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# Regulatory considerations in Smart Grid in India

Partnership to Advance Clean Energy-Deployment (PACE-D)  
Technical Assistance Program

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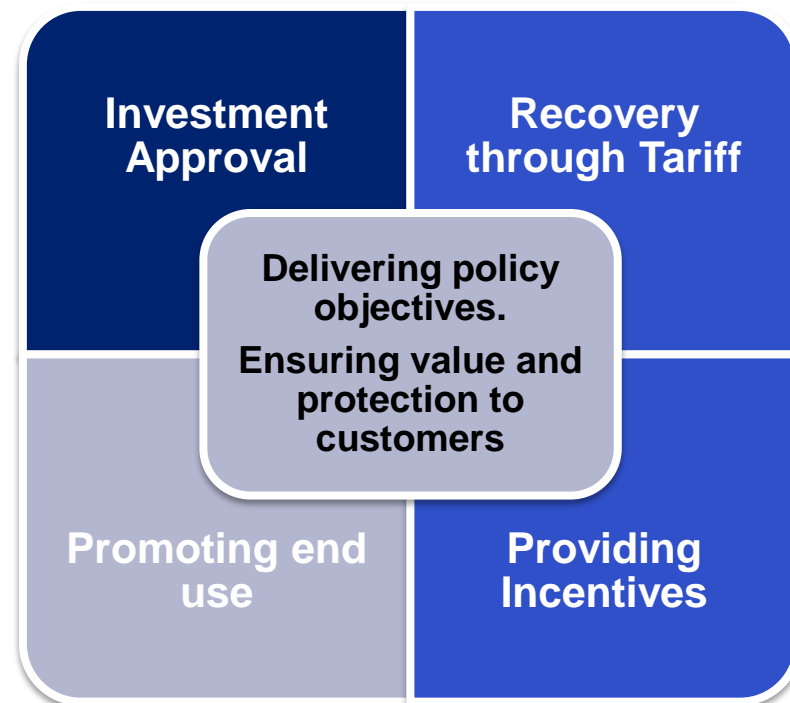


# Contents

- **Context for Smart Grid Regulations**
- **Work undertaken under the PACE-D TA Program**
- **Objective, Scope and Coverage of Smart Grid Regulations**
- **Way Forward**

## Context of Smart Grid Regulations

- Smart Grids cannot evolve without dynamic, flexible regulation
- The regulator will be a facilitator to smart grids business
- Discoms need to demonstrate clear positive benefits to consumers
- Regulators more than ever need to protect the interests of the consumers





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## Technical Committee for Development of SG Regulations

- **Constituted by the Ministry of Power**

- Mr. B N Sharma, Joint Secretary (Distribution), MoP (Chairman)
- Mr. Pravinbhai Patel, Member (Technical), GERC
- Mr. Alok Gupta, Member, MPERC
- Mr. Pankaj Batra, Chief Engineer, I/C, CEA
- Mr. S A Soman, Professor, IIT-Mumbai
- Mr. N. S. Sodha, Executive Director, PGCIL Ltd. (Convenor)

- **Role of Committee**

- To provide technical expertise and advice to the PACE-D TA program team during the development of regulations
- To review the draft documents and help in the formulation of the regulations which will be finally submitted to the Forum of Regulators (FOR) for its consideration



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## Objective of Smart Grid Regulations

1

- Efficiency in generation and licensee operations
- Manage T&D network effectively
- Enhance network security
- Integrate renewable and clean energy into the grid
- Enhance network visibility and access
- Improve customer / prosumer service level

**By greater technology adoption** across the value chain in electricity sector (especially in T&D)

2

Takes into consonance the National & State Roadmaps, and aims to **propagate investments in SG and allied technologies in accordance with these roadmaps**

3

Considering early stages of development, provides **flexibility** to experiment with new technologies and applications while duly protecting the legitimate **interests of consumers and prosumers**



1

Approval of Smart Grids **investments** consistent with the objectives

2

**Tariff design** for enabling consumers, prosumers and utilities to derive benefits of the SG investments

3

**Incentive/dis-incentive** design for promoting deployment

## Scope of Smart Grid Regulations

4

Protection of **consumer privacy**, maintaining integrity of data

5

Adoption of relevant equipment, **communication standards** and codes and **interoperability**

6

Security of network operations, particularly respect of **cyber security**

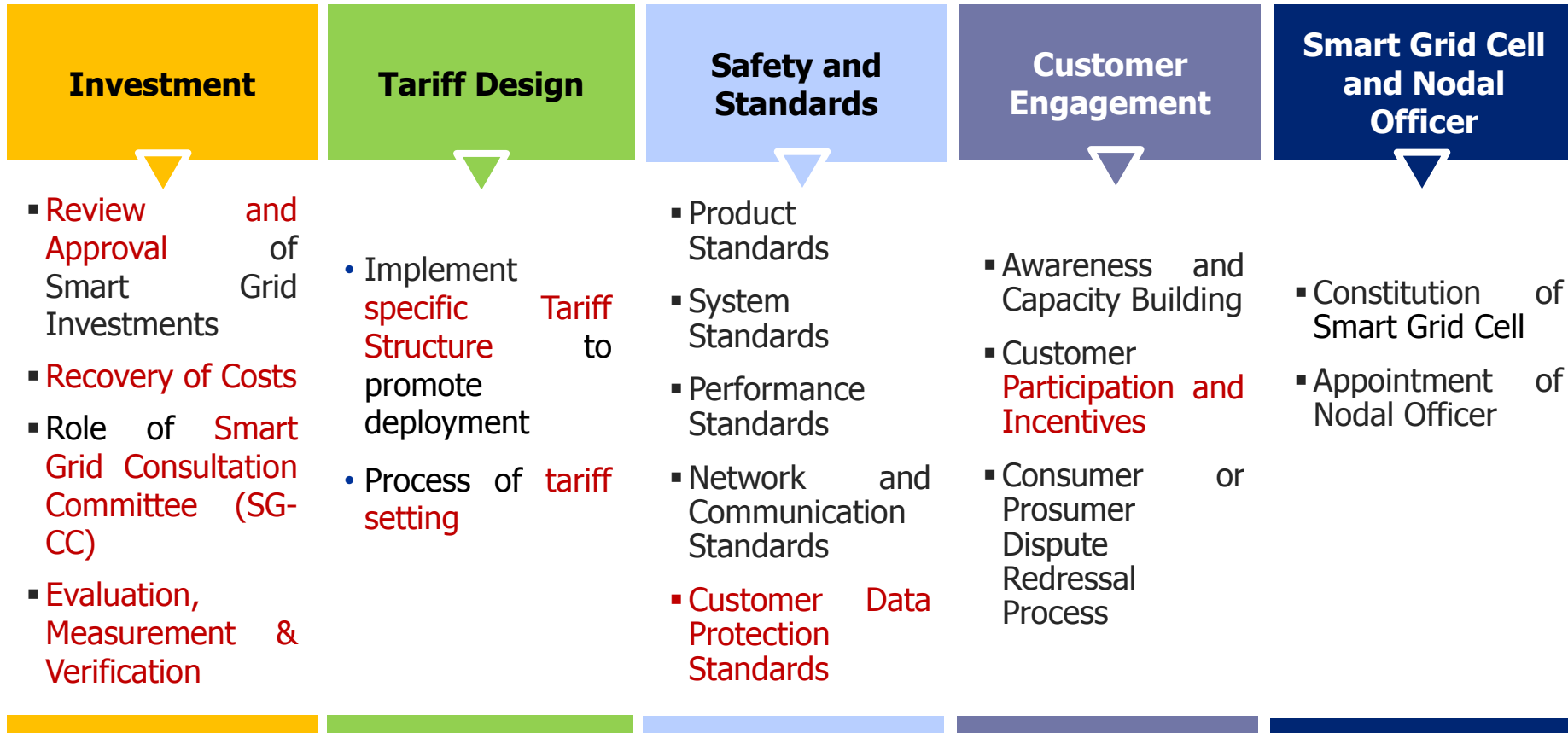
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**Integration of Renewable/Distributed Generation** for better visibility and efficiency

Entities may be required to demonstrate adherence to the requirements stipulated herein through appropriate reporting structures (preferred through automated means with minimum human intervention)



# Smart Grid Regulations Coverage



**While the regulations provides details of various themes, in certain cases it interfaces with the developments/standards and process already laid out in various documents**



## Investments

## Tariff Design

## Safety and Standards

## Customer Engagement

## Smart Grid Cell & Nodal Officer

### Review and Approval of Smart Grid Investments

- Approval of SG projects above a specified value
- Investments plan may be aligned to the MYT cycle
- Aligned with the state and national SG roadmap
- CBA to be undertake for all stakeholders involved/affected
- Project plan to include training and customer engagement

### Smart Grid Consultation Committee (SG-CC)

- To be appointed by the Commission
- Assist the SERC SG project/plan evaluation
- Undertake or direct research and analysis specific aspects
- Creation of SG-CC Fund through the licensee annual fees

### Recovery of Cost

- ARR determination process (**Socialization**)
- Specific tariff schemes (**Recovery from specific consumer segment**)
- Surcharges

### Evaluation, Measurement and Verification (EM&V)

- All utilities to be evaluated and guided by EM&V framework



## Design of Tariff Structures for Smart Grids Programs

Implement specific tariff regimes for Smart grids projects:

Time of Use (TOU) Tariff	Critical Peak Pricing (CPP)	Real-Time Pricing (RTP) Tariffs	Variant and Combination Tariff
<p>Customer pays a higher amount of money <b>(on-peak prices)</b> for the peak hours during the day and lower <b>(off-peak)</b> prices during the night</p>	<p>Customers pays <b>significantly high prices</b> under predetermined trigger conditions. This type of rate is an additive one and can be combined with any other (usually TOU) tariff.</p>	<p>Consumption is charged <b>on an hourly or half-hourly or fifteen minute basis and mirror wholesale prices/cost trends</b> to the customers.</p>	<p>Variant and combination of tariffs considering the purpose, the benefits envisaged, technology considerations and consumer protection needs</p>

Investments

**Tariff Design**

Safety and  
Standards

Customer  
Engagement

Smart Grid Cell  
and Nodal  
Officer

## Guiding Principle in Design of Tariff Structures for Smart Grids Programs

Tariffs to be **simple, understandable, financially rewarding for consumer**, and ensure that the impact and benefits for the licensees and consumers/prosumers are apparent.

Notify **suitable Distributed Generation (DG) Tariffs for prosumers** selling electricity from the DG facilities to the grid.

Reflect **suitable incentives and dis-incentives for consumers participating in the tariff programs** based on the level of adherence *(for programs related to Demand response or those that involve consumer or prosumer participation)*

**Provision for R&D activities** in the field for Smart Grid projects, to be recovered through ARR- Transco, Discom and Load Despatch



## Safety and Standards Related to Smart Grids

Product	System	Network and Communication
<p>Where available BIS standards to be complied with for all equipment and technology related to smart grids.</p>	<p>BIS/CEA standards to be complied with for all system and network operational matters. E.g. IEGC, Metering Standards, Technical Standards on Grid Connectivity</p>	<p>Related to interoperability and cyber security are in place by either BIS or CEA then they shall be adopted.</p>

**Where standards by relevant nodal entity are not available , those notified by IEC/IEEE/ANSI Standard may apply**

**Commission may require certificate of compliance from the designated nodal agency**



Investments

Tariff Design

**Safety and Standards**

Customer Engagement

Smart Grid Cell and Nodal Officer

## Safety and Standards Related to Smart Grids

### Performance Standards

- **SOP regulations to be applicable for assessing the performance** of the SG projects and for incentivizing / penalizing performance of licensees
- May specify and **require implementation of additional SOPs** to maximize the benefits and ensure compliance
- All SoPs to be met shall be **measurable through measurement, visualization and analytics facilities**

### Customer Data Protection

- **Ensure protection of consumer privacy** as the highest levels of priority. Specify **rules for customer privacy & data protection** that licensee shall be obliged to follow
- Commission may allow licensees to disclose consumption data to third parties,
- **No entity shall be permitted to sell/disseminate** consumer data to any party or use for other purposes
- **Consumers shall have access to all of their own consumption data**
- Disputes to be resolved through Consumer Grievance Redressal Forum & Electricity Ombudsman



## Customer Engagement and Smart Grids

### 1 Awareness and Capacity Building

- Earmark up to [XX%] of the project cost for each smart grids project towards consumer awareness & capacity building
- Define a clear internal & external communication strategy that identifies the communication needs linked to the key project components

### 2 Customer Participation & Incentives

- Consumers to be permitted to opt in or out of the programs
- May approve proposals for incentives/dis-incentives to participating consumers
- Full details of the program rebates, incentives and penalties to be available on the Licensee's website
- Review schemes on the basis of consumer/prosumer and utility feedback

### 3 Consumer or Prosumer Dispute Redressal Process

- Disputes resolution through the CGRF & office of the Electricity Ombudsman, as relevant.
- Time to time review and modify relevant regulations on Consumer Grievance Redressal to ensure effective implementation of the Smart Grids program



Investments

Tariff Design

Safety and Standards

Customer Engagement

**Smart Grid Cell and Nodal Officer**

## Constitution of Smart Grid Cell and Appointment of Nodal Officer

May require **Licensees to constitute a Smart grids Cell** responsible for coordinating activities related to defining and implementing approved SG roadmap and pilots

Upon its constitution, Licensee to appoint a **nodal officer** for heading the operations of such cell

## SG Cell functions:

- Development of the overall SG program and the identification of specific plans
- Develop quality DPRs in line with program requirement, roadmaps and other regulations and codes
- Record information on the progress & performance over time and report back to the Commission
- Report to the Commission on the SOPs achieved against the notified benchmarks

**Licensee may combine activities related to energy efficiency, DSM and SG implementation within the same cell**

***Absence of a Smart Grids Cell shall not limit the implementation of the Smart Grids projects by the Licensee***



## Assessment of Performance of Smart Grid Projects & Programs

1

### Performance Measurement through KPI

- Define **Key Performance Indicators (KPIs) and their measurement criteria** and the process for monitoring and reporting.
- For each KPI there shall also be a methodology for measuring and verifying the performance approved by all stakeholders.

2

### Project Monitoring and Progress Reporting

- Monitoring to include **methods for identifying and resolving project issues and disputes**
- **Project progress reports** to be submitted to the Commission as per periods specified through orders
- After the completion of each project, a completion report to be submitted to the Commission within 3 months of project completion.



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## Way Forward

- Draft Regulations and EM shall be submitted to Forum for its consideration by the Technical Committee
- FOR to take forward the process of finalization of regulations through appropriate consultation process
- With finalization of the model regulations, the states to adopt/adapt these regulations in their respective states



**Thank You**