



## National RA Framework and Model RA Regulations



*Presentation for*

## Capacity Building Workshop on Resource Adequacy for Karnataka

16 December 2024



## Overview of RA



## National Framework



## State Model Framework



## State Updates

# Overview of RA

## What is RA?

- RA entails planning of **generation and transmission resources** for **optimally** and **reliably** meeting the **projected demand** in compliance with specified **reliability standards** with a focus on the **integration** of RE, storage systems, and demand response measures.
- Provides the **tools** to determine whether there are enough resources and, if not, what **type of resource** is needed to meet reliability needs.

## Why RA?

- Well-designed system planning and RA frameworks are critical to **scaling** renewable deployment with less **curtailment** and less **financial and operational** stress on **conventional assets**.
- System planning and RA analysis can help **facilitate generation capacity sharing** among states, increasing the utilization of existing generation assets.

Maintaining a reliable power supply

Optimizing cost-effectiveness

Promoting RE integration



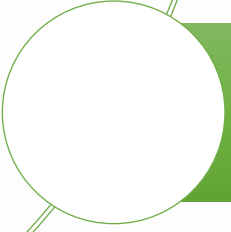
**Assessment:** quantifying size, frequency, duration, and timing of capacity shortfall is critical to finding the right resource solutions



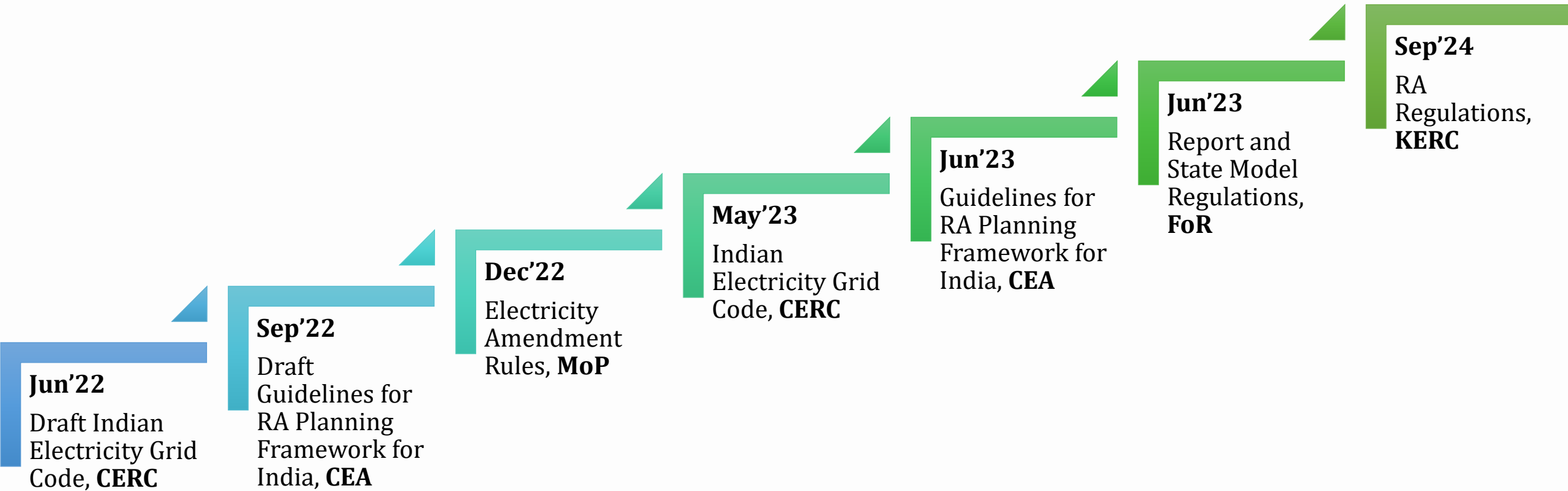
**Static v/s. Dynamic:** conventional approach of designing a system solely to meet conditions via a static PRM is no longer appropriate



**Resource Diversity:** different resources can bring different capabilities and it is important to capture this diversity in an optimal and a least-cost manner



**Sharing of Resources:** planning in silos may lead to over capacity and thus focus should be on to share available resources to reduce overall system costs.

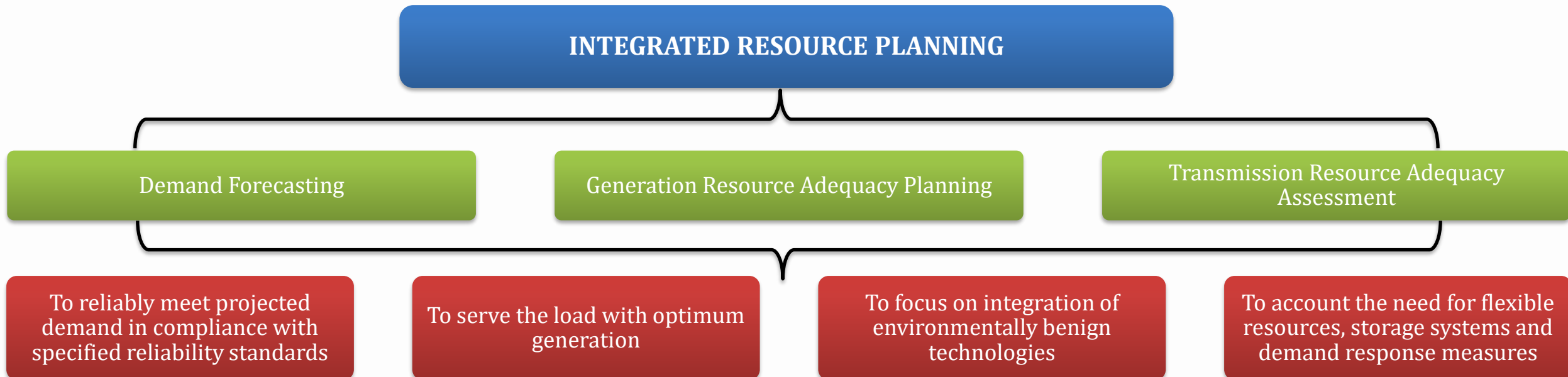


# National Framework

- **Objective (S16):** *"...A Guideline for assessment of Resource Adequacy during the generation planning stage (one year or beyond) as well as during the operational planning stage (up to one year)" by Central Govt. within 6 months of commencement of these rules."*
- **SERCs to frame RA Regulations** in acc. with Guidelines issued by the Central Govt. and Model Regulations by FOR.
- **DLs to formulate RA plans in accordance with SERC Regulations** and seek approval of the Commission.
- **SERCs may determine non-compliance charges** for failure to comply with the RA target approved by the Commission.
- **NLDC and RLDCs to carry out national and regional level annual RA assessment** for operational planning in accordance with guidelines issued by the Central Govt.
- **SLDCs to carry out state level annual RA assessment** for operational planning in consultation with all the concerned stakeholders and in accordance with guidelines issued by the Central Govt. and SERCs.
- **SLDCs to review operational RA on daily, monthly, and quarterly basis.**

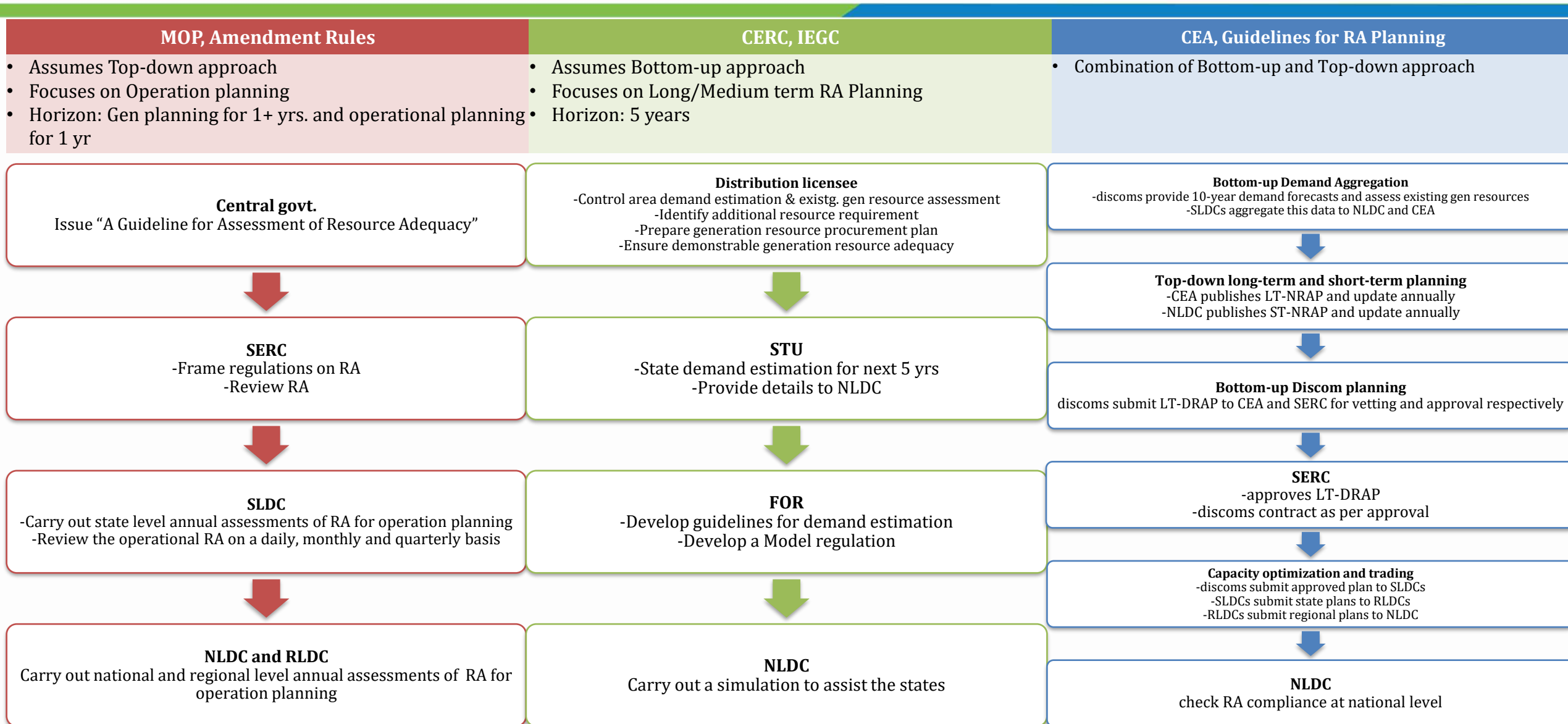


- **Objective (Ch.2):** “...for **reliably** meeting the **projected demand** in compliance with **specified reliability standards** for serving the load with **optimum generation mix** with a focus on **integration** of environmentally benign technologies after taking into account the need, inter alia, for **flexible resources**, storage systems for energy shift and demand response measures for managing the **intermittency and variability** of renewable energy sources”



- **Objective:** “...ensure sufficient tie up of capacities to meet **resource adequacy requirements on different time horizons**. Central Electricity Authority (CEA) hereby is issuing the guidelines for Resource Adequacy framework for the Indian electricity sector.”
- **Key design parameters for RA framework:** PRM, LOLP, Expected Energy Not Served (EENS), and Normalized ENS.
- The capacity planning by utilities should be developed through a **Resource Adequacy Plan**:
  - Assess the required capacity to be contracted for LT, MT, ST optimized through a MILP model.
  - Undertake a least-cost generation optimization to meet the demand while minimizing the overall system cost.
- **4 plans viz, Long-term National RAP, Short-term National RAP, Long-term Discom RAP, and Short-term Discom RAP.**
- To be determined based on the availability and access after considering sharing of reserves from other utilities/states.
- **Modelling constraints:** PRM, RAR, portfolio balance, generation, RPO, storage, operating (spinning) reserve, DR etc.

# Comparison of Existing RA Provisions



FOR Model Framework

State level RA  
framework

## Resource Adequacy Framework

1

### Demand Assessment and Forecast

#### 1.1 Demand Forecast (LT/MT/ST)

Forecast peak demand (MWs) and energy requirement (MUs) over short (1 year), medium (5 years), and long-term horizons considering various input parameters.

2

### Generation Resource Planning

#### 2.1 Capacity Crediting

CC reflects the amount of power a resource can reliably provide during peak hours and helps assess realistic availability of resources for reliably meeting peak.

#### 2.2 Planning Reserve Margin

PRM is the percent of projected resources above peak demand to capture contingencies such as extreme weather event, changing consumption patterns, etc

#### 2.3 RA Requirement and Allocation

RA requirement and allocation is the amount of incremental capacity required to meet projected peak demand + PRM considering CC of various resources.

3

### Procurement Planning

#### 3.1 Procurement Resource Mix

This involves planning for procurement of different types of resources compliant with RPO, DR, ESO and reserve planning meeting with Reliability standards

#### 3.2 Procurement Type and Tenure

This involves qualification of RA requirement and allocation into short/medium/long-term requirement to assist necessary procurement

#### 3.3 Capacity Trading/Sharing Construct

Capacity trading/sharing constructs enable optimal procurement via various mechanism such as bilateral contracts, auctions, capacity markets etc.

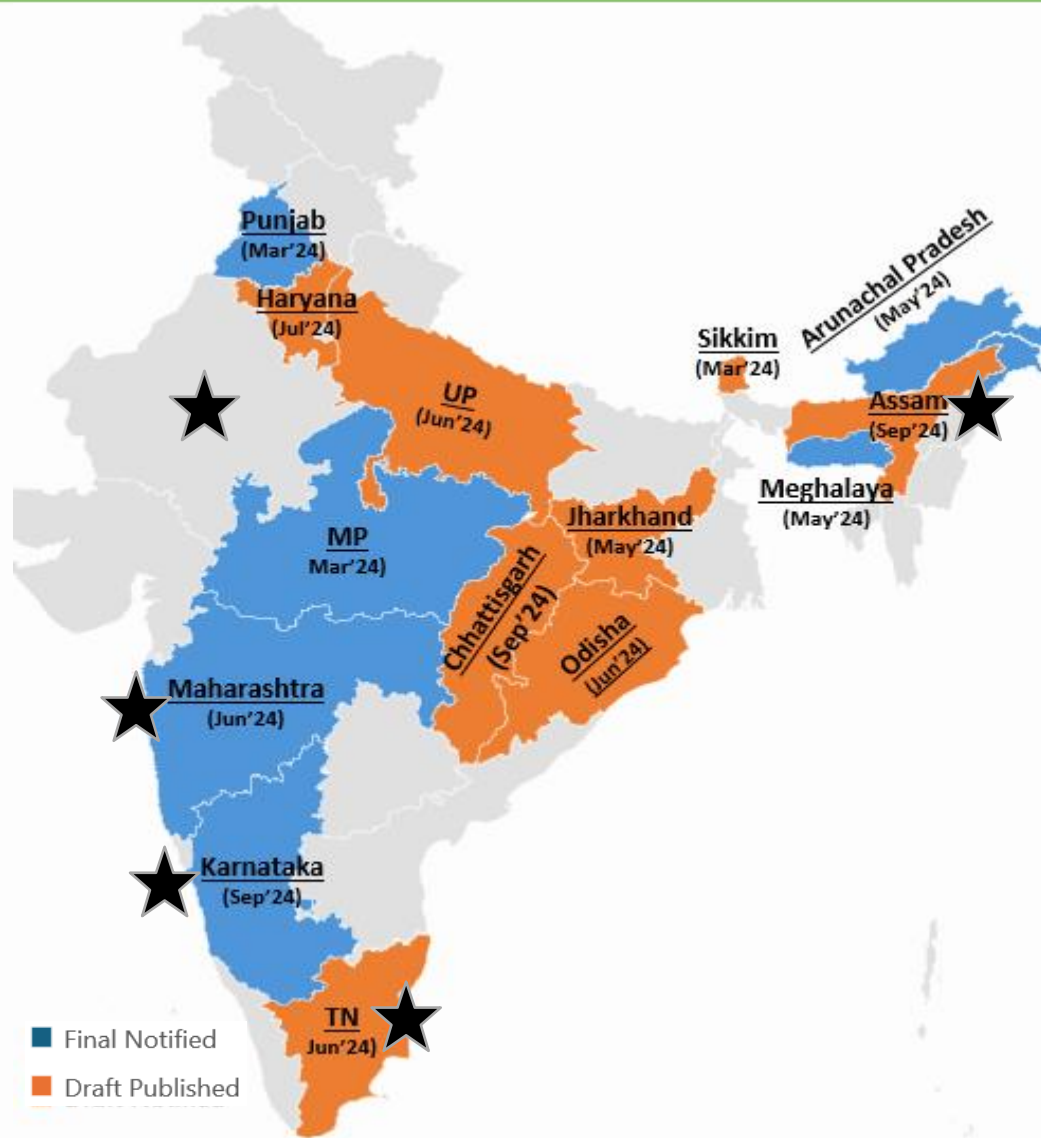
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### Monitoring and Compliance

#### 4.1 Compliance Monitoring

Monitoring and compliance ensure RA requirement is met on a continuous basis and the system operates in a reliable manner.

# State-level Updates & Notifications



State	Notifications
<b>Final Notified</b>	
Arunachal Pradesh	<a href="#">Final on 14 May 24</a>
Karnataka	<a href="#">Final on 23 Sep 24</a>
Madhya Pradesh	<a href="#">Final on 05 Mar 24</a>
Maharashtra	<a href="#">Final on 21 Jun 24</a>
Meghalaya	<a href="#">Final on 09 May 24</a>
Punjab	<a href="#">Final on 15 Mar 24</a>
<b>Draft Published</b>	
Assam	<a href="#">Draft on 06 Sep 24</a>
Chhattisgarh	<a href="#">Draft on 04 Sep 24</a>
Haryana	<a href="#">Draft on 28 Jul 24</a>
Jharkhand	<a href="#">Draft on 09 May 24</a>
Odisha	<a href="#">Draft on 4 Jun 24</a>
Sikkim	<a href="#">Draft on 14 Mar 24</a>
Tamil Nadu	<a href="#">Draft on 13 Jun 24</a>
Uttar Pradesh	<a href="#">Draft on 3 Jul 24</a>

# 1: Demand Assessment and Forecasting (1/2)

## Background

### Brief Description:

- Current methodology is not uniform across the country and estimated using simple spreadsheet based CAGR or trend analysis in many cases.
- Scientific and hourly forecasting helps identify overall resource requirement to meet demand with minimal cost implications in terms of optimal capacity planning without compromising on reliability and at the same time without excess or deficit capacity, making the planning more realistic.
- Important to consider various demand drivers such as EVs, DERs, change in weather patterns, consumption practices etc.

### Summary of Discussions:

- **LT demand forecasting:** economically plan the new generating capacity and transmission networks over 10 to 20 years.
- **MT demand forecasting:** scheduling of fuel supplies, maintenance program, financial planning, and tariff formulation up to 5 years.
- **ST demand forecasting:** planning start-up and shut down schedules of generating units, reserve planning and the study of transmission constraints over 1 day up to 1 year.



# 1: Demand Assessment and Forecasting (2/2)

## FoR Recommendation

Discoms to undertake demand forecasting as per the following steps:



### Additional Inputs

- Consumer Data
- Historical Demand Data
- Weather Data
- Demographic, Econometric Variables
- T&D losses
- Actual electrical energy requirement & availability including curtailment
- Peak electricity demand & peak met along with changes in demand profile (e.g.: agricultural shift, time of use etc.)
- Historical hourly load shape

### Consumption profile of consumers

- Domestic
- Commercial
- Public Lighting
- Public Water Works, Irrigation
- LT Industries
- HT Industries
- Railway Traction
- Bulk (Non-Industrial HT Consumers) Supply
- OA
- CPP
- Insights from load survey
- Contribution of consumer category to peak demand,
- seasonal variation aspects

### Policies and Drivers

- LED penetration
- Efficient fan penetration
- Efficient Appliance penetration
- Increase in households using electrical appliances for cooking
- Increase in commercial activities
- Increase in number of agriculture pumps and solarization
- Reduction in Specific Energy Consumption of Tea plants
- DSM and Distributed Energy Resources
- EVs and OA
- National Hydrogen Mission
- Reduction of AT&C losses

### Forecasting Methodologies

- Trend analysis
- Compound annual growth rate
- Econometrics
- ARIMA
- AI including machine learning, ANN
- Partial End-Use Method



Parameters	Specifics	FoR	Maharashtra	Karnataka	Tamil Nadu	Assam
Horizon	ST	1	1	1	1	1
	MT	5	5	Not Mentioned	5	5
	LT	>5	5-10	10	10-20	>5
Granularity	ST	Hourly/sub-hourly	Hourly/sub-hourly	Hourly/sub-hourly	Hourly	Hourly/sub-hourly
	MT	Hourly/sub-hourly	Hourly	Not Mentioned	Hourly	Hourly
	LT	Hourly/sub-hourly	Monthly peak and off-peak	Hourly/sub-hourly	Hourly	Monthly peak and off-peak

**All states have regulated scientific and mathematical demand forecasting**

# 2.1: Capacity Crediting (1/5)

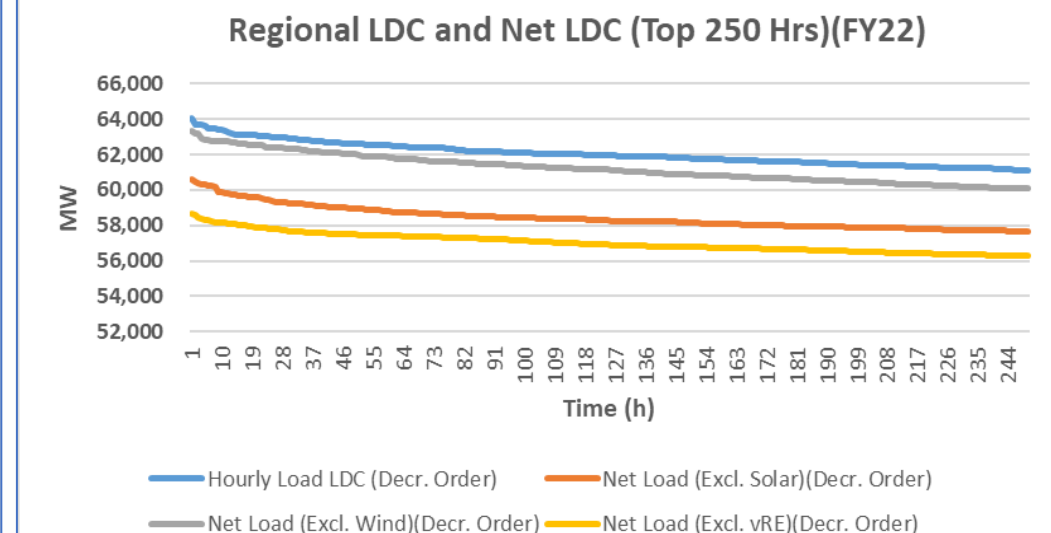
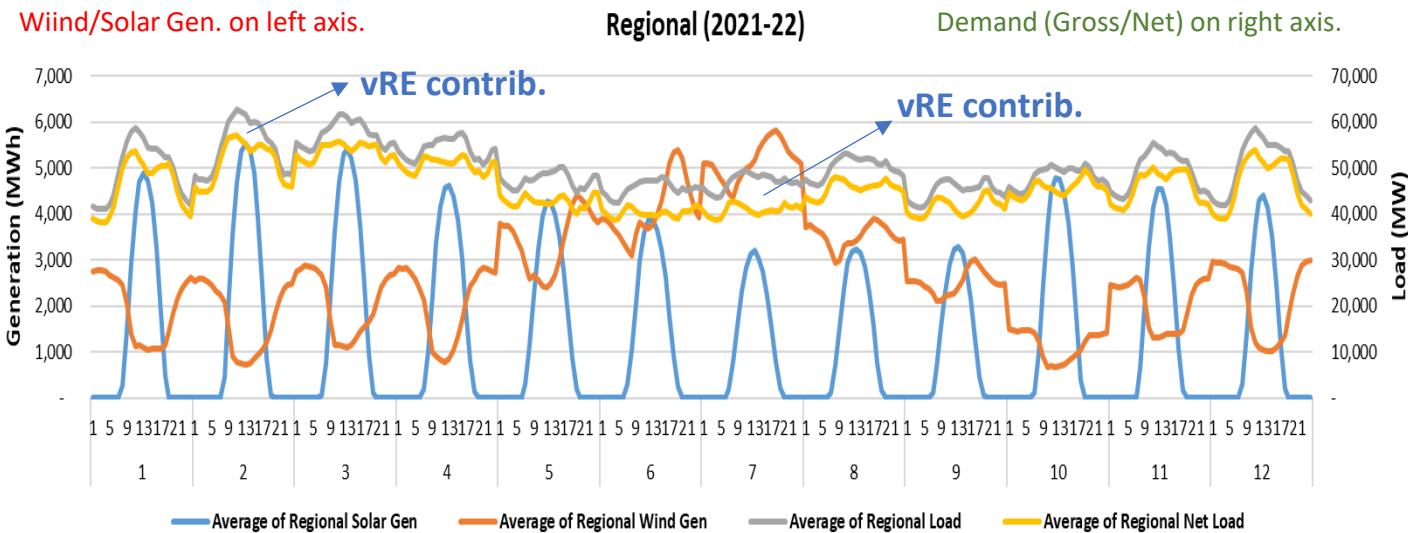
## Background

### Brief Description:

- CC for generation resources represents its ability/dispatchability of the resource to meet the demand and its contribution towards meeting the peak demand.
- CC of RE resources represents the amount of power it can reliably provide during peak hours =  $(\text{Total Generation for top } x \text{ hours}) / (\text{Total Capacity for top } x \text{ hours})$ .
- It is calculated to ensure that planning accounts for capacity discounting during peak hours and stays reliable.

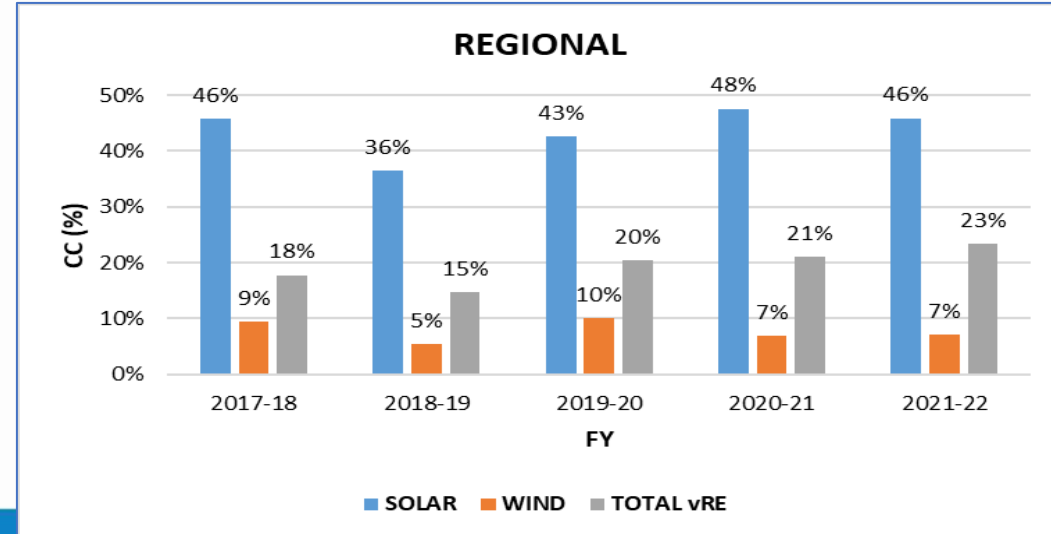
### Summary of Discussions:

- CC of RE resources is linked to generation profile of type of resource as well as load profile/consumption pattern of load control area.
- A Load Duration Curve (LDC) based approach can be implemented for CC computation covering 5 historical years to factor for cyclical variation / changes in demand patterns.
- For non-RE CC, parameters such as fuel availability, outages (planned) etc. should be considered because of which CC may not be 100% of resources such as thermal and nuclear.

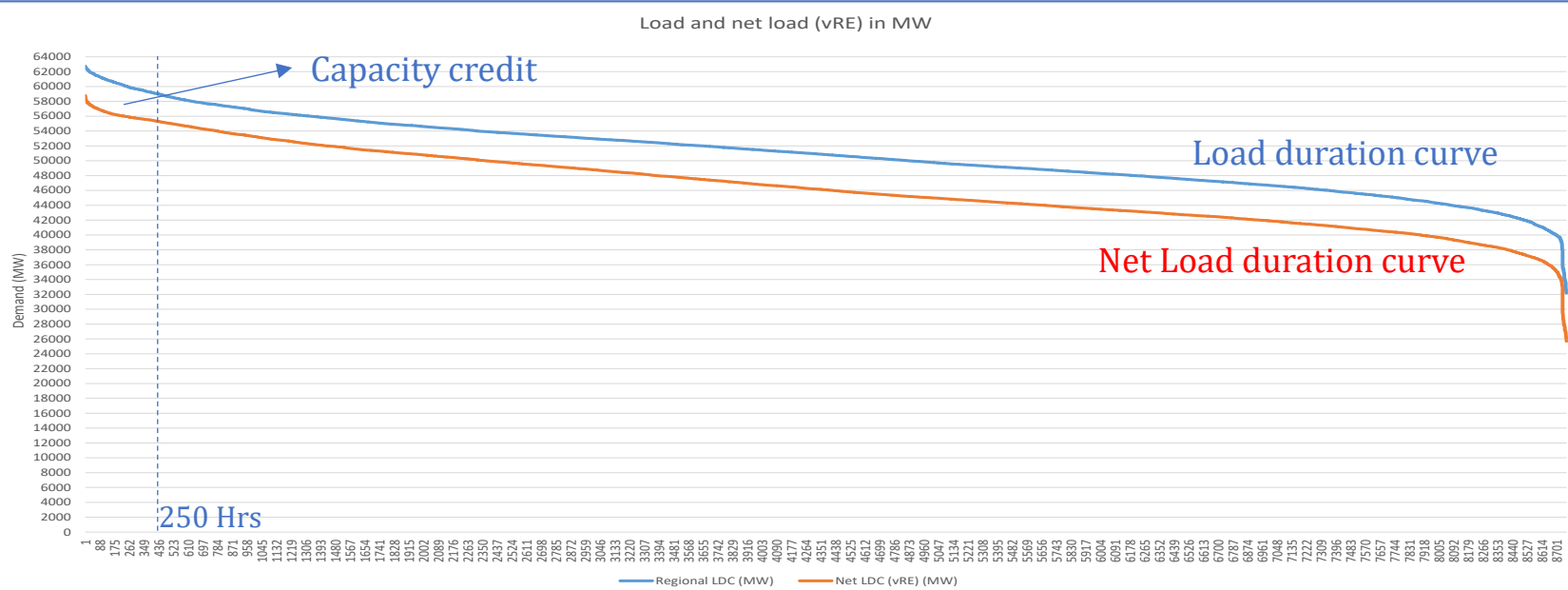


- Solar generation hours from 6:00 hrs to 18:00 hrs
- Wind is complementary to solar in non-windy months, generating from 19:00 hrs to 7:00 hrs
- In windy / rainy months, wind generation pattern gradually shifts from night to day.
- Hourly load and net load is arranged in descending order and difference between the two represents the contribution of vRE generation to meet demand as its CC factor

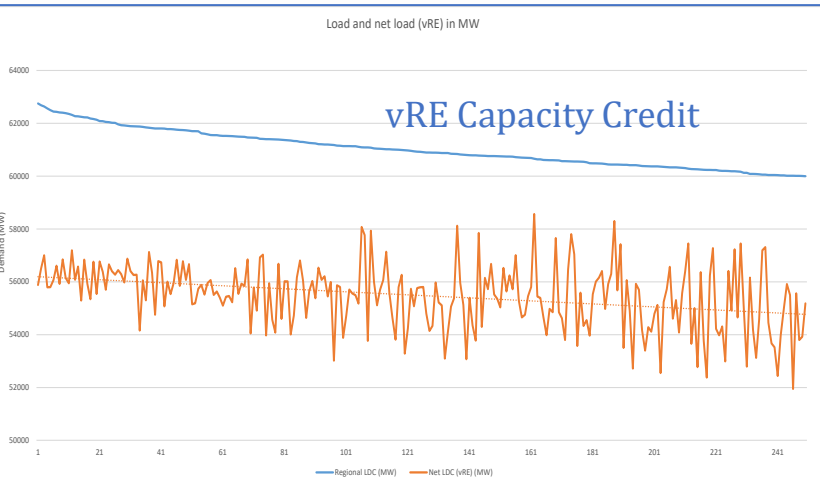
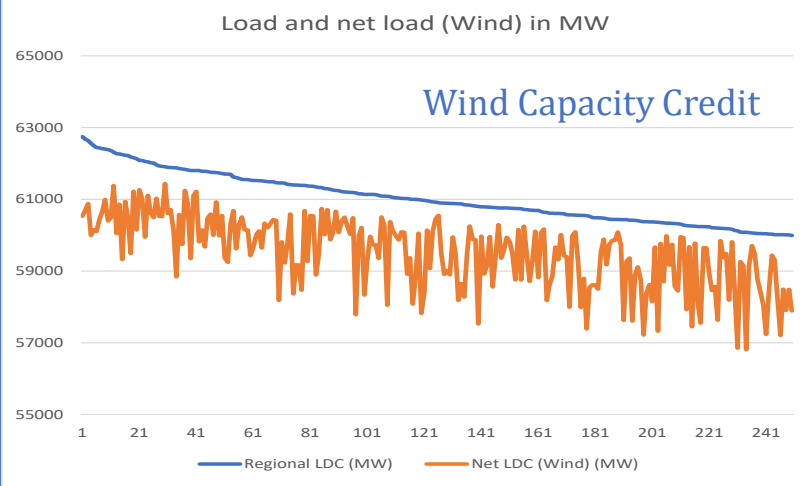
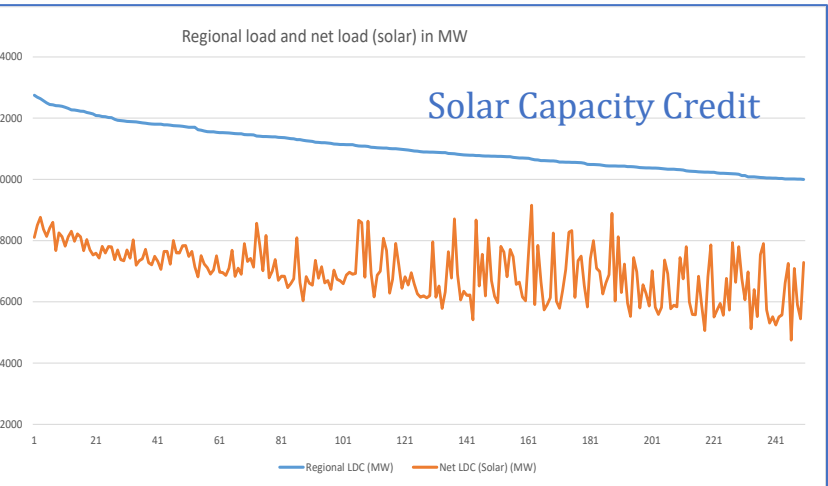
IC on 31/3/22 (MW)	
Solar	Wind
10,159	14,190



# 2.1 CC Calculation using LDC Method (3/5)

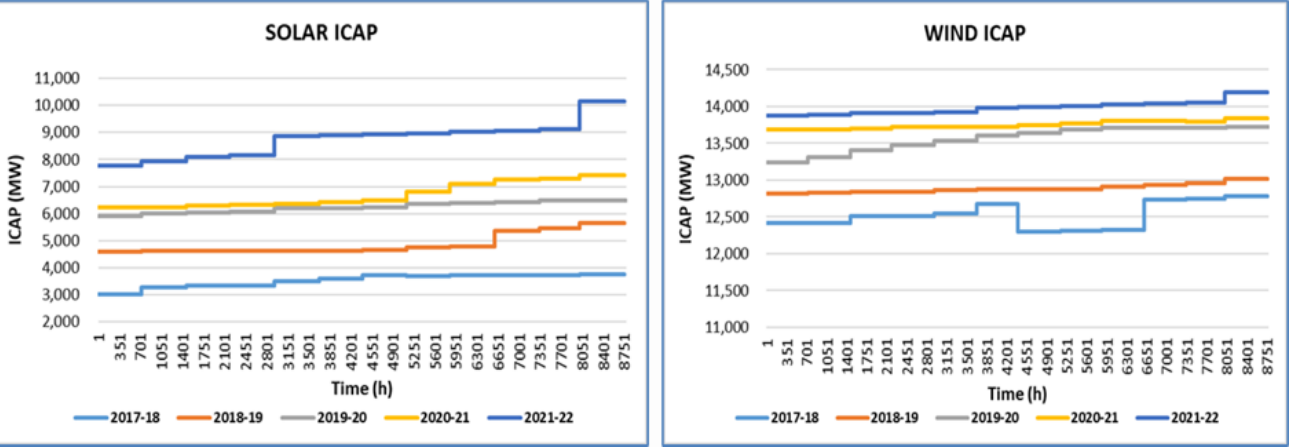


Sample CC calculation_250 Hrs			
	Installed capacity (MW) x 250 Hrs	Total generation (in top 250 Hrs)	CC (%)
Solar	20,74,000	10,10,980	49%
Wind	29,25,000	3,75,804	13%
Total vRE	49,99,000	13,86,784	28%

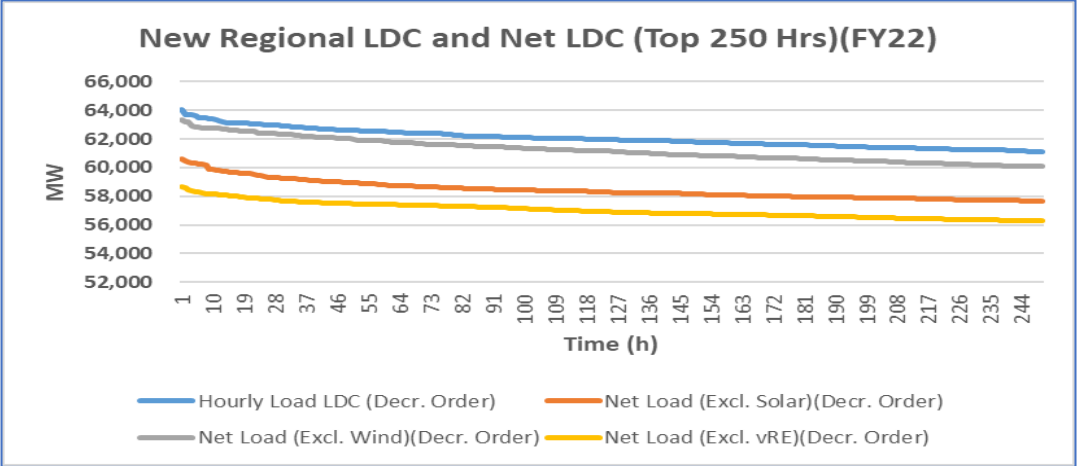


# 2.1 CC Calculation using LDC Method (4/5)

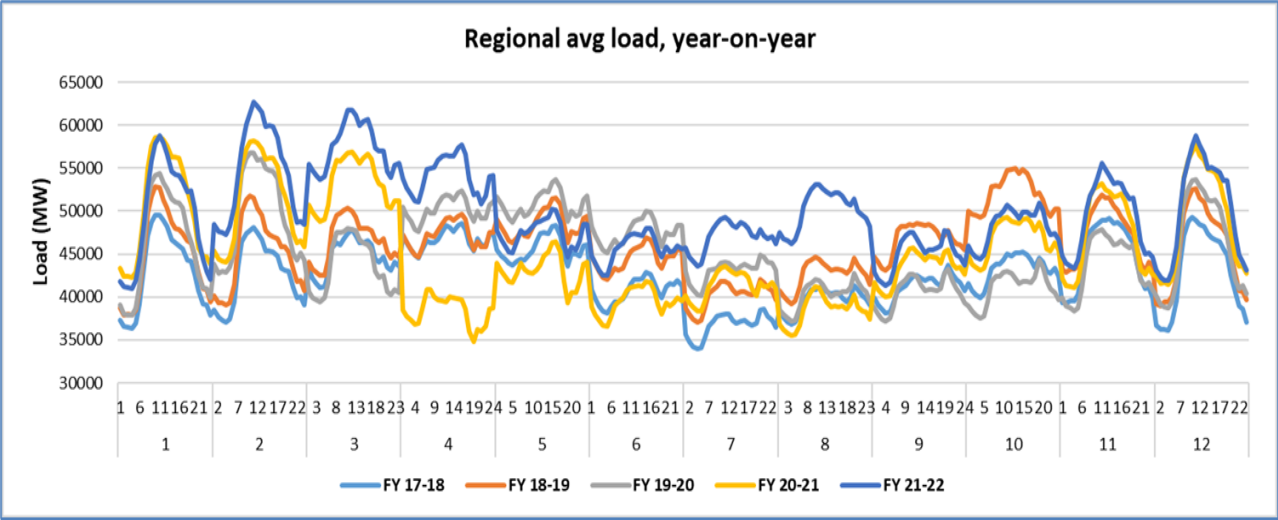
RE (Solar and Wind) Capacity Addition (MW) in WR



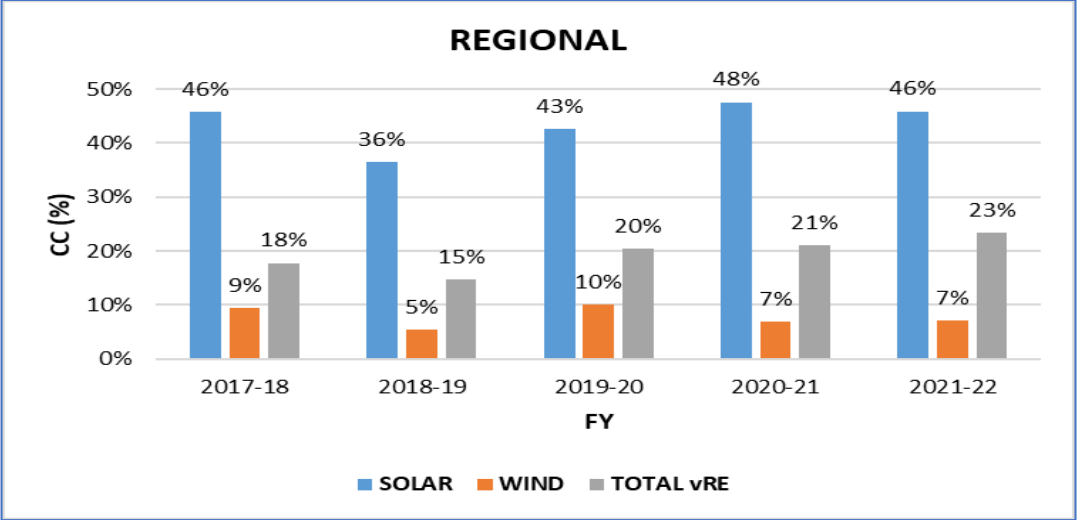
Net Load based approach (top 250 hrs) for CC factor



vRE Generation (MWh) in WR over period



Avg. (5 yr) CC factor – Solar (44%), Wind (8%), vRE (19%)



# 2.1: Capacity Crediting (5/5)

## FoR Recommendation

- **Methodology:**
  - For each year, the hourly/sub-hourly recorded Gross Load shall be arranged in descending order.
  - For each hour, the Net Load is calculated by subtracting the actual wind or solar generation corresponding to that load for 8760 hours (or time-block) and then arranged in descending order similar to Step 1.
  - The difference between these two load duration curves represents the contribution of capacity factor of wind generation or solar generation, as the case may be
  - Installed capacity of wind or solar generation capacity is summed up corresponding to the top 250 load hours.
  - Total generation from wind or solar generation corresponding to these top 250 hours is summed up.
  - **Resultant CC factor= (Sum of RE Generation for top x hours) / (Sum of RE Capacity for top x hours)**
  - Undertaken for each year for past five-years and the resultant CC is the average of CC values of past 5 years.
- **ISTS-connected contracted RE:** CC based on where such resource is located and as specified by Authority or the Commission.
- **Hydro:** based on water availability and different for RoR and dam-based
- **Thermal:** based on fuel availability

Parameters	FoR	Maharashtra	Karnataka	Tamil Nadu	Assam
Existing Resources	Top Net Load Hours	Top Net Load Hours	Top Demand Hours	Top Net Load Hours	Top Net Load Hours
New Resources	Top Net Load Hours	Top Net Load Hours	Top Net Load Hours	Top Net Load Hours	Top Net Load Hours
Future Methodology	Top Net Load Hours	Top Net Load Hours	ELCC	Top Net Load Hours	Top Net Load Hours
Hydro	Water Availability	Water Availability	Water Availability	Water Availability	Water Availability
Thermal	Fuel Availability	Fuel Availability	Fuel Availability	Fuel Availability	Fuel Availability
BESS	Not Mentioned	Top Net Load Hours	Not Mentioned	Not Mentioned	Not Mentioned

**Most states have regulated Top Net Load Hours methodology**

## 2.2: Planning Reserve Margin (1/2)

### Background

#### Brief Description:

- PRM is a certain percentage of the projected capacity resources available in the system over the projected peak load forecast of the system and is used to ensure the resource adequacy of the system.
- $PRM = (Available\ Capacity - Peak\ Demand) / (Peak\ Demand)$ .
- Currently, PRM is not taken into consideration and assessment is done for each distribution licensee/state separately

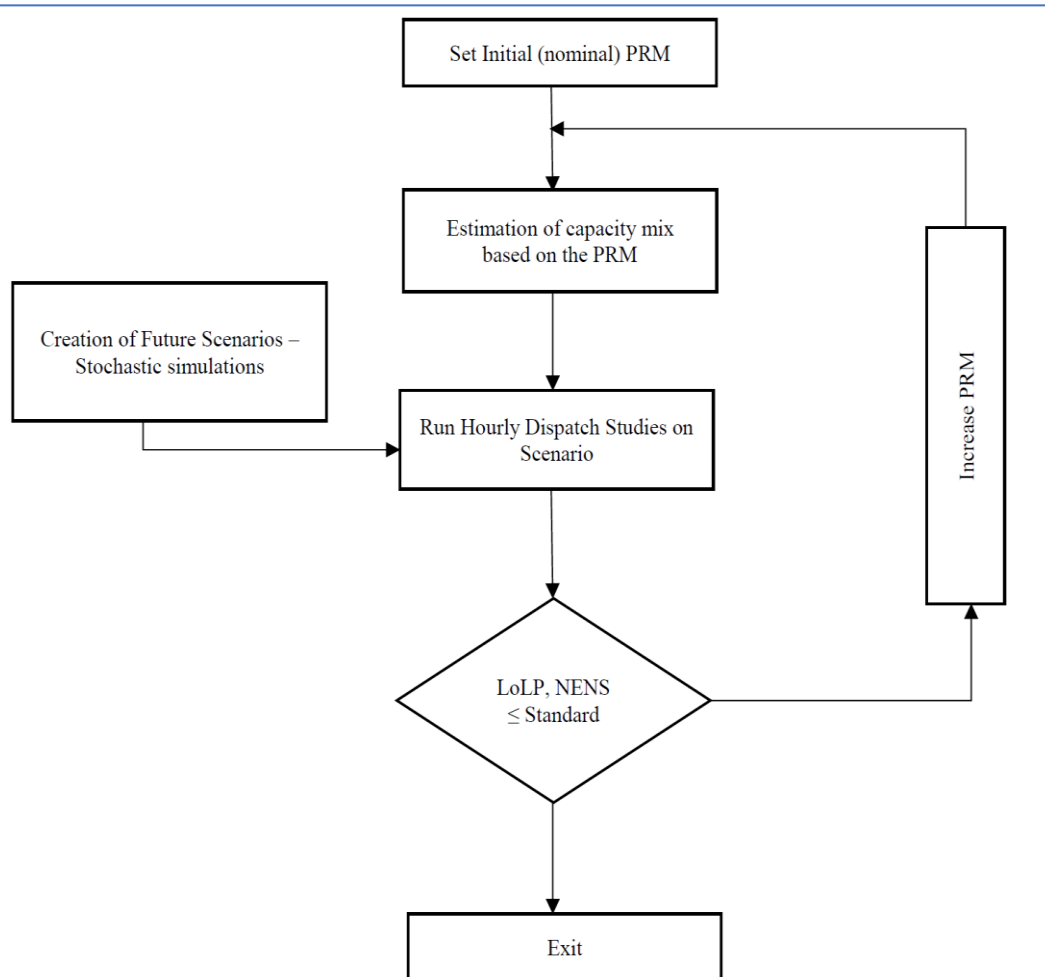
#### Summary of Discussions:

- In U.S., the North American Electric Reliability Corporation (NERC) has set a reliability standard of 1 day outage in 10 years and has established PRM targets (say, 15%). Accordingly, regional operators (ISO) determine the planned and operational reserve margin for their jurisdictions.
- PRM shall ensure availability of capacity to always meet forecasted demand.
- It will not only cover forecasted demand but also unexpected occurrences of outages, extreme weather events, and forecast errors.
- The determination of PRM should factor in available and contracted capacity of existing and planned generation resources.
- The PRM seeks to ensure system reliability to meet the target reliability indices.



## 2.2: Planning Reserve Margin (2/2)

### FoR Recommendation



- Planning Reserve Margin (PRM) as a percentage of peak load represents the excess generation resource or planning reserve required to be considered for the purpose of generation resource planning.
- Such Planning Reserve Margin (PRM) factor (for example, 7%) shall be based on the reliability indices in terms of Loss of Load Probability (LoLP, for example, 0.2%) and Normalized Energy Not Served (NENS, for example, 0.05%) as may be specified by the Authority and the same shall be considered by utilities in their planning for resource adequacy requirement and generation resource capacity planning.
- The capacity planning by the distribution licensee and State level resource adequacy planning by STU/SLDC shall factor in PRM while developing state-level Integrated Resource Plan.

## 2.3: RA Requirement and Allocation (1/2)

### Background

#### Brief Description:

- Resource Adequacy requirement is calculated at the national & regional level by taking the difference of total capacity required considering the PRM and the present available capacity duly factoring capacity credits for generation resources.
- Post that, it is allocated amongst the states based on their contribution toward the regional coincident peak demand
- The allocation of regional RA requirement will ensure appropriate planning and contributions consideration.

#### Summary of Discussions:

- Resource planning to be optimized at regional level/national level as against existing practice of resource planning at State level
- It is preferred that regional level optimized resource planning should be targeted initially, and national level optimization should be targeted during short term operational phase through reserve optimization.
- Allocation of RA requirements at State level within Region can be undertaken by CEA/NLDC based on their contribution to co-incident peak (regional/ national) as part of long-term and short-term resource adequacy plan assessment.

## 2.3: RA Requirement and Allocation (2/2)

### FoR Recommendation

- Based on most probable scenario, the distribution licensee shall undertake development of Medium-term Distribution Resource Adequacy Plan (**MT-DRAP**) and Short-term Distribution Resource Adequacy Plan (**ST-DRAP**) exercise by **31st August** of each year to meet RA target requirement.
- RA requirement planning shall be done with reference to **national coincident peak** to optimize requirement of incremental capacity addition through **annual rolling plan**. **Mid-term review of national RA requirement** planning shall be conducted to check for events of slippages by states, if any.
- While planning RA requirement, the **distribution licensee** shall duly factor in the **allocation of RA requirement** to the state as may be suggested by the **Authority or the NLDC**, as the case may be, based on contribution to National **Co-incident Peak Demand (CPD)** for MT-RA and ST-RA.
- The **Commission** shall **approve MT-DRAP and ST-DRAP** of the distribution licensees by **30th September** of each year for the ensuing year(s) incl. **annual rolling plans**, as the case may be, upon taking into **consideration various scenarios** as well as allocation of **Resource Adequacy requirement allocated** to the State/distribution licensee based on its contribution to the National peak or National RA requirement as determined by Authority or the NLDC or the RLDC , as the case may be.

# 3.1: Procurement Resource Mix

## Background & FoR Recommendation

### Brief Description:

- Once the RA requirement has been identified and allocated, it is important to compute the optimal generation capacity resource mix that can fulfill the requirements in a least-cost manner while maintaining reliability standards.
- The resource mix should also be such that it enables smooth RE integration and can contribute towards RPO and other targets.

### Summary of Discussions:

- Determining the optimal generation capacity resource mix of RA requirement and allocation can ensure maximum and smooth RE integration while avoiding creation of stranded assets.
- Procurement should preferably be done in a scientific and mathematical manner by conducting a least-cost optimization study.

### FoR Recommendation:

- The distribution license shall lay emphasis on the optimal procurement generation resource mix that shall enable smooth RE integration in its portfolio of power procurement resource options while meeting reliability standards.
- Optimization techniques and least-cost modelling shall be employed in order to avoid stranding of assets.
- Procurement shall be consistent with the identified resource mix and overall national and state policies.

## 3.2: Procurement Type and Tenure

### Background & FoR Recommendation

#### Brief Description:

- It is important to define the timeline of capacity procurement (LT/MT/ST) and determining capacity quantum across planning horizon.
- The utilities must plan how much capacity they need to procure/contract in what timeframe (MT/ST) to comply with the resource adequacy requirement

#### Summary of Discussions:

- Information regarding the capacity surplus/deficit is required for deciding the amount of capacity the states are supposed to procure either bilaterally (LT/MT) through competitive bidding process or through short term capacity trading/sharing.

#### FoR Recommendation:

- The distribution licensee shall ensure that at the initial level, available capacity within the region shall be optimized subject to the least cost availability considering transmission constraints & cost from outside the region and then across regions if necessary.
- The distribution licensee shall lay greater emphasis on **adequate contracting through LT and MT** arrangements.
- Assessment through **Annual Rolling Plan** shall ascertain **incremental capacity addition** requirement through **MT/ST** upon factoring in existing and planned procurement initiatives of the distribution licensee.

# Procurement Mix and Type/Tenure

Parameters	FoR	Maharashtra	Karnataka	Tamil Nadu	Assam
Procurement Plans	ST-DRAP MT-DRAP	ST-DRAP MT-DRAP LT-DRAP	ST-DRAP LT-DRAP	ST-DRAP MT-DRAP	ST-DRAP MT-DRAP LT-DRAP
Commission Approval of Procurement Plans	ST-DRAP MT-SRAP	ST-DRAP MT-DRAP	ST-DRAP LT-DRAP	ST-DRAP MT-DRAP	ST-DRAP MT-DRAP
LT Share	Lay emphasis on LT and MT	Min. 70%	75-80%	Min. 70%	Min. 70%
MT Share		Min. 20%	10-20%	Min. 20%	Min. 20%
ST Share		Remaining	Remaining	Remaining	Remaining
1 <sup>st</sup> Year Compliance	100%	100%	100%	100%	100%
2 <sup>nd</sup> Year Compliance	90%	90%	90%	90%	90%

**Emphasis is on 85-90% through LT + MT and rest through ST**

# 3.3: Capacity Trading/Sharing Constructs

## Background & FoR Recommendation

### Brief Description:

- Currently, India's short-term market is purely an energy-only market.
- With an increase in RE penetration, power producers have been finding it difficult to sustain stable operations.
- There is no incentive available for producers to set up new capacities and operate the existing ones.
- With capacity trading / sharing mechanism, the additional capacity available can be traded by the respective stakeholders.
- Capacity sharing constructs would enable all the stakeholders to optimize costs and increase reliability of operations.

### Summary of Discussions:

- Currently, no standardized capacity trading/sharing framework is in place.
- For trading/sharing of resources, market-driven auctions for procurement of resources can be conducted to meet the RA requirements.
- The states/discoms can then plan for their procurement accordingly.

### FoR Recommendation:

- The distribution licensee shall factor in the possibility of ST capacity sharing while preparing the RA plan and optimally utilize the platform for inter-state capacity sharing / trading mechanism created by CERC, and optimize the capacity costs as far as possible

# 4: Monitoring and Compliance (1/2)

## Background

### Brief Description:

- To ensure that RA requirements are met on a continuous basis
- To reflect compliance and advance actions for dealing with shortfalls, through annual rolling plans

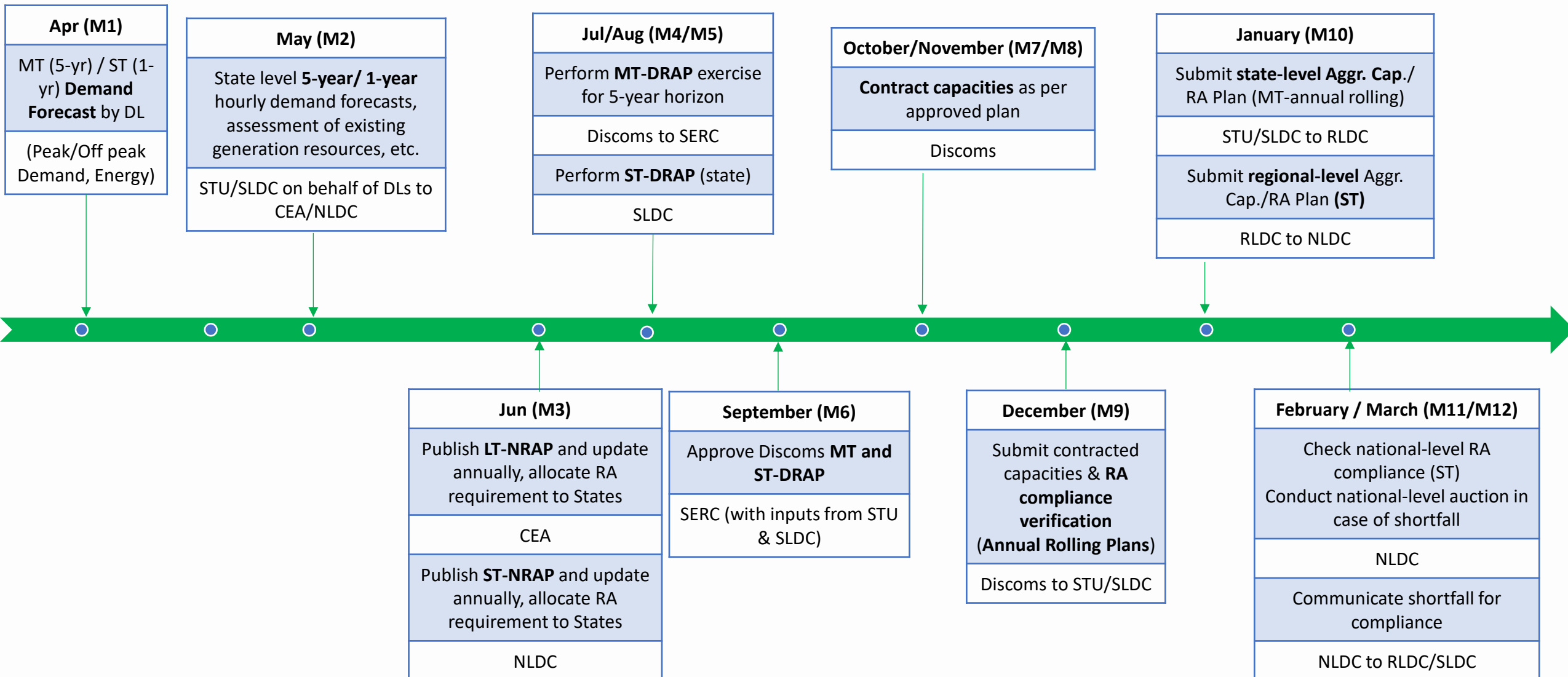
### Summary of Discussions:

- CEA guidelines have outlined process with timelines for the LT/ST RA plan development
- IEGC (Grid Code) has stipulated certain timelines for undertaking various activities by stakeholders for development of RA plan.
- FOR Model RA Regulations would provide overarching framework for guiding the RA process aligned with Grid Code (IEGC) and final RA Guidelines to be notified by CERC/CEA, respectively.
- Internationally, performance incentive and penalty structures differ from market to market.
- **Monitoring and Reporting:** Based on the MT-DRAP and ST-DRAP, STU and SLDC shall communicate the state-aggregated capacity shortfall to the State Commission by 30th September of each year for the ensuring year(s) and advise the distribution licensees to commit additional capacities.
- **Treatment for shortfall in RA Compliance:** Distribution licensees shall comply with the RA requirement and in case of non-compliance, appropriate non-compliance charge shall be applicable for the shortfall for RA compliance.



# 4: Monitoring and Compliance (2/2)

## FoR Recommendation



Parameters	FoR	Maharashtra	Karnataka	Tamil Nadu	Assam
Non-compliance for ST Shortfall	As decided by Commission	1.1 times Marginal Capacity Charge OR 1.25 times Average Capacity Charge which ever is greater	Marginal Capacity Charge OR 1.25 times Average Capacity Charge which ever is greater	1.1 times Marginal Capacity Charge OR 1.25 times Average Capacity Charge which ever is greater	1.1 times Marginal Capacity Charge OR 1.25 times Average Capacity Charge which ever is greater
Non-compliance for MT Shortfall	As decided by Commission	1.1 times Marginal Capacity Charge OR 1.25 times Average Capacity Charge which ever is greater	Marginal Capacity Charge OR 1.25 times Average Capacity Charge which ever is greater	1.1 times Marginal Capacity Charge OR 1.25 times Average Capacity Charge which ever is greater	1.1 times Marginal Capacity Charge OR 1.25 times Average Capacity Charge which ever is greater

**Most states have regulated non-compliance charges based on shortfall**

# Challenges and Way Forward

## Data requirement

- RA entails granular (hourly/sub-hourly) and extensive data compilation covering multiple years and comprehensive demand drivers for all consumer categories
- Timely data collection and recording can be a challenge
- Standard data templates for use & deployment by multiple planning agencies (CEA, POSOCO, STUs/SLDCs) can be put in place.

## Demand forecasting

- RA entails scientific and mathematical demand forecasting considering best fit methodologies and comprehensive input data, which is a big shift from the practice currently followed by most states and discoms
- Timely adoption of the new process and capacity building can be a challenge

## Optimization modelling

- RA entails application of energy modelling and optimization tools to identify optimal resource mix for meeting RA requirement
- Energy modelling is still an evolving field with not much experience & availability of resources amongst planning agencies incl. STU/SLDC
- Timely adoption of the new process and capacity building can be a challenge

## Synergy between multiple agencies

- By design, RA framework needs to optimise planning at national level and feed into state level planning
- CEA/NLDC would publish LT/ST-NRAP which would contain reliability metrics and allocation of RA requirement to state basis which state would allocate requirement down to discoms
- This requires interdependencies on data & timely actions across multiple agencies and Any slip ups could lead to sub-optimal results that would have undesirable consequences

## Timelines in initial years

- RA is a relatively new process and timelines esp. for the 1<sup>st</sup> year of implementation can be quite fast-paced, which can be a challenge while discoms and states still adopt to the process

## Non-compliance in initial years

- RA is a relatively new process and non-compliance charges for shortfall in initial years can be a challenge while discoms and states still adopt to the process
- Considering complexities, paradigm shift in planning & preparations required, utilities may be provided transition time or at least deferment of levvy of non-compliance charge in initial period.

## Miscellaneous

- Clarity on treatment of partial and full open access consumers
- Lack of clarity on capacity markets



# **Idam**

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By Idam

## **Contact:**

**Balawant Joshi**

**Ajit Pandit**

☎ +91 98214 21630

☎ +91 98211 08222

Email: [contact@idaminfra.com](mailto:contact@idaminfra.com)

## **MUMBAI**

Quest Coworks Pvt. Ltd., Technopolis Knowledge Park,  
5th Floor, Mahakali Caves Road, Chakala, Andheri East,  
Mumbai – 400 093

Phone: +91 22 6862 0300

## **PUNE**

1st Floor, Teerth Technospace,  
Mumbai-Bengaluru Highwar, Baner, Pune - 411 045

## **DELHI**

Awfis Space at Awfis, L29 - L34, 1st Floor, Connaught Place,  
New Delhi – 110 001

Phone: +91 22 6862 0300

## **KOLKATA**

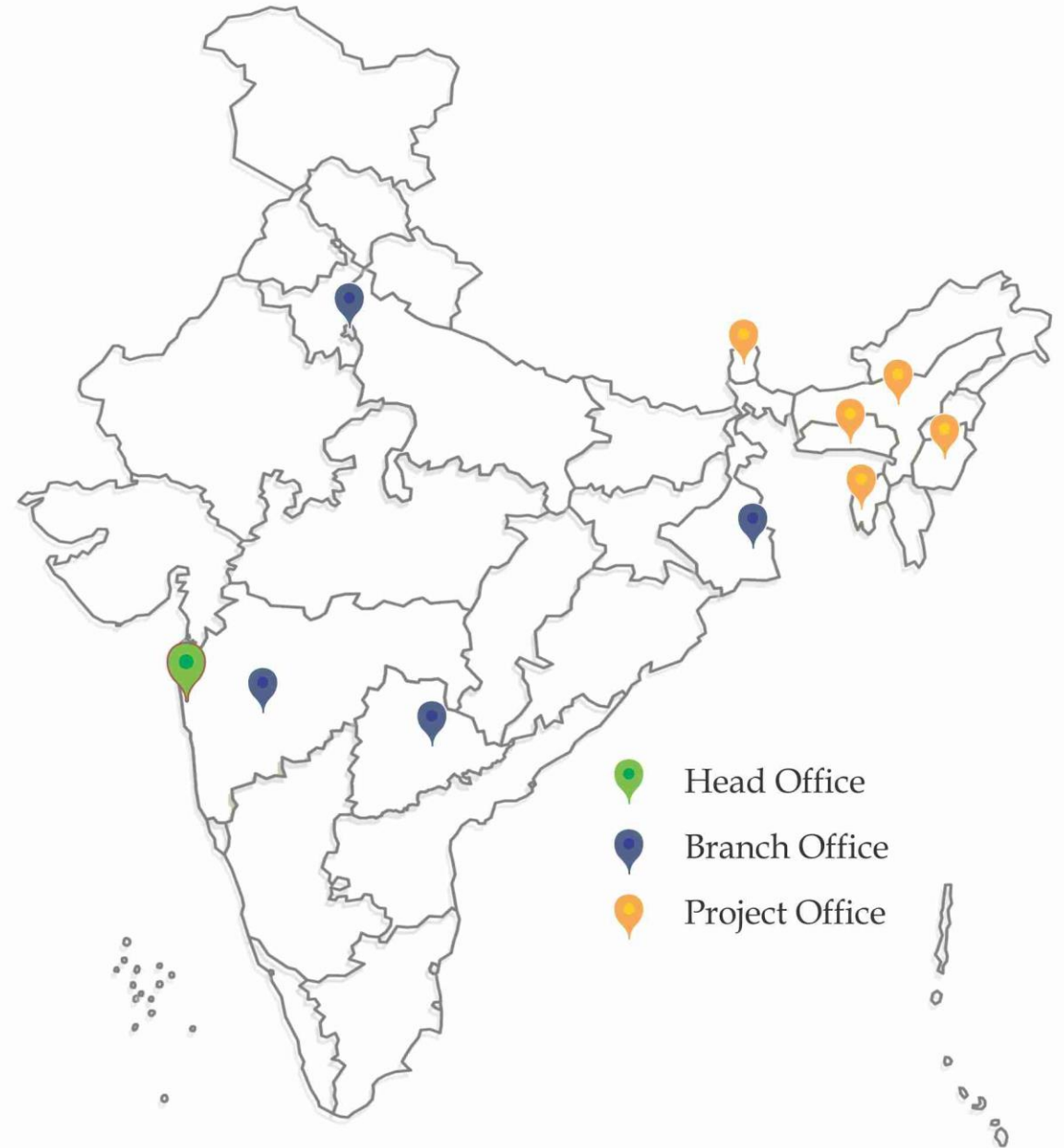
Awfis, Godrej Waterside, 12th Floor, Tower II, DP-5, DP Block,  
Sector V, Salt Lake, Kolkata - 700 091, West Bengal

Phone: +91 33 4604 8993

## **HYDERABAD**

House No. 3-51, Flat No. 201, Abhishek Towers,  
Balanagar, Hyderabad – 500 042

Phone: +91 91369 20664



-  Head Office
-  Branch Office
-  Project Office