Session 3
RE and EV Integration in Distribution Grid

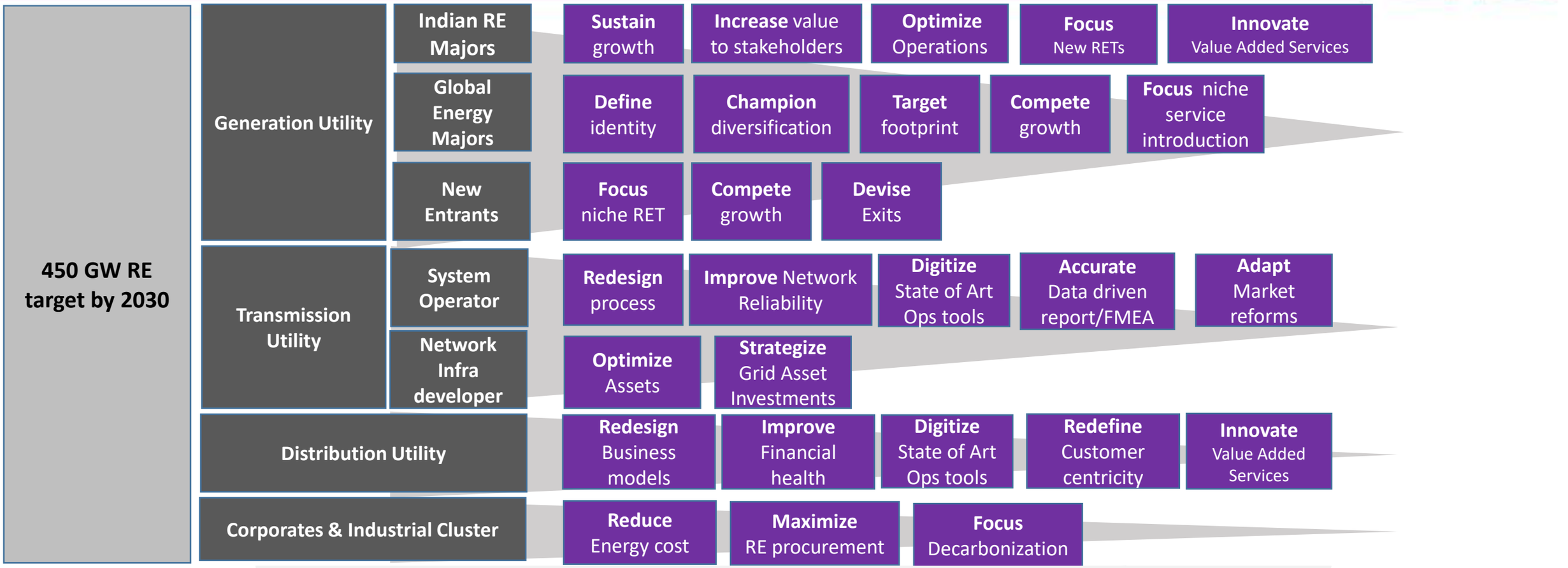
Presented by

Anurag Johri,

MD and Lead Utilities,

Accenture

With increasing share of RE Technologies (RET) in Indian Power system, Utilities begin focus on Operational Efficiency, System Reliability and Business Excellence



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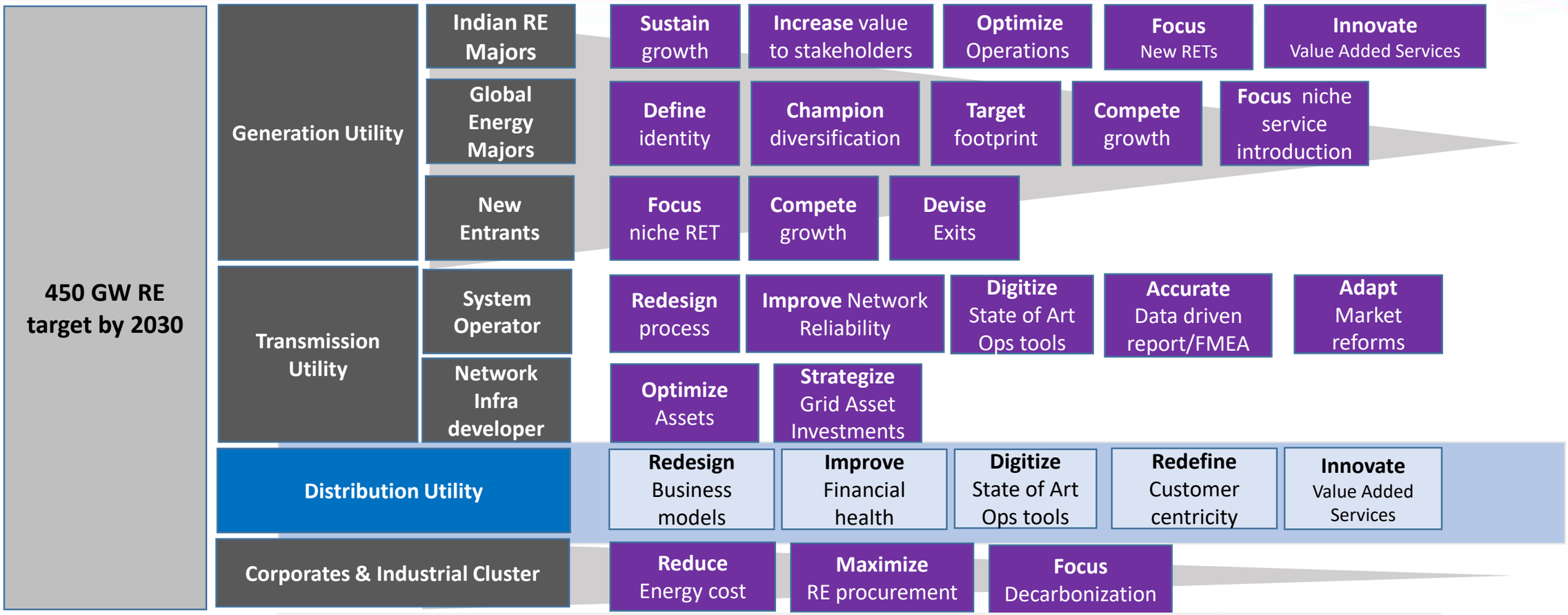


Power Utilities must manage risks to incumbent assets and optimize growth opportunities

Consumers focus to adapt to changing landscape cost effectively

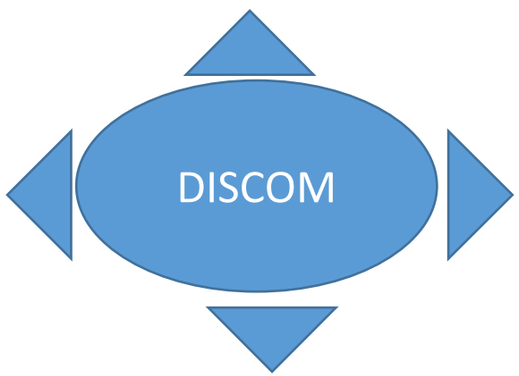
Key trends and disruptions observed in Distribution Utilities

New DER sources into grid

- RTS increase in consumer segments esp. C&I, Resi and SME
- BESS witnessing attracting C&I deployment opportunities
- Aggressive plans to Ramp up EV sales from 0.5 Mn in FY20 to 100Mn in FY30
- EV charging infra deployment plans at high

Grid management Trends

- Increase in short term market trades
- Increase in cost in PX markets
- Challenging price economics to peak load management
- Management of BTM sources



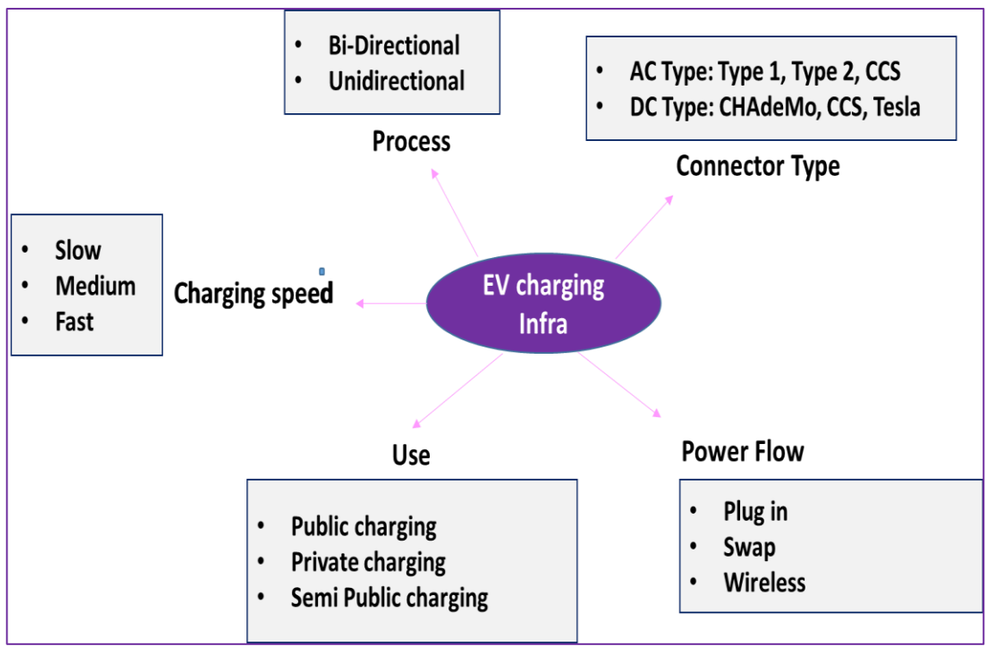
Consumer trends

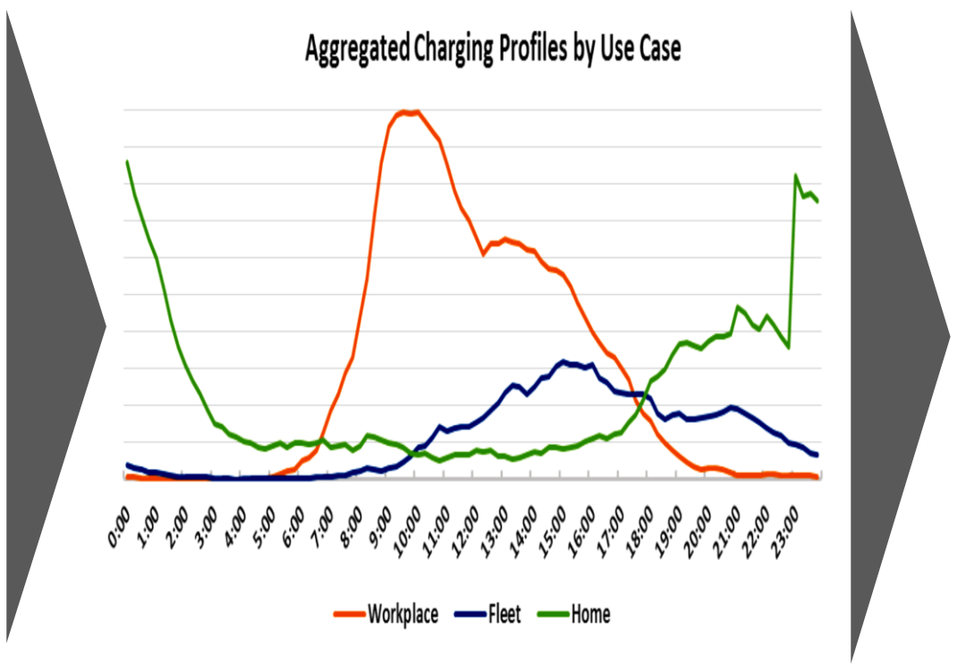
- % Consumers transitioning to Prosumers
- Increase in RE 100 consumers
- Consumers demand better utility service

Utility Process Improvements

- Smart meter deployments
- Grid infra upgradation
- DSM, P2P and DR program pilots
- Fiscal health reform programs
- New Business model to manage RTS

Illustrative EV charging Infra Vs Aggregated Charging Profile -
Energy Use Profiles Depends on Use Case



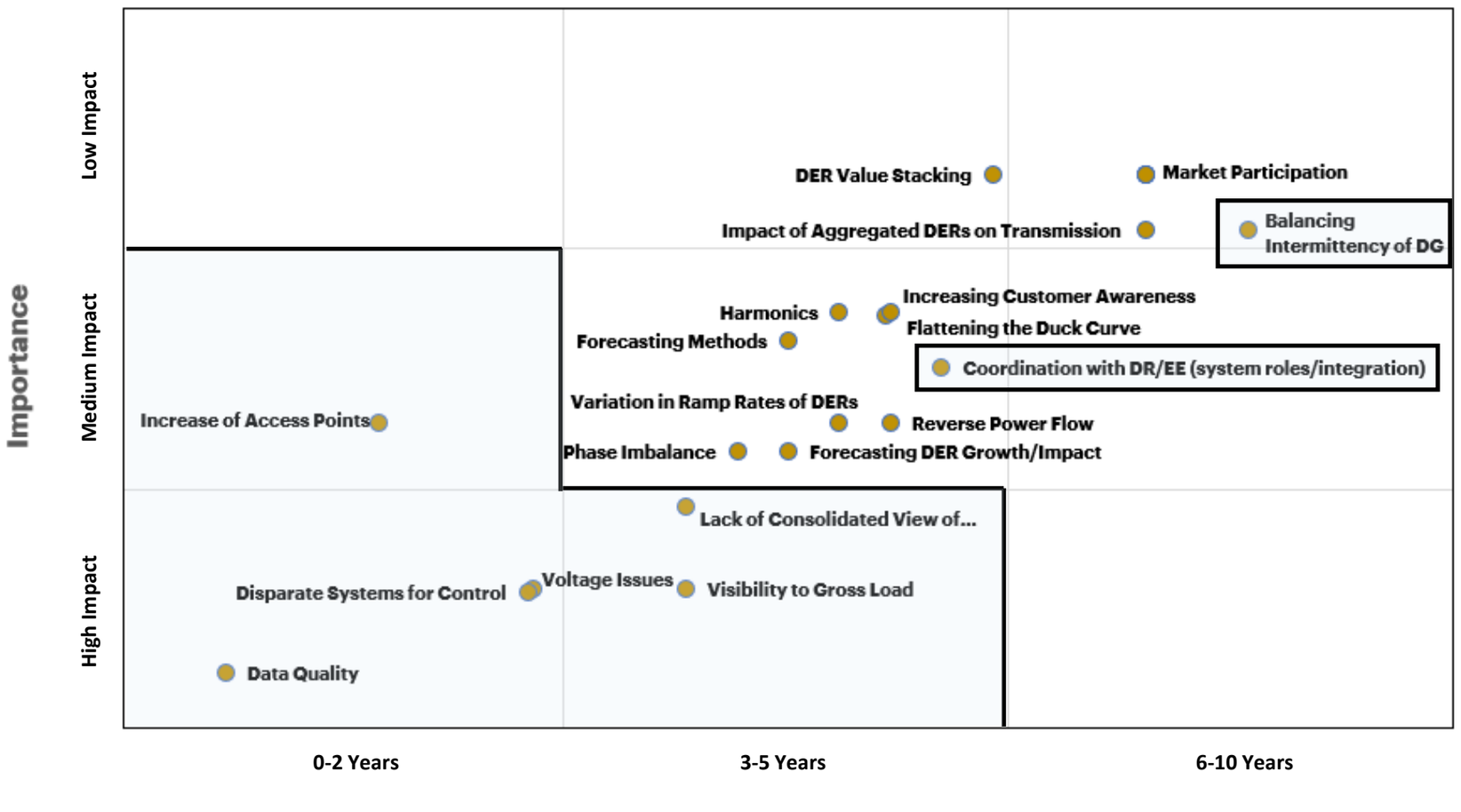


Host of other applications

- V2X grid
- Support as alternate storage source
- Increase utilization of RE source
- Congestion management
- Local Voltage Support
- BTM Optimization
- Load levelling
- Ancillary services

- Different use cases can provide different value to the grid
- Value of load to utility or grid operator depends on overlap of available hours with program need

Utilities need to Strategize for upcoming Challenges & Opportunities



Each challenge & opportunity be evaluated as “High Impact”, “Medium Impact”, or “Low Impact” against the Urgency to deployment.

Prioritize intervention In addition to:

- System and Data Integration
- IT Infrastructure WAN/FAN
- ADMS Upgrade Functionality, Timing
- Distribution System Platform (DSP)

LEGEND

FOCUS CHALLENGES & OPPORTUNITIES

Transitioning to digital and data driven grid operator is key for a safe, reliable, efficient and future-ready grid system with increasing distributed devices

1 Intelligent Grid

Improve network capabilities (including future DER integration), operation efficiency, and security resilience by using advanced application, new data sources and sensors

2 Digital Asset Management

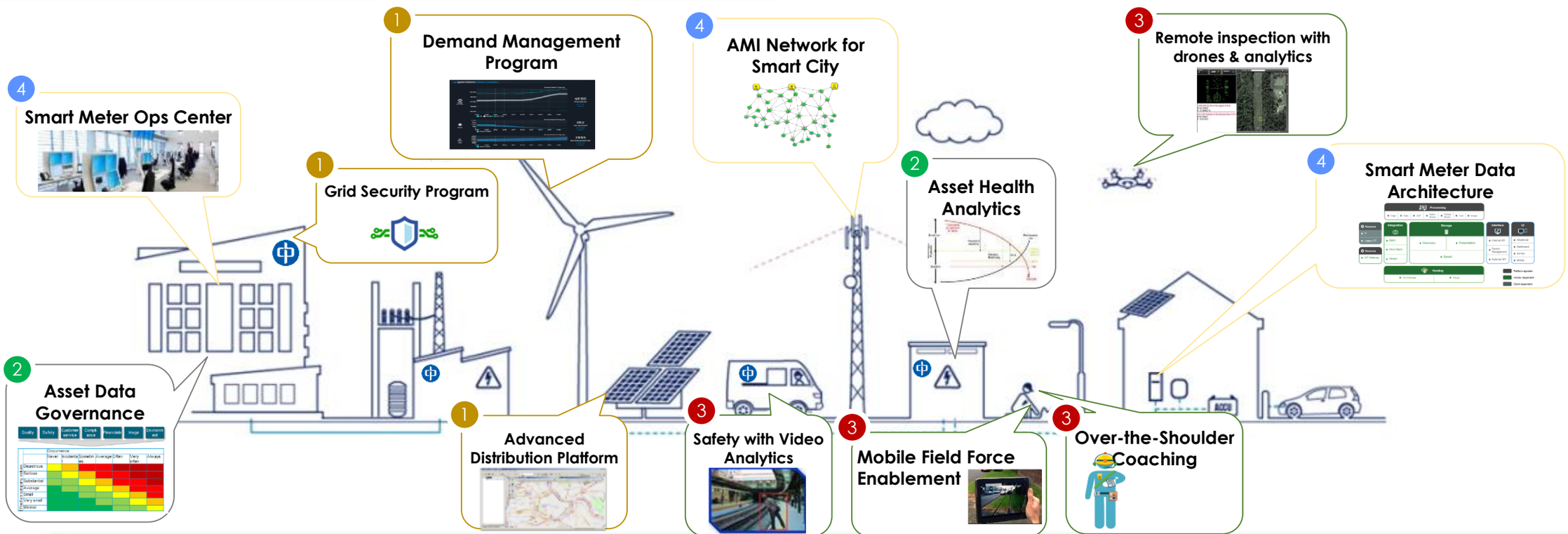
Increase Capex / Opex efficiency, reliability & optimize work programs through better decision making by using big data and analytics to generate predictable asset insights

3 Worker of the Future

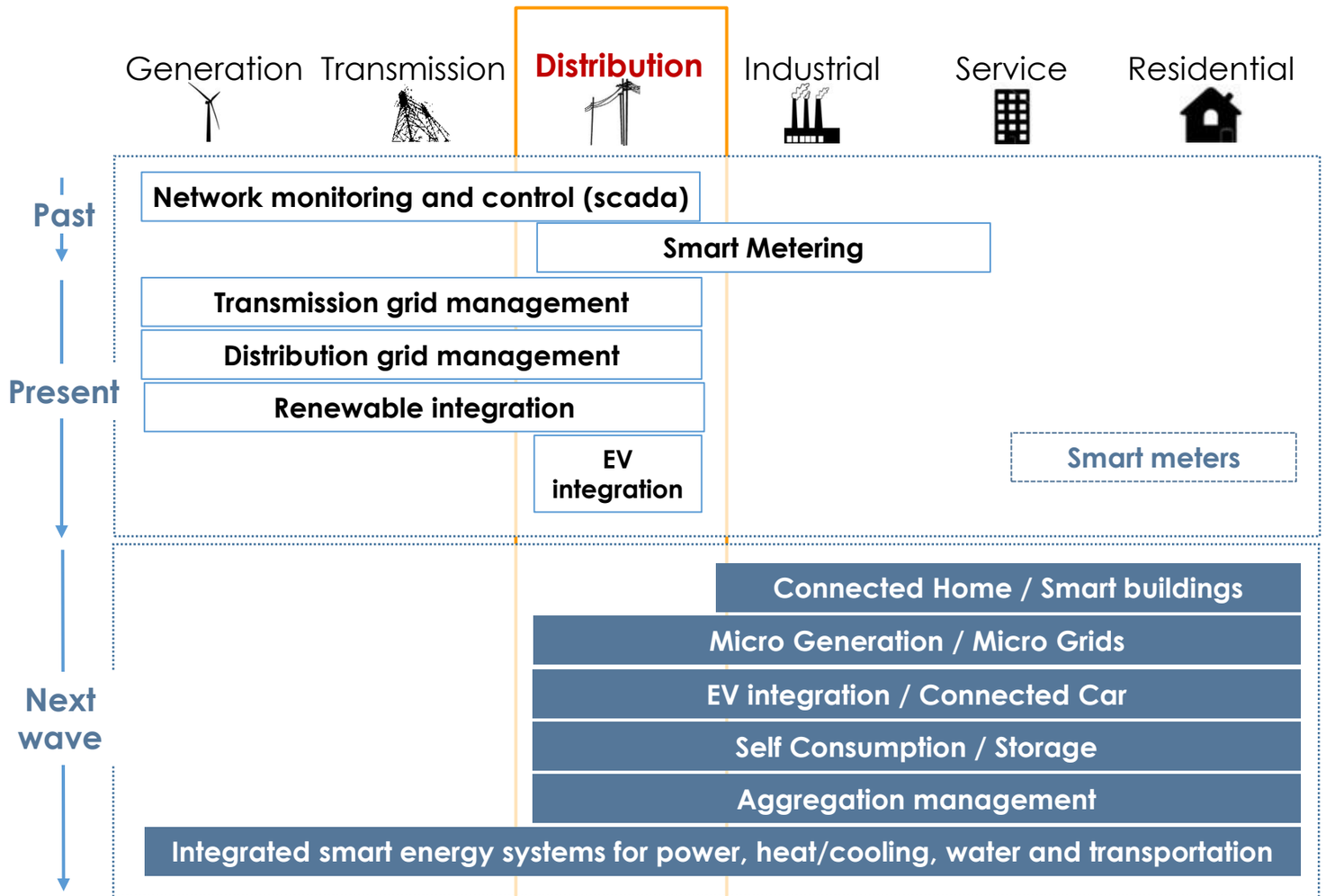
Increase field worker safety, productivity and optimize schedule & resource planning by leveraging integrated work planning, analytics and mobile technologies

4 Advanced Smart Metering

Improve end-to-end smart meter roll out & monitoring capability at scale by centralizing the operation functions, and **maximize the value of meter data** through integrated platform



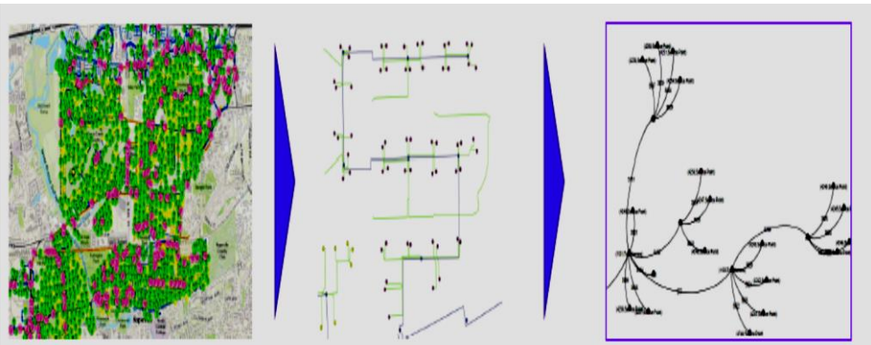
Near term to Long term System Planning Today can help transition to an Intelligent grid- a safe, reliable, efficient and future-ready grid system



Source

Effective start point must be Bottoms-Up Grid System Planning

SIMULATE FUTURE NETWORK MODEL



- Segment customer based on load profiles with different characteristics
- Create impact profiles for RTS, EV charging, BESS and other DER sources
- Plan impact of Energy efficiency, DSM on the future network

CONNECT, VISUALIZE AND ANALYZE

- Rapid scale up of Smart metering program
- Implement digital interventions to digitize and monitor supply and demand sources

BUSINESS INTERVENTIONS

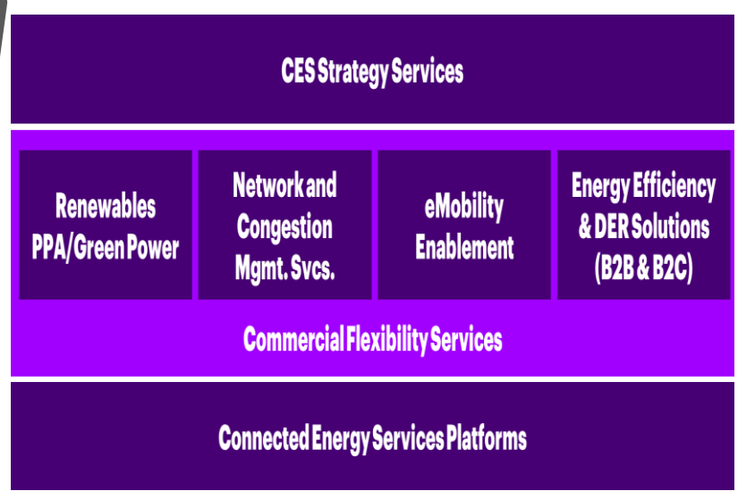
New Business models for

- RTS, EV and Storage
- Microgrids / Local energy services
- Customer RE needs

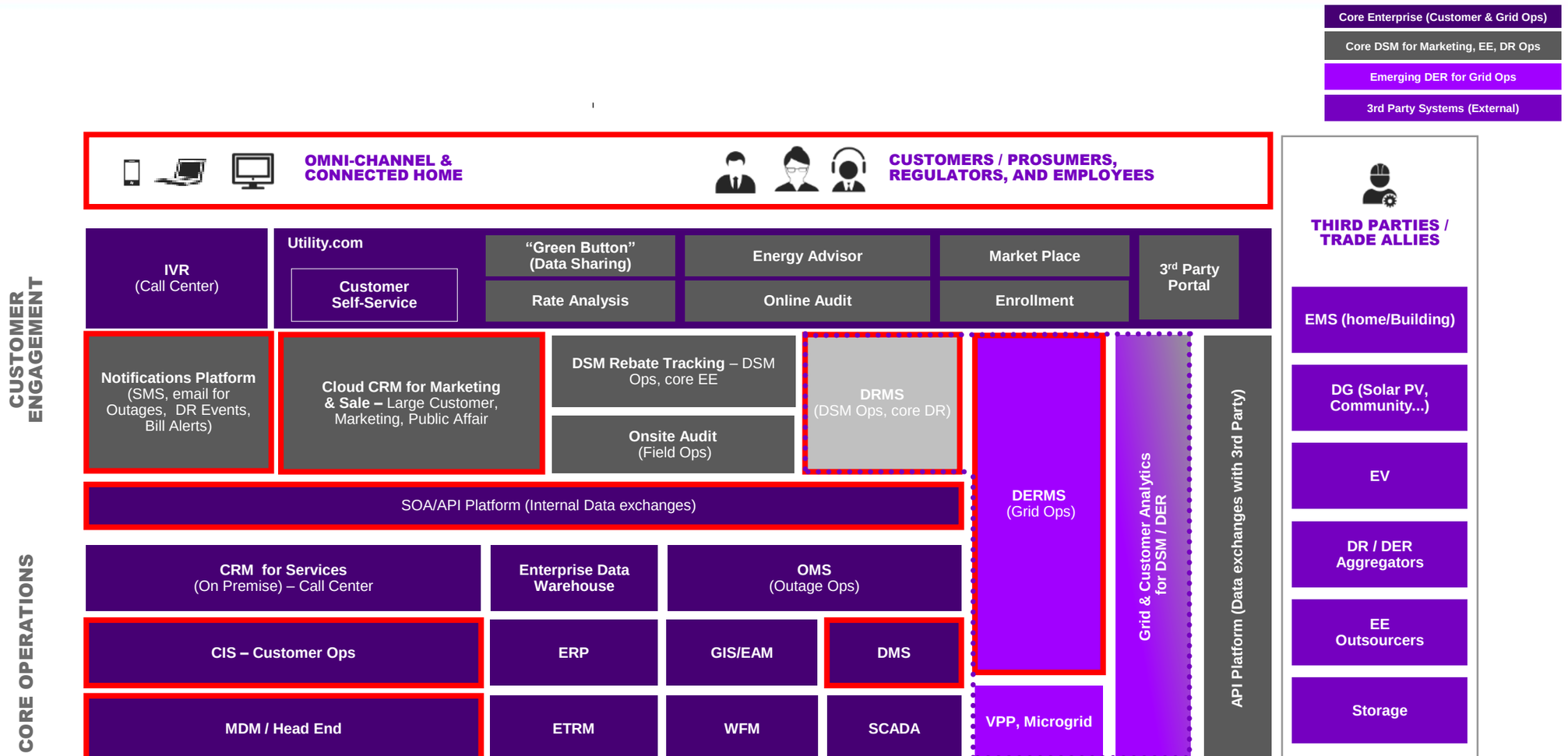
Value stack creations for DER application

PROCESS TRANSFORMATION

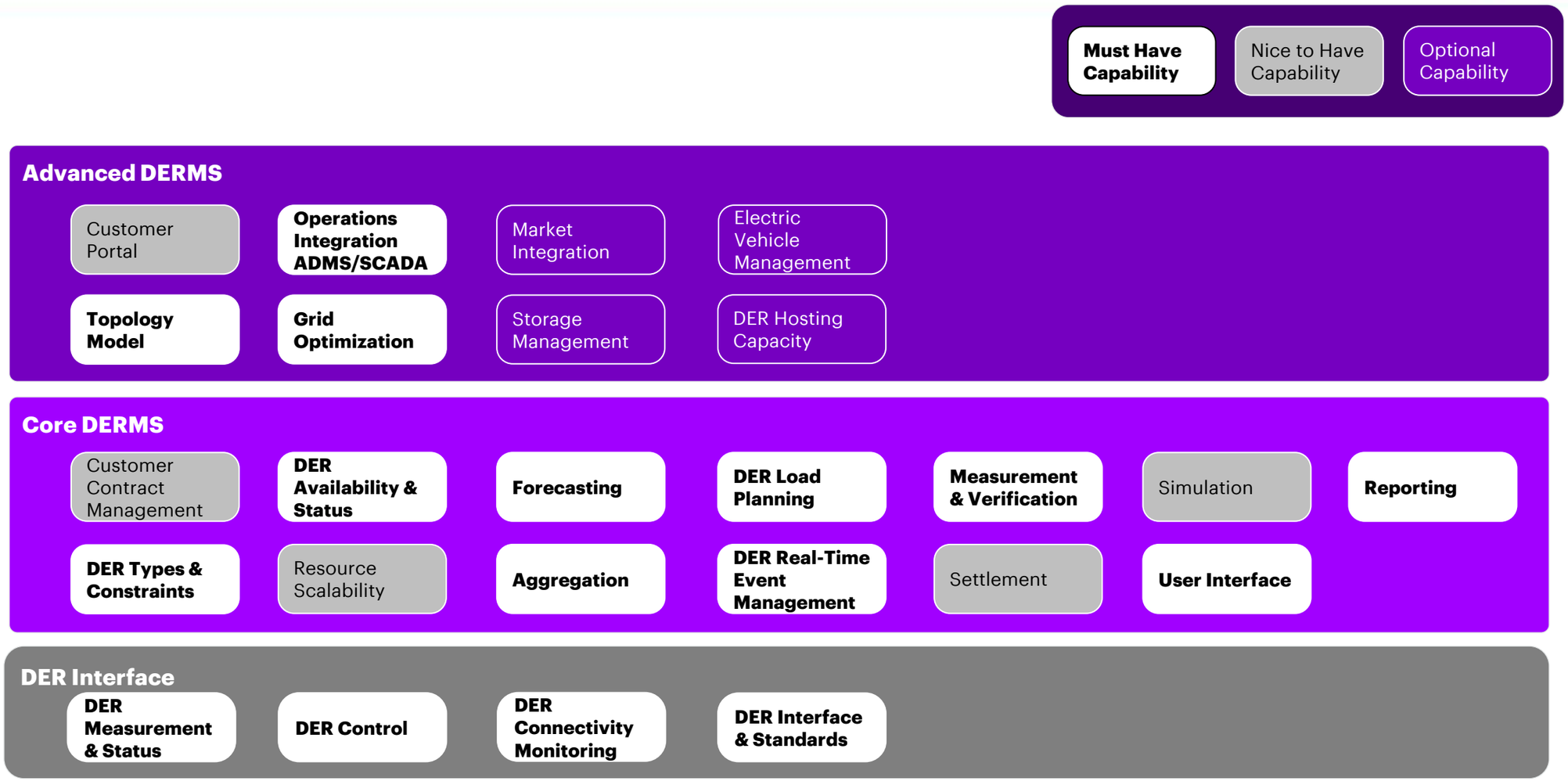
- DERMS implementation to manage new DER sources
- Pilot new business models
- Align and optimize grid operations
- Gradually prepare to transform to Connect Energy services



The DERMS will be a key building block in the future state architecture for DER- Impacts of the implementation will cut across many groups



Key Tenets of DERMs



Thank You

India Smart Grid Forum
CBIP Building, Malcha Marg,
Chanakyapuri,
Delhi-110021
Website: www.indiasmartgrid.org