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Workshop on

Renewable Energy Integration and Procurement

March 18 -19, 2024

South Asia Regional Energy Partnership (SAREP) and Sri Lanka Energy Program

Session 7: Power wheeling and how open access works with renewable energy projects

AGENDA

- Understanding of power wheeling & Open Access (OA)
- Business models associated with OA
- Tariff schemes related to OA and Green OA
- Tolling fees/ Wheeling charges schemes
- OA and wheeling regulations in India

The Open Access Phenomenon

- Open access is defined in the Electricity Act, 2003 as a non-discriminatory provision for the use of transmission line/ distribution systems by any licensee, consumer or a person engaged in generation in accordance with the regulations.

- This enables consumers to choose any supplier including a greener energy source and potentially benefit from cost savings.

- Open access can be beneficial for commercial and industrial (C&I) consumers who have high and predictable electricity demand

Motivation behind OA

- Consumers in India procure power from state electricity distribution companies (DISCOMs).

- The Electricity Act 2003, allowed consumers with a load requirement of one megawatt (MW) to buy electricity directly from power generators. Recently Rules for Green Energy allow 100 KW consumers to get OA.

- Act enables a favorable market through three power exchanges in India where consumers can get good electricity rates during different times of day.

Rise of OA

- The biggest beneficiaries and users were commercial and industrial (C&I) consumers because of their higherTariff and eligibility.

- In the past decade, the rise of renewable energy has also helped its OA market grow significantly and the Opening of a new Green Day Ahead market. Green Open Access Rules 2022 are believed to be a huge stepping stone towards achieving India's commitment to 500 GW of non-fossil fuel energy by 2030

- From around 300MW in 2009, the size of the renewable energy OA market grew to ~10GW as of fiscal year (FY) 2022

Northern Region

States	Generator	Consumer
Haryana	✓	✓
Punjab	✓	✓
Rajasthan	✓	✓
HP	✓	✓
J&K	✓	✗
Uttaranchal	✓	✓
Delhi	✓	✓
UP	✗	✗

Western Region

States	Generator	Consumer
M.P	✓	✓
DNH & DD	✗	✓
Gujarat	✓	✓
Chhattisgarh	✓	✓
Maharashtra	✓	✓

✓ **Allowed** ✗ **Not Allowed**

East & North Eastern Region

States	Generator	Consumer
Assam	✓	✓
Bihar	✗	✗
Manipur/Mizo	✓	✓
Tripura/Sikkim	✓	✓
Jharkhand	✗	✗
A.P.	✓	✓
Meghalaya	✓	✓
Orissa	✓	✓
West Bengal	✓	✗

Southern Region

States	Generator	Consumer
A.P	✓	✓
Karnataka	✓	✓
Tamil Nadu	✗	✓
Kerala	✗	✓

1. Business Models

Business Models associated with OA

Third-party power plants

Own - captive power plants

Power plants owned by a group of consumers, also known as group captive plants

Power Exchange market

Trading

When buying from third parties, C&I consumers typically sign power purchase contracts with clean energy developers wheeling electricity from their renewable's plants.

Third Party business model

- In this model, consumers purchase electricity from a renewable energy developer through a power purchase agreement (PPA).
- This is the most common model for open access in India, as it does not require consumers to make a large upfront investment.

Captive Power Plants Business model

- In this model, the consumer installs a renewable energy plant on their own premises, such as a rooftop solar system.
- This model is best suited for consumers with sufficient land and upfront capital

Group Captive Power Plants business model

- A group of consumers, such as industrial estates or businesses located in proximity, can come together to install a shared renewable energy plant.

- This model allows consumers to share the cost and benefits of renewable energy.

Power exchange market

Easy Access — Automated live trading system

Anonymous — Closed bidding environment

Transparent
- Demutualised, with oversight committees set by regulator.
- Standardised risk management, with regulatory oversight.
- Trade results made public

Reliable
- Disaster Recover site
- Established C&S, with no defaults till date

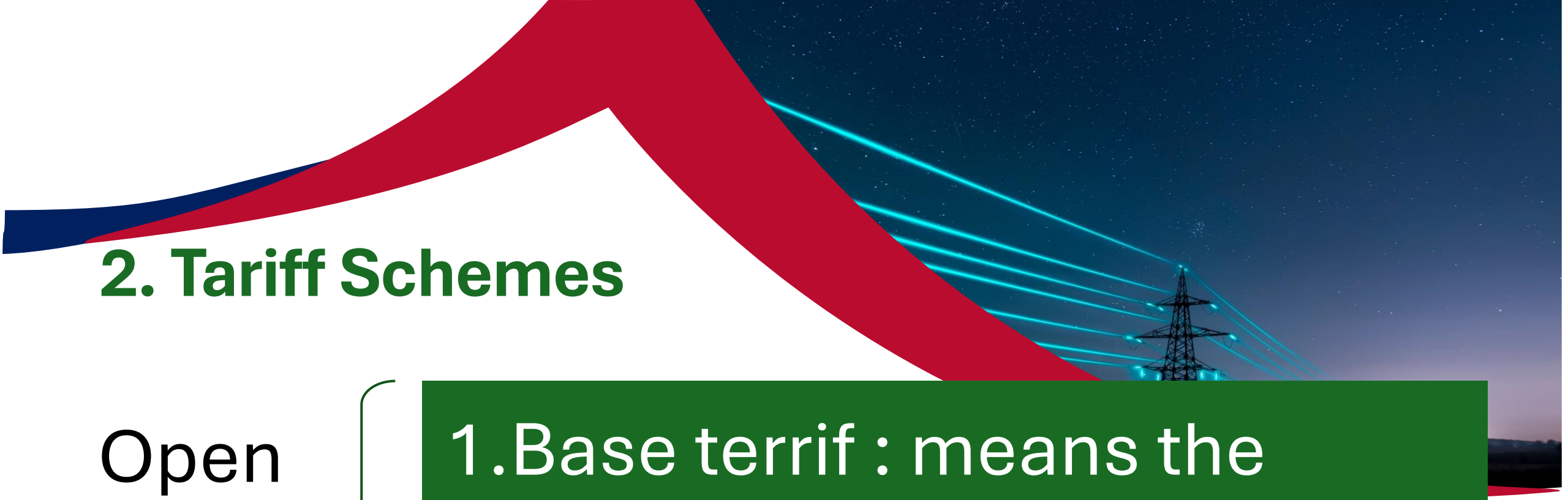
Secure
- Terminals connected through MPLS and SSL only.
- Surveillance room with necessary security (Separate network, Restricted biometric access, Video & Audio recording).
- Periodic IT system audit for data security, data integrity and operational efficiency. Automated audit trail

Benefits of power market exchange

Price Transparency	• Ability to know the price of electricity in the market
Risk Management	• Manage price/ delivery risk • Secure and Regulated market
Guaranteed performance of trades	• Credit tracking mechanism • Default Mitigation mechanism
Lower Transaction Cost	
Flexibility	• Term of delivery • Time of Closure
Access to a wider/ larger market spectrum	

Successful Model

- The group captive model is currently the preferred option for OA procurement in India as CSS and AS are waived under this model, per the Electricity Act 2003.
- Depending upon the tariff structure the open access is preferred in different times of day through exchange
- Efforts by C&I consumers to lower electricity costs and meet sustainability goals are driving their uptake of renewable energy.

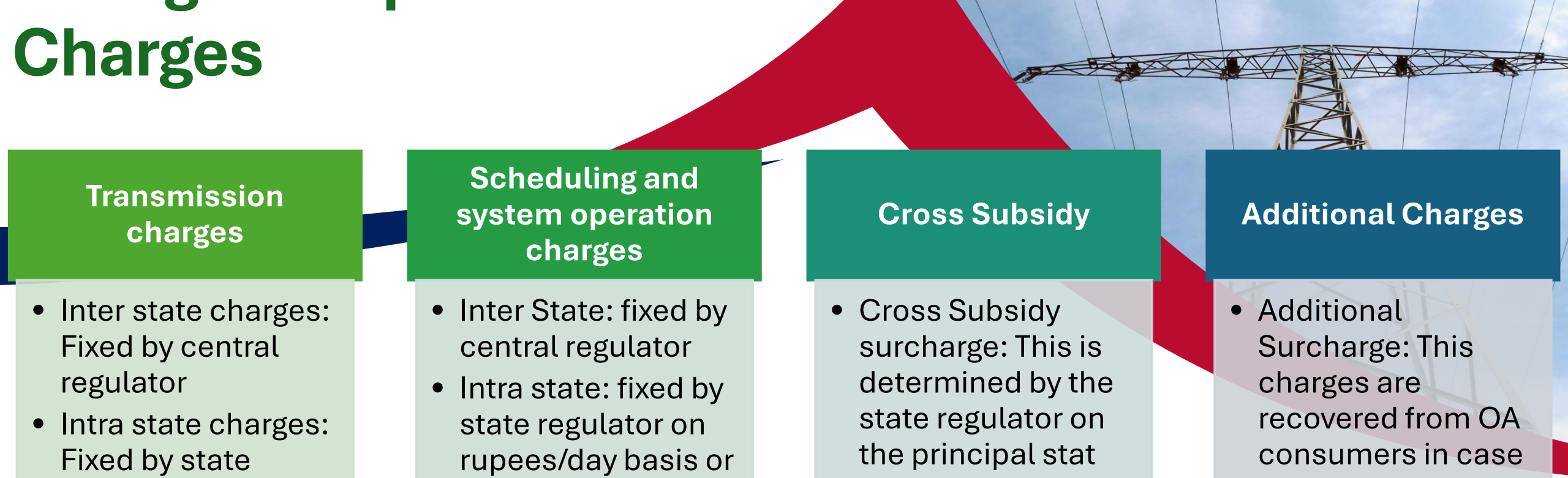


2. Tariff Schemes

Open Access landed cost

1. Base terrif : means the power purchase charge from generating Companies plus
2. Open access charge

Charges



Transmission charges

- Inter state charges: Fixed by central regulator
- Intra state charges: Fixed by state regulator
- Charges are either in MW/Day Basis or MWH/unit Basis depending upon duration of the contract

Scheduling and system operation charges

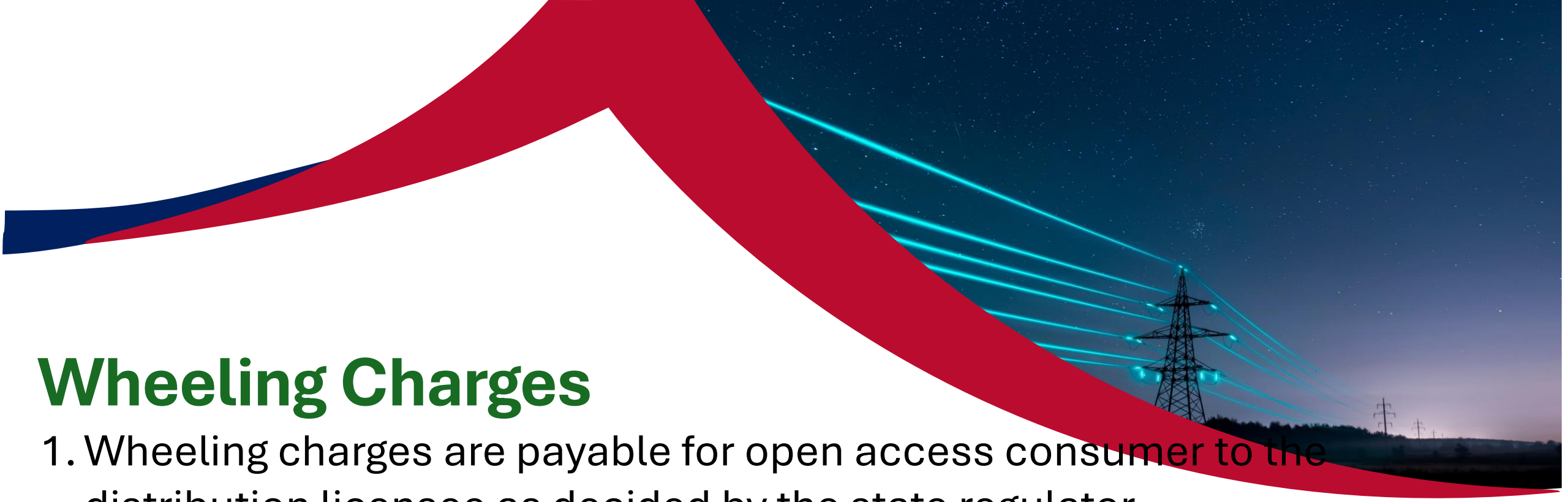
- Inter State: fixed by central regulator
- Intra state: fixed by state regulator on rupees/day basis or rupees/ month or per year basis
- Banking Charges

Cross Subsidy

- Cross Subsidy surcharge: This is determined by the state regulator on the principal stat out on the tariff policy and respective regulations. It is exempted for captive and group captive in India

Additional Charges

- Additional Surcharge: This charges are recovered from OA consumers in case of surplus power and are taken on per unit basis depending upon the term of the duration of the contract
- Losses



Wheeling Charges

1. Wheeling charges are payable for open access consumer to the distribution licensee as decided by the state regulator
2. The Electricity (Promoting Renewable Energy Through Green Energy Open Access) Amendment Rules, 2023 standardized wheeling charges and charges for banking across states, making open access more attractive.

2. OA Application Procedure

Nodal Agency:

- In most States, STUs handle LTOA (Long-Term Open Access) and MTOA (Medium-Term Open Access), while SLDCs manage STOA (Short-Term Open Access).
- Maharashtra and Chhattisgarh have their State Discoms as the nodal agencies. Even when SLDCs oversee the process, they operate as part of the STU.

Required Documents:

- Acquiring an NOC from State utilities is the main challenge in securing open access approvals.
- In Chhattisgarh, Gujarat, Tamil Nadu, and Jharkhand, you need an NOC along with your open-access application, potentially causing delays and complications before submission.

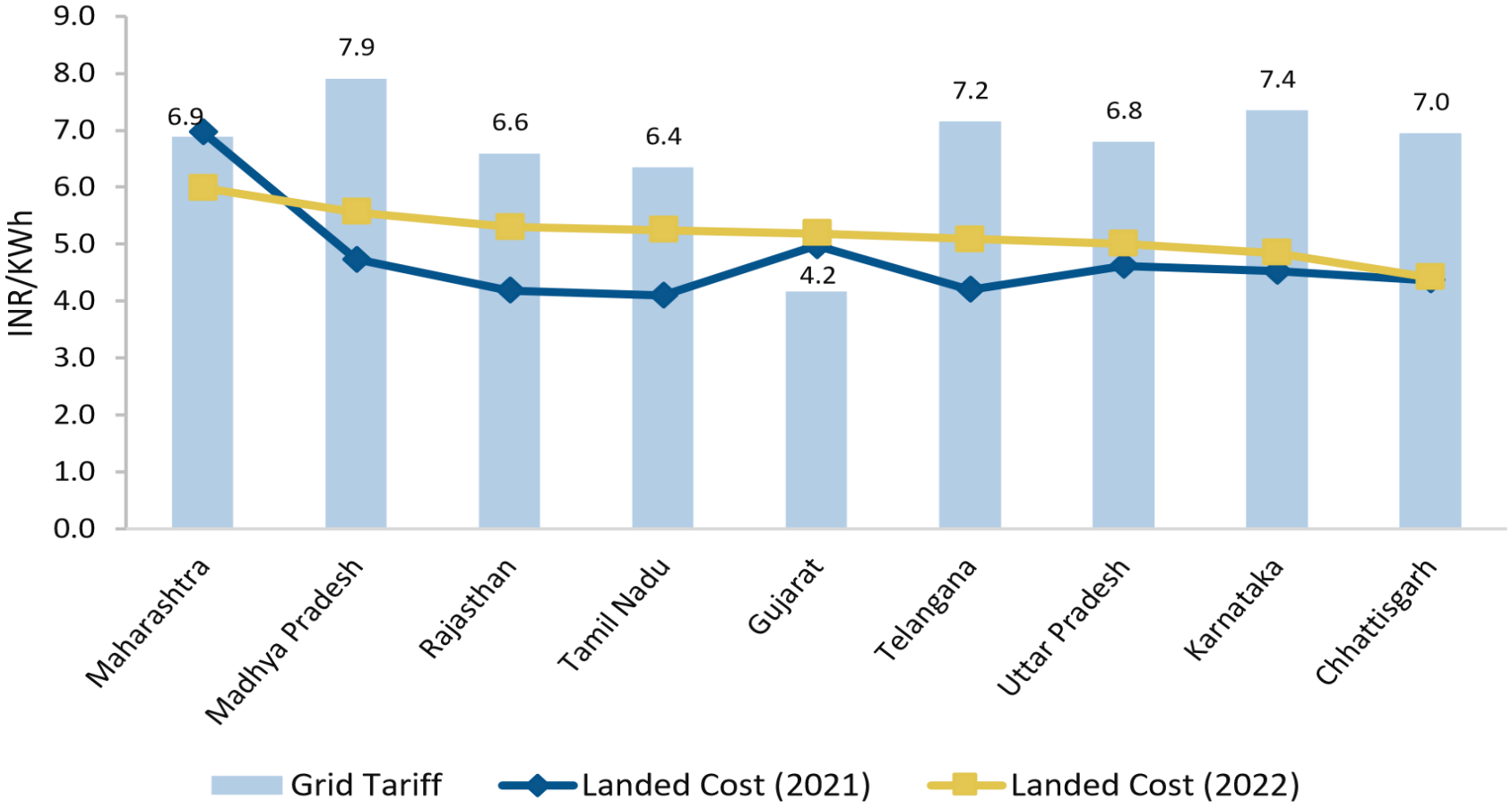
Application Processing Time:

- The processing time for open-access applications varies significantly from state to state.
- In Andhra Pradesh, LTOA applications are deemed approved within 30 days.

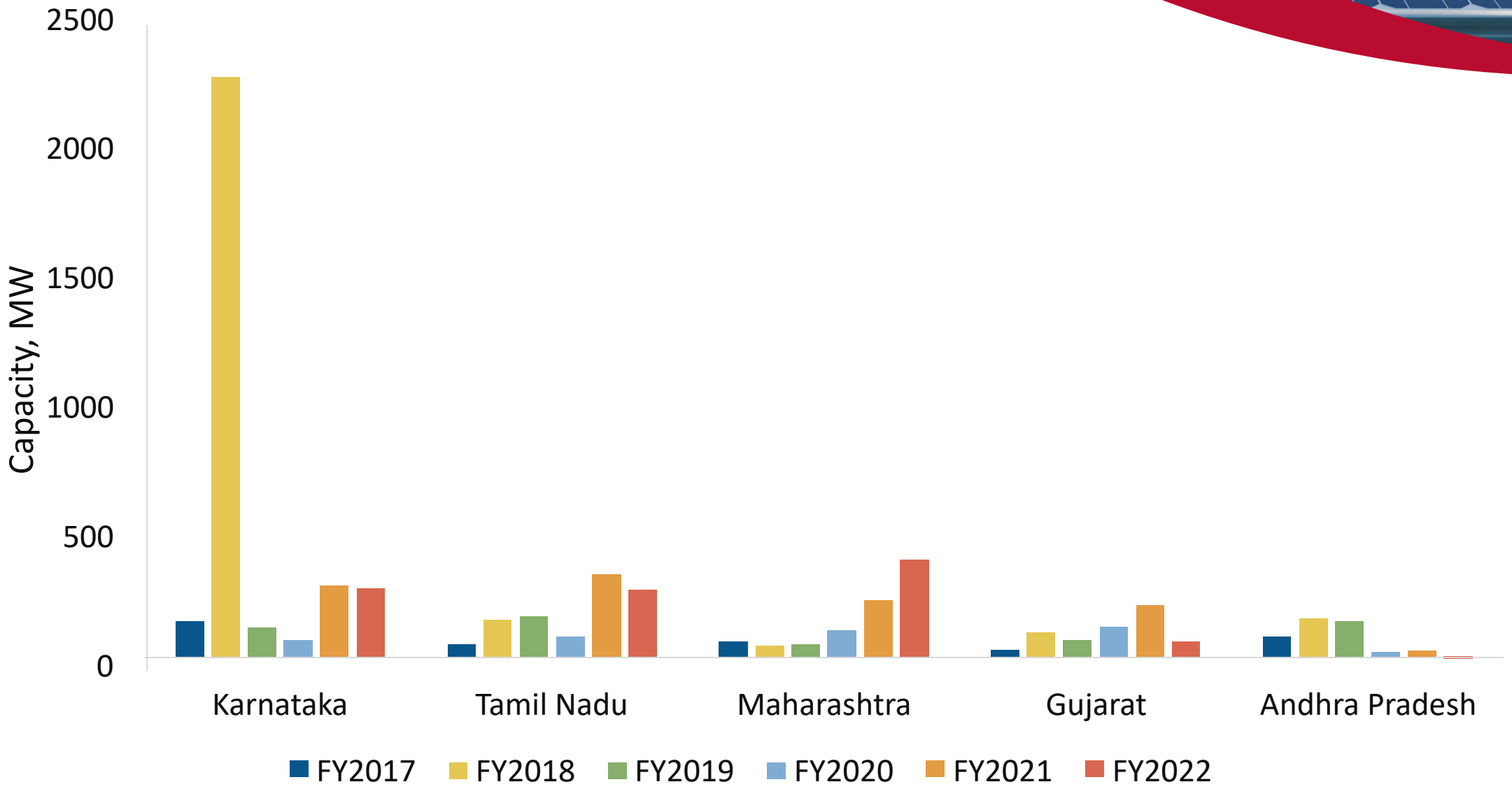
Application Cost:

- The application fee structure for open-access applications differs based on the state, application period, load, connection point, and power source.
- Although the application fee varies widely across states, the cost per unit is generally minimal.

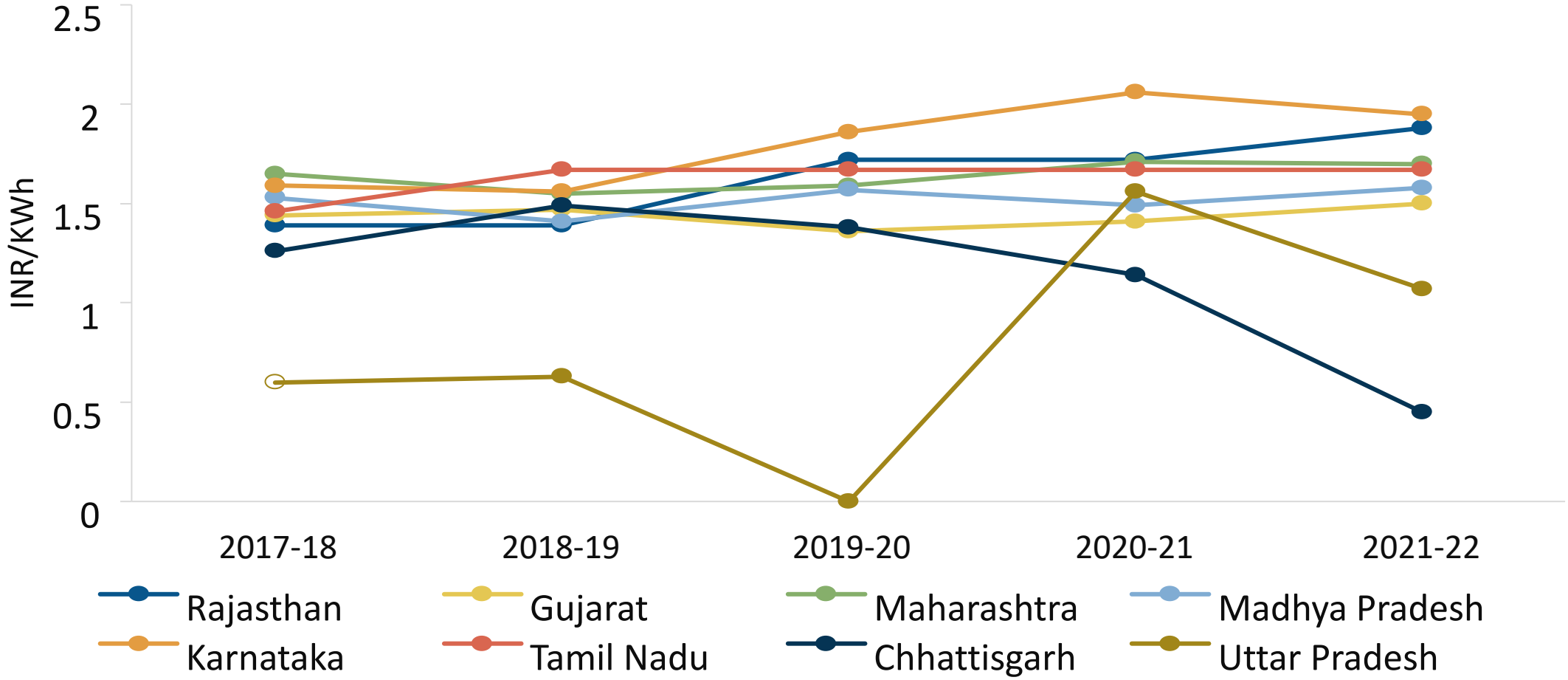
Group Captive-OA Landed cost



Top 5 States in RE Open Access Market



Comparison of Cross Subsidy Surcharge

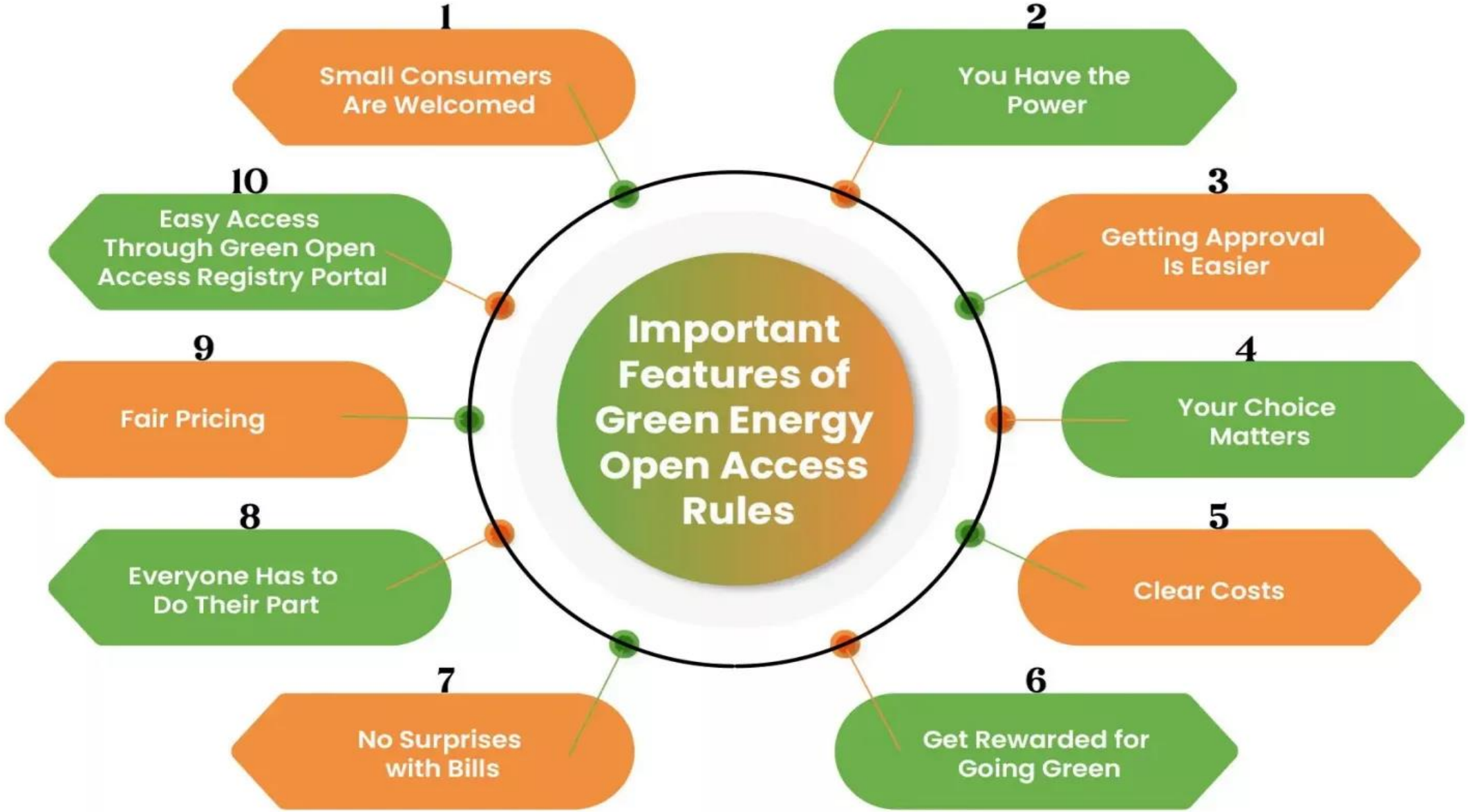


OA Policy & Regulations

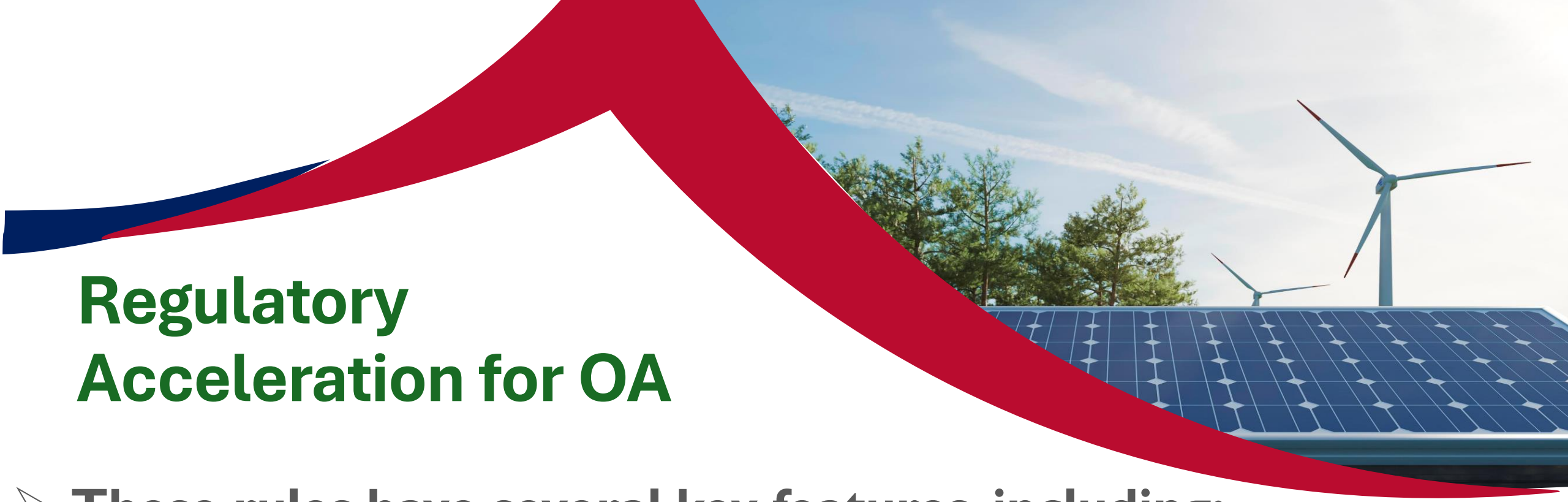
The Electricity Act, 2003, provides the legal framework for open access in India.

The Green Open Access Rules, 2022, were notified by the Ministry of Power to further promote open access for renewable energy.

- These rules aim to promote open access for renewable energy sources like solar and wind power.


Important Features of Green Energy Open Access Rules
1
Small Consumers Are Welcomed
2
You Have the Power
3
Getting Approval Is Easier
4
Your Choice Matters
5
Clear Costs
6
Get Rewarded for Going Green
7
No Surprises with Bills
8
Everyone Has to Do Their Part
9
Fair Pricing
10
Easy Access Through Green Open Access Registry Portal

	Details
OA Eligibility	• Any consumer having contract demand/sanctioned load ≥ 100 kilow • No capacity limit for captive consumers.
Nodal Agency	• A central nodal agency to be set up to maintain a centralised public for all green OA consumers. • All OA applications after getting registered in the centralised registry routed to the concerned nodal agency. • Concerned Nodal Agency: ○ Short-Term OA: Load Dispatch Centre Medium-Term OA: State Transmission Utility (STU) ○ L Central Transmission Utility (CTU)
OA Charges	• Only six kinds of OA charges have been specified: a) Transmission Charges b) Wheeling Charges c) Cross Subsidy Surcharge (CSS) d) Standby Charges e) Additional Surcharg f) Banking Charge • AS is not applicable on renewable energy OA if the consumer alread charges. • CSS and AS do not apply to Waste-to-Energy plants. • CSS on a C&I consumer will not increase by more than 50% during 1 from the "commercial operation date" of the OA plant.
OA Grant Procedure	• All OA applications to be submitted on a centralised OA portal. • **Approval window of OA applications by concerned nodal agency: 1** • OA applications priority: Long-Term > Medium-Term > Short-Term
Banking	• **Minimum banking settlement period: monthly** • Minimum banking allowed (as % of energy consumption): 30%
Green Energy Tariff	• DISCOM obliged to supply green energy upon request by a consume of an additional charge — Green Energy Tariff. • Any such requisition from the consumer shall be for a minimum peri year. • Renewable energy consumed by a consumer in excess of its RPO obl counted towards RPO compliance of DISCOM.
Green Energy Rating	• Consumers will be rated based on the percentage of renewable ene
Green Hydrogen/Ammonia	• Green hydrogen/ammonia purchase to be counted towards RPO ful • CSS and AS are not applicable on renewable energy utilised for prod hydrogen/ammonia.



Regulatory Acceleration for OA

- **These rules have several key features, including:**
  - **These rules are notified for promoting generation, purchase and consumption of green energy including the energy from Waste-to-Energy plants.**
  - **The Green Open Access is allowed to any consumer and the limit of Open Access Transaction has been reduced from 1 MW to 100 kW for green energy, to enable small consumers also to purchase renewable power through open access.**

Key highlights of the Green Energy OA Rules :

Swift Approval Process:

The nodal agency responsible for managing open access applications is required to approve these requests within a short time frame of fifteen days. This speedy approval process ensures that consumers can swiftly transition to green energy sources without unnecessary delays.

Eligibility Criteria:

To qualify for Green Energy Open Access, consumers must have a contracted demand or sanctioned load of a hundred kW and above. This threshold ensures that those with substantial power requirements can take advantage of green energy options.

No Supply Limit For Captive Consumers:

Captive consumers, those who generate and consume their power, face no limitations on the supply of power when utilizing Green Energy Open Access. This encourages self-sufficiency and reduces the burden on traditional power grids.

Balancing High Variations in Demand:

To maintain grid stability and avoid sudden fluctuations in demand, reasonable conditions, such as limiting the number of time blocks for changing power consumption, may be imposed. These conditions help ensure a smooth transition to green energy sources without disrupting the power supply.

Features of Gujarat Green energy rules

- Consumers are entitled to demand supply of Green Power from Discoms at additional premium charges. Discoms would be obligated to procure and supply green power to eligible consumers.
- These Rules will also streamline the overall approval process for granting open access. Time bound processing by bringing uniformity and transparency in the application as well as approval of open access through a national portal has been mandated. Approval for Green Open Access is to be granted in 15 days or else it will be deemed to have been granted.
- Commercial and Industrial consumers are allowed to purchase green power on voluntarily basis.

Features of Gujarat Green energy rules

- Provide certainty on open access charges to be levied on Green Energy Open Access Consumers which includes transmission charges, wheeling charges, cross-subsidy surcharge and standby charges. Cap on increasing of cross-subsidy surcharge as well as the removal of additional surcharge, incentivize the consumers to go green.

- There shall be a uniform Renewable Purchase Obligation (RPO), on all obligated entities in area of a distribution licensees. Green Hydrogen/Green Ammonia has also been included for fulfilment of its RPO.

Features of Gujarat Green energy rules

- Consumer can use banking within 30 days of period.
- Consumers will be given Green Certificates if they consume green power.
- ISTS are waiver for green energy generators including pumped storage and battery storage till 2025 for 25 years.
- However, for Green hydrogen waiver timeline for 8 year provided they use green energy including battery storage for production of Hydrogen

ISTS Transmission Charges and Losses Waiver for Projects Commissioned Before 30 June 2025

Energy Source	Waiver (ISTS charges)	Waiver (ISTS losses)	Remarks
Solar		✗	• Waivers Timeline: 25 years from the date of commissioning (DOC)
Wind		✗	
Pumped Storage Plant (PSP)		✗	• Waivers Timeline: 25 years from DOC Waivers Eligibility: 51% of charging • energy from Wind/Solar.
Battery Energy Storage System (BESS)		✗	• Waivers Timeline: 12 years from DOC Waivers Eligibility: 51% of charging • energy from Wind/Solar.
GTAM/GDAM		✗	• Waivers Eligibility: Only for trading energy from solar/wind/PSP/BESS.
Green Hydrogen		✗	• Waivers Timeline: 8 years from DOC Waivers Eligibility: Production using • solar/wind/PSP/BESS energy sources
Any of the Above (Bidding before 15 January 2021)			• Waivers Eligibility: Bidding of the project completed before 15 January 2021

Thank You & Open for discussion

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