and Bhutan

- Presently, inter-country cooperation mainly on bilateral basis
- Currently India imports about 1400 MW from Bhutan (3 operational projects) for which Indian Govt. has identified PTC India Ltd as nodal agency
- Another 10000 MW likely to be added by 2026

## India and Nepal

- PTC facilitates power sourcing for Nepal in winters on commercial terms
- Power Exchange between Nepal & Bihar as per the formula of Indo-Nepal Power Exchange Committee
- Several transmission interconnections exists between India & Nepal on Radial Mode
- 400 kV Muzaffarpur - Dhalkebar line once implemented will have carrying capacity of 1000 MW
- Presently, inter-country cooperation mainly on bilateral basis

## India and Bangladesh

- 500 MW power is being supplied from India via 400 kV HVDC Behrampur-Bheramara line

## SAARC Grid

- ❖ SAARC Countries have signed framework agreement for co-operation in power sector to ensure electricity trading through grid connectivity in the region
- ❖ Hydro rich countries such as Nepal and Bhutan can develop Hydro potential and supply power to other SAARC countries and can also buy power during dry seasons

## Aggregation/Disaggregation

- ❖ CERC has come up with a Discussion paper wherein there may be innovative trading solutions involving multiple buyers/sellers in a transaction

## Separation of Carriage and Content

- ❖ Proposed Amendments to the Electricity Act 2003 provide for separation of carriage and content with an aim to introduce competition in the distribution sector
- ❖ Power market expected to expand with more opportunities in the supply business and improvement in services to the consumers

## Trading Solutions for Renewable Energy

- ❖ Intermittent nature of RE sources creates challenges in introducing trading solutions leading to over - dependence on the State Discoms.
- ❖ More accurate forecasting techniques are expected to resolve this issue and bring in customized trading products for RE segment

# Thank You

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