

Huge unutilized potential of Demand Response for tackling renewable intermittency

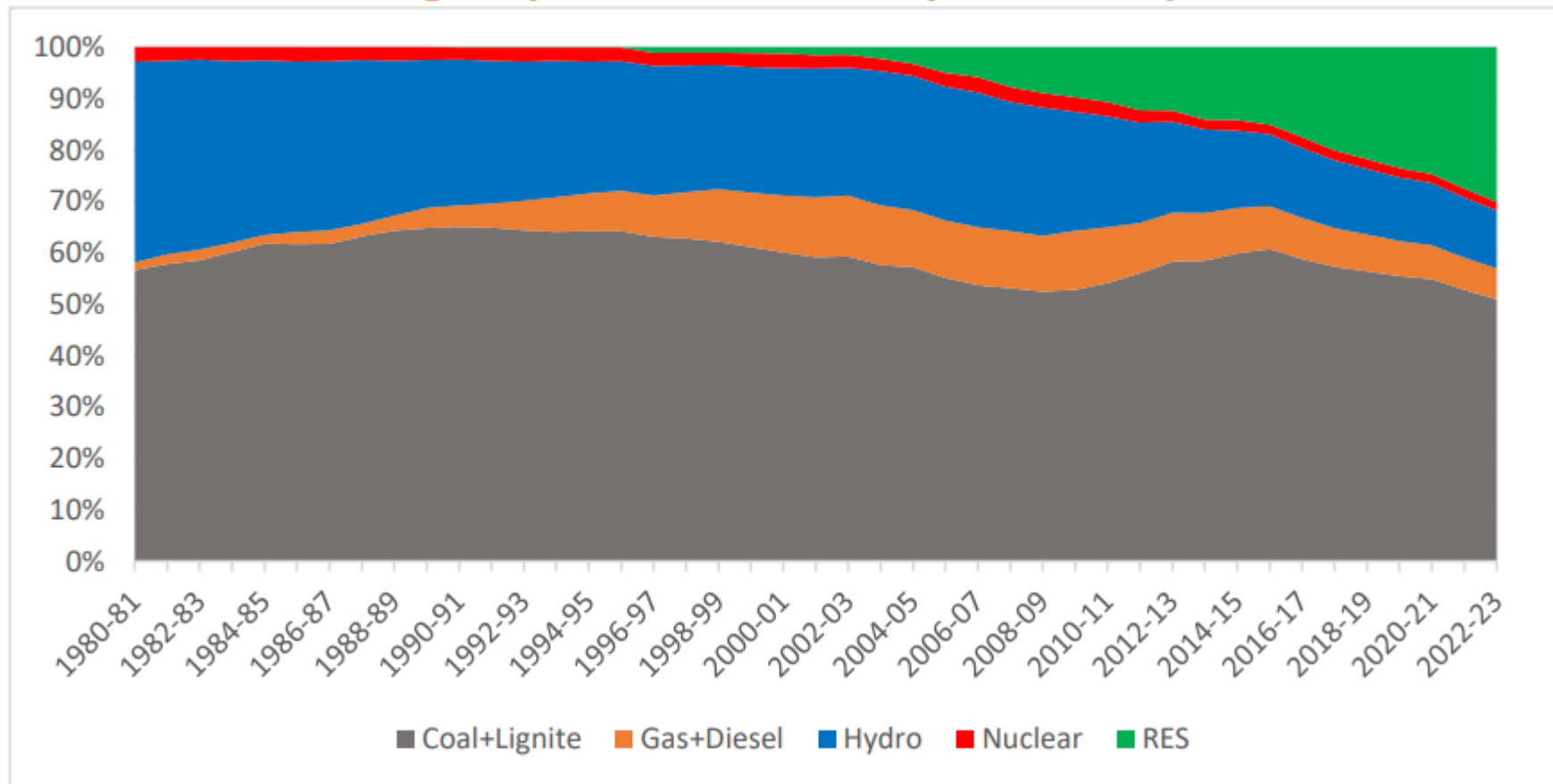
Session 3.2: Status and Opportunities for DSM in Asia and the Pacific

*Pankaj Batra, Senior Advisor,
IRADe & Ex Chairperson, CEA*



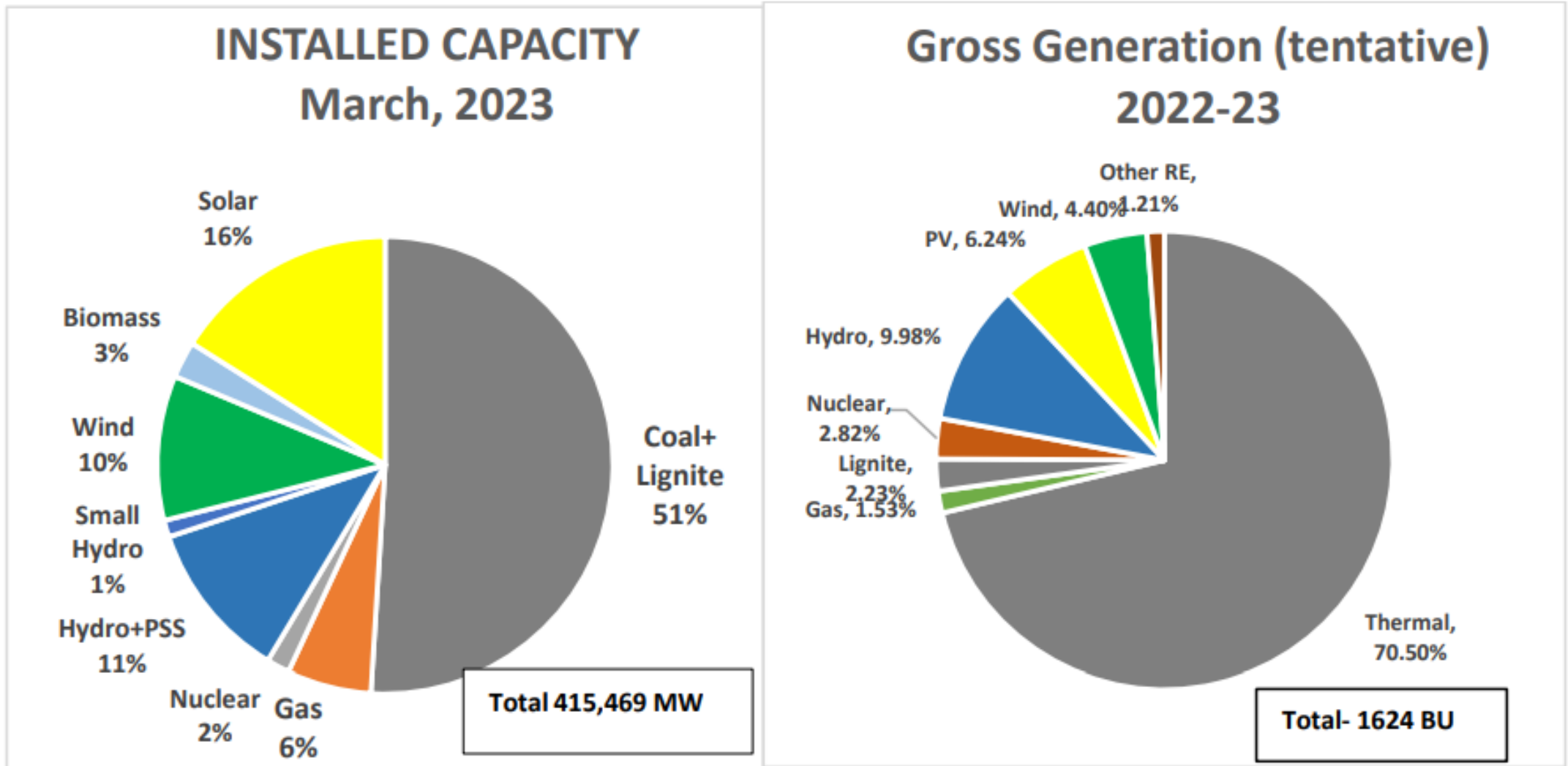
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Installed capacity mix of the country since the year 1980

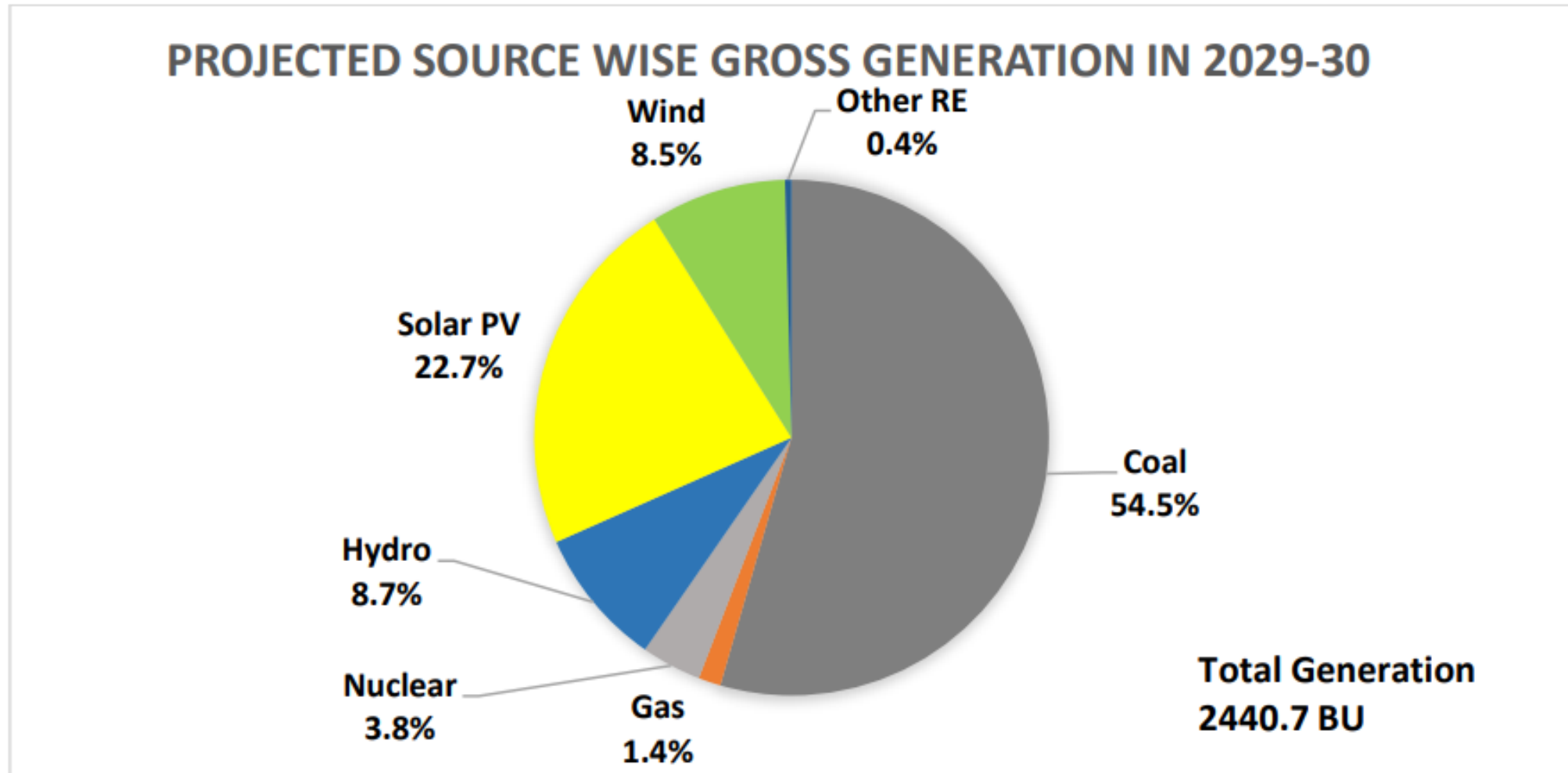


CEA – Central Electricity Authority, the technical arm of the Ministry of Power

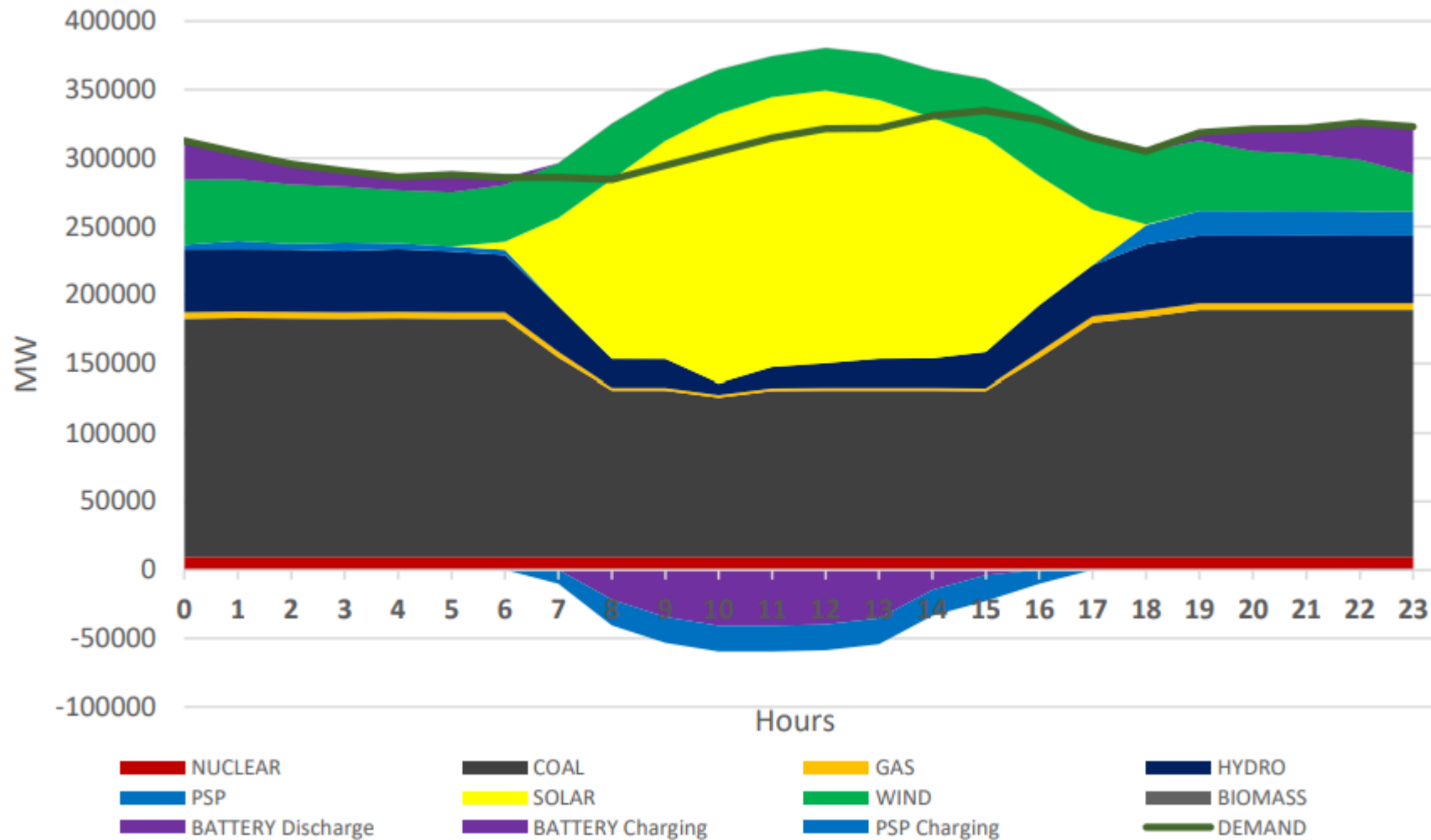
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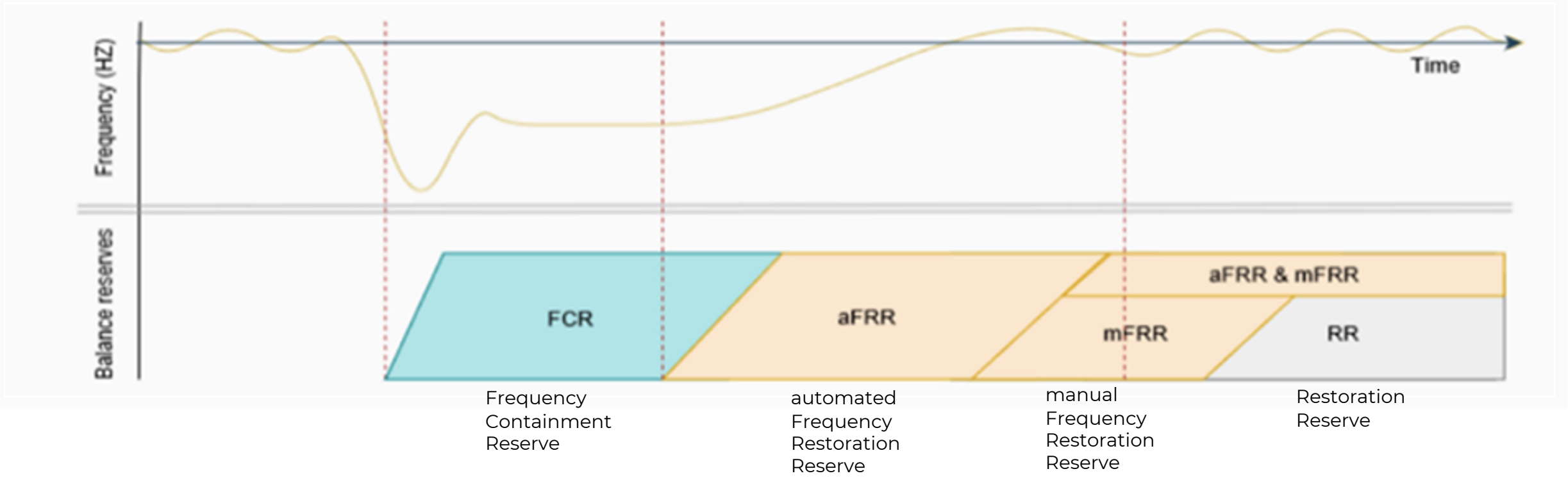


System Operators procure various products in order to keep the frequency at 50Hz

Primary Reserve Market

Secondary Reserve Market

Tertiary Reserve Market



Policy initiatives for Demand Response - India

Tariff Policy 2016.

“Smart meters have the advantages of remote metering and billing, implementation of peak and off-peak tariff and demand side management through **demand response**. These would become essential in future for load-generation balancing due to increasing penetration of intermittent type of generation like wind and solar power.”

Definition of Demand Response

Indian Electricity Grid Code.

“**Demand Response** means reduction in electricity usage by end customers from their normal consumption pattern, manually or automatically, in response to high UI charges being incurred by the State due to overdrawal by the State at low frequency, or in response to congestion charges being incurred by the State for creating transmission congestion, or for alleviating a system contingency, for which such consumers could be given a financial incentive or lower tariff;”

Central Electricity Regulatory Commission (Ancillary Services) Regulations, January 2022

- “**Demand Response**” means variation in electricity consumption by end consumers or drawal by a control area, on standalone or aggregated basis, as per system requirement identified by the Nodal Agency;
- These regulations shall be applicable to regional entities, including entities having energy storage resources and entities capable of providing **demand response** qualified to provide Ancillary Services and other entities as provided in these regulations

Energy Efficiency Directive of the European Union, 2012

- ensure that national regulatory authorities **encourage demand side resources, such as Demand Response, to participate alongside supply in wholesale and retail markets.**”
- “Subject to technical constraints inherent in managing networks, Member States shall ensure that transmission system operators and distribution system operators, **in meeting requirements for balancing and ancillary services, treat Demand Response providers, including aggregators, in a non-discriminatory manner, on the basis of their technical capabilities.**”

Directive of the European Union, 2019 – DR through Aggregators

“Member States shall allow and foster participation of demand response through aggregation.”

Industry

- Furnaces, ovens, boilers and reheaters:
- Dryers, evaporators and blowers:
- Pumps and Compressors:
- HVAC units and heat pumps:
- Hoist and conveyor drives, mills:

Commercial

- HVAC & Cold Storage:
Heat pumps & Electric heating:
- Fans & ventilation systems:
- Lighting systems: smart street lighting
- Pump & Compressors:

Modes for implementing Demand Response

- Through Aggregators
- Automated Demand Response

Domestic Demand side flexibility can also help stabilize the power system – Domestic Appliances

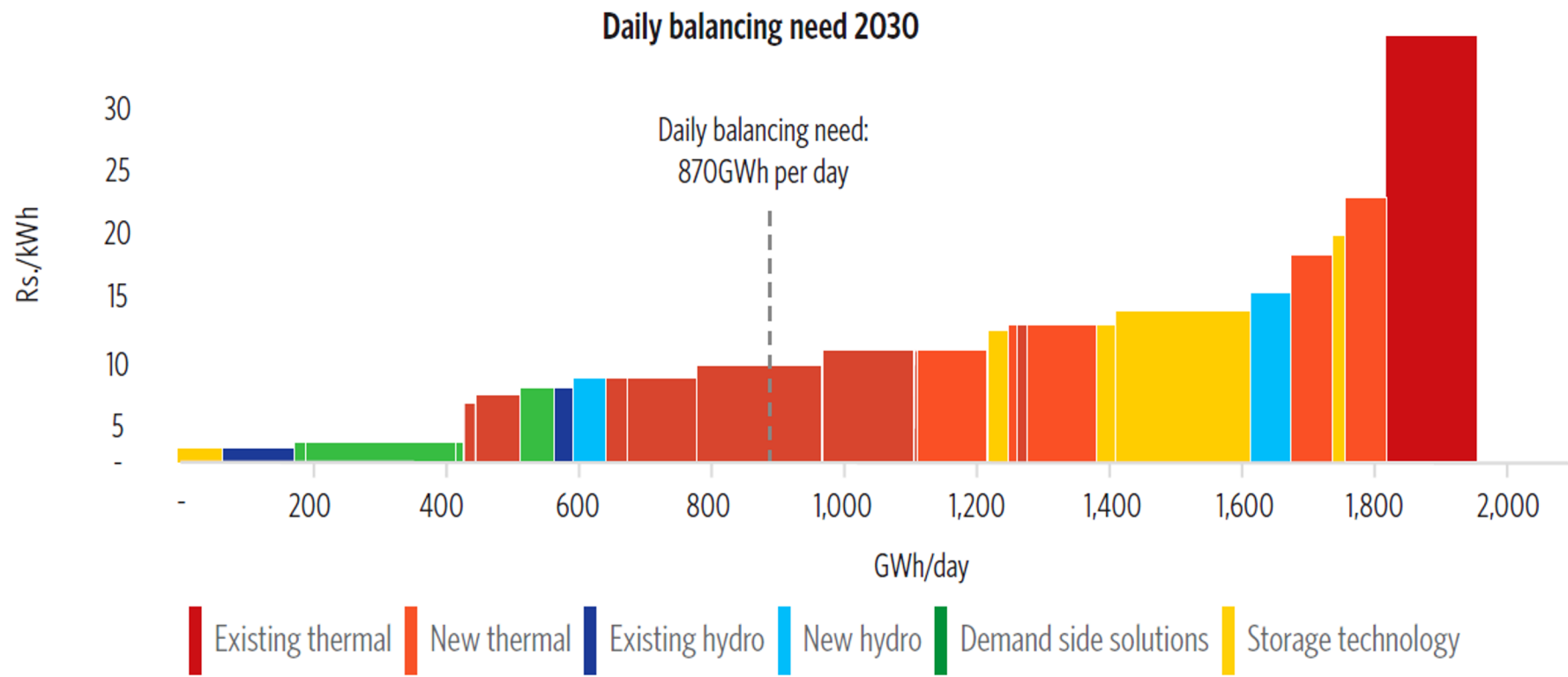


Demand side flexibility – Smart Chargers



Potential of Demand Side Flexibility in India

Demand-side flexibility is more cost-effective than other balancing methods



Source: Based on CPI Energy Finance Report in collaboration with TERI and NREL, Feb'20

Thank You.

