



Impact of tariff on System Operation



PRESENTATION OUTLINE

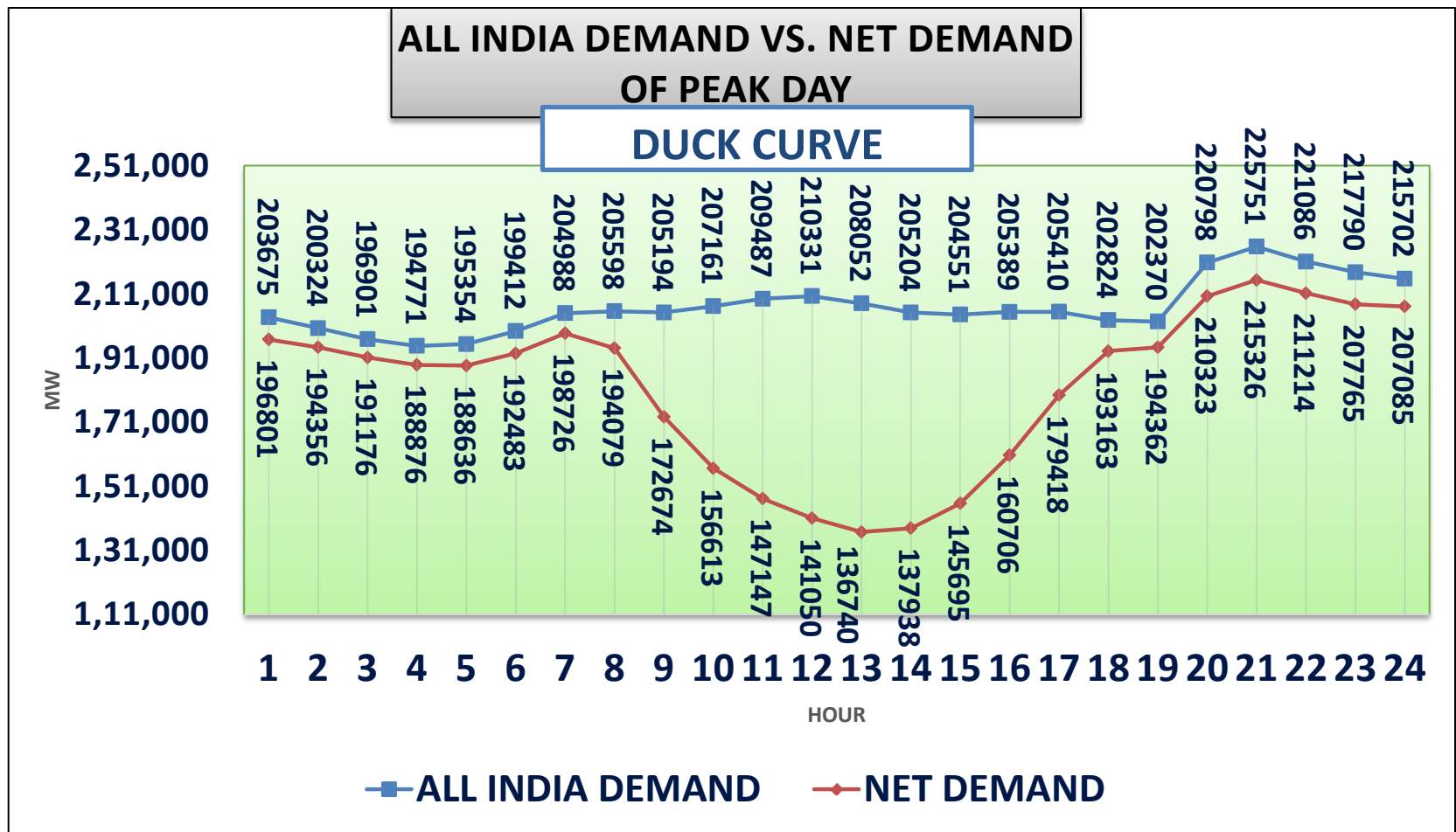
- Future outline
 - Transformation in Power Industry
 - All India Demand & Net Curve
 - Generation Mix
- Transition in 2019-2024 tariff period
- Policy Implication
- CERC approach paper
- COD related issues
- Storage and its importance

TRENDS TRANSFORMING THE POWER INDUSTRY

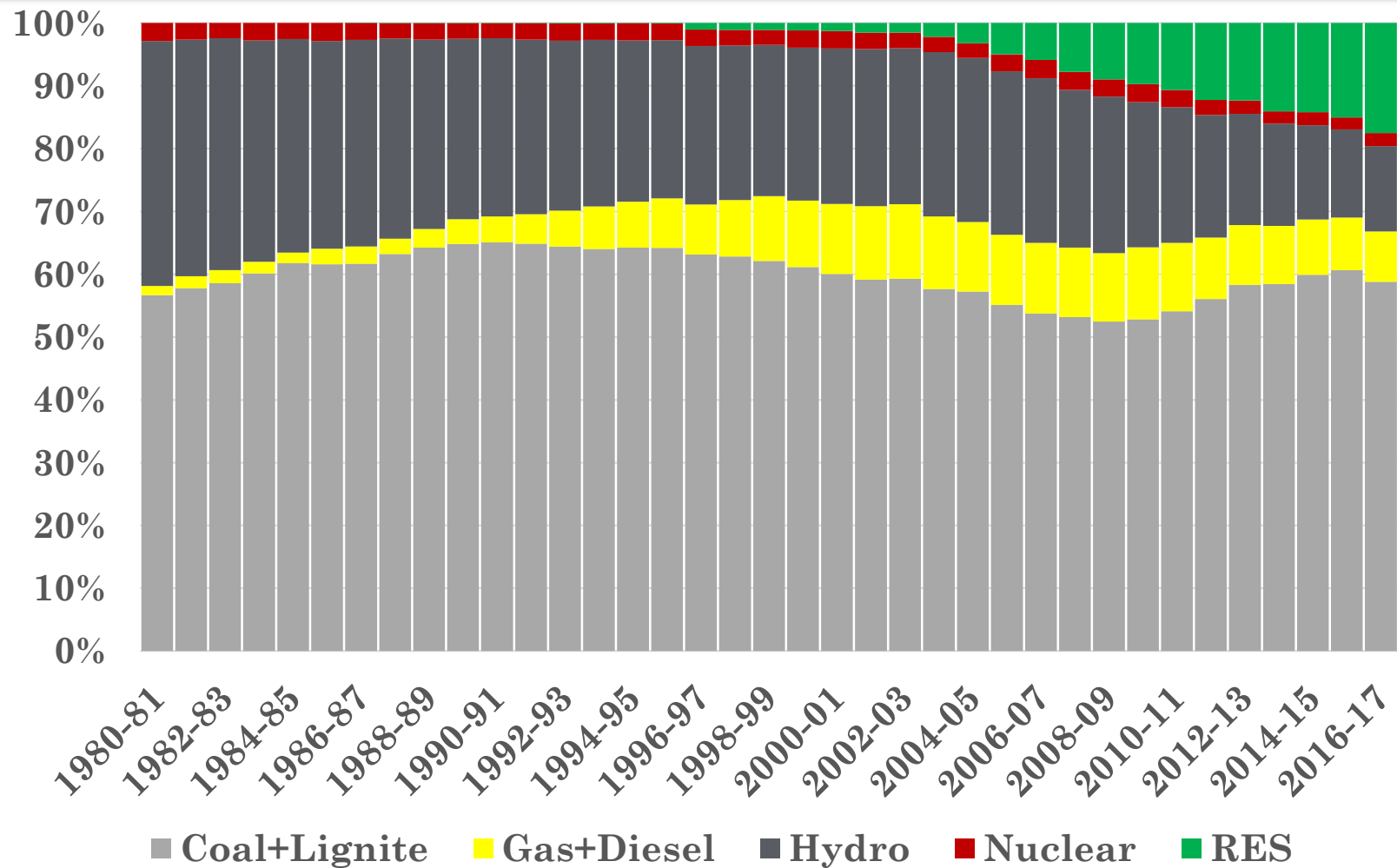


Characteristic	Old	New
Load Growth	High	Slow
Control	Centralized	Decentralized
Generation	Despatchable	Intermittent
Fuel	Fossil	Renewables
Customers	Consumers	Prosumers
Tariffs	Volumetric	Transactive
Demand	Inflexible	Price-responsive

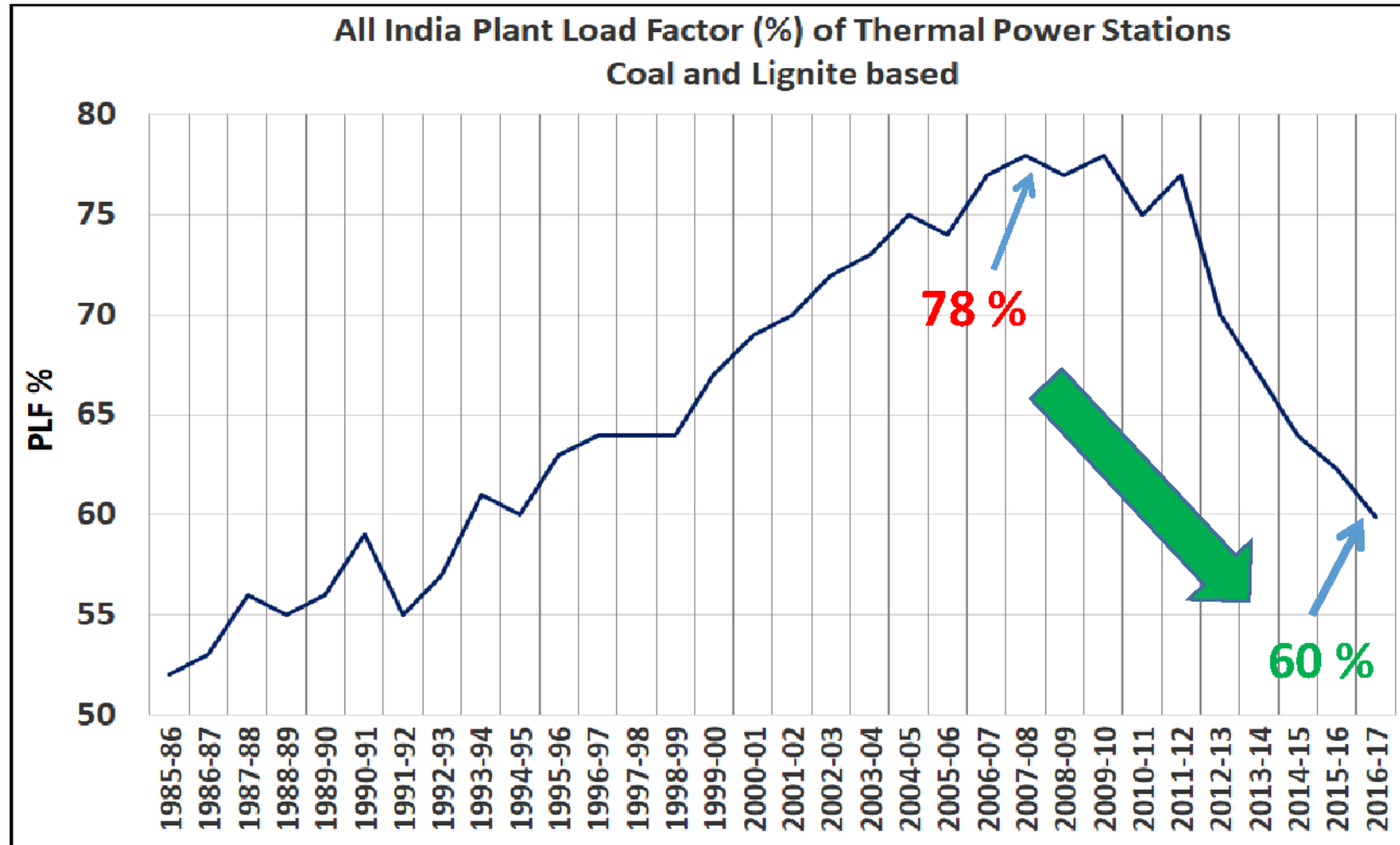
TYPICAL ALL INDIA DEMAND & NET LOAD CURVE (2021-22)



CAPACITY MIX (SINCE MARCH,1981)



Declining PLF of Thermal Power Stations



Transformation in 2019-2024 tariff period



- Target of addition of 175 GW renewable by 2022.
- The challenge for System Operator to handle it through conventional generation with proper tariff / compensation / incentive mechanism.

Need for 'Flexible' Systems:

- Flexible Generation
- Flexible Transmission- FACTs, HVDC
- Flexible Distribution- Price responsive demand
- Flexible Markets -

More Frequent market operation, Ancillary services, Demand response

Policy/ Regulatory Framework for Flexibility:

- Incentivizing and Paying for flexibility

System Reserve Requirement: Storage

POLICY IMPLICATIONS

- **Incentivize Flexibility of Conventional Generation:**
 - Comprehensive tariff regulations regarding flexibility of conventional generators.
 - Recognize performance criteria, such as ramping, specified start-up or shutdown times.
- **Incentivize Flexibility of Hydro Generation**
 - To use the full capability of hydro and pumped stations.
 - Synchronous Condenser mode operations
 - Hydro plants already designed for pumped storage operation are to be made functional for operating in pumping mode
 - Peaking support to be rewarded



CERC approach paper

Fixed Charge – Split : for 'Flexible' Systems:

- Off-Peak month Fixed Charge: 80% of AFC
- Peak month Fixed Charge : 20% of AFC with 25% hike

Peak and off-peak months for each generating station will be declared by the appropriate RLDC by considering load profile of beneficiaries

Transmission availability– Split :

- Off-Peak month availability
- Peak Fixed month availability



COD related issues

- Delay in COD of transmission / generation system due to Non-availability of evacuation system and/or adequate load.
- The procedure of trial operation for bay equipment, Inter-connecting transformer, Reactors, Fixed Series Compensation, STATCOM to be specified.
- Completion of data telemetry and communication is highly required for RLDCs/ NLDC/ SLDCs to monitor trial run and Restricted Governing mode of Operation (RGMO) in case of generating station.
- Delay in the commercial operation:
 - Due to factors beyond control.
 - Non-commissioning of associated transmission system
 - Due to non- commissioning of downstream or upstream system

Storage- Importance



- Enhance reliability of delivery of intermittent nature of renewable power.
- Can avoid dispatch of costly generation in peak hours.
- An alternative method of providing spinning reserves or ancillary support services.
- Reduction of greenhouse gas emissions caused by wasteful excess capacity.
- Need for major augmentation of new transmission grid can be reduced.
- Line congestion and line-loss minimization through distributed storage
- Peak loading (and overloading) reduction of transmission lines, storage can extend the life of existing infrastructure;
- Pivot role in black start operation during emergency preparedness.

ERLDC, POSOCO

