BSES Rajdhani Power Limited

India Smart Grid Forum

SESSION - 1: Digitalization in Discoms

Distribution Systems and Processes - Digitalization Roadmap

27th November 2020

Presented by

Abhishek Ranjan

AVP & Head Renewable and New Initiatives,

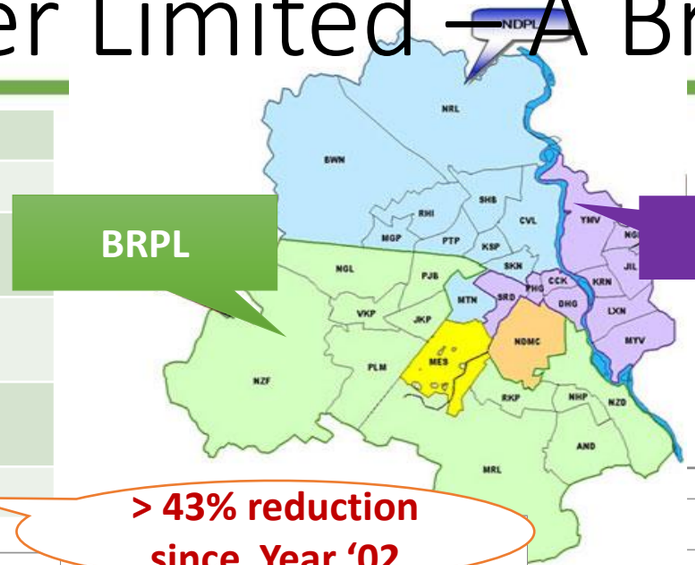
BSES Rajdhani Power Limited

Agenda

- BSES Rajdhani Power Limited – A Brief Profile
- Digitalization in Utilities - Ecosystem
- Key Initiatives
- The Road Ahead

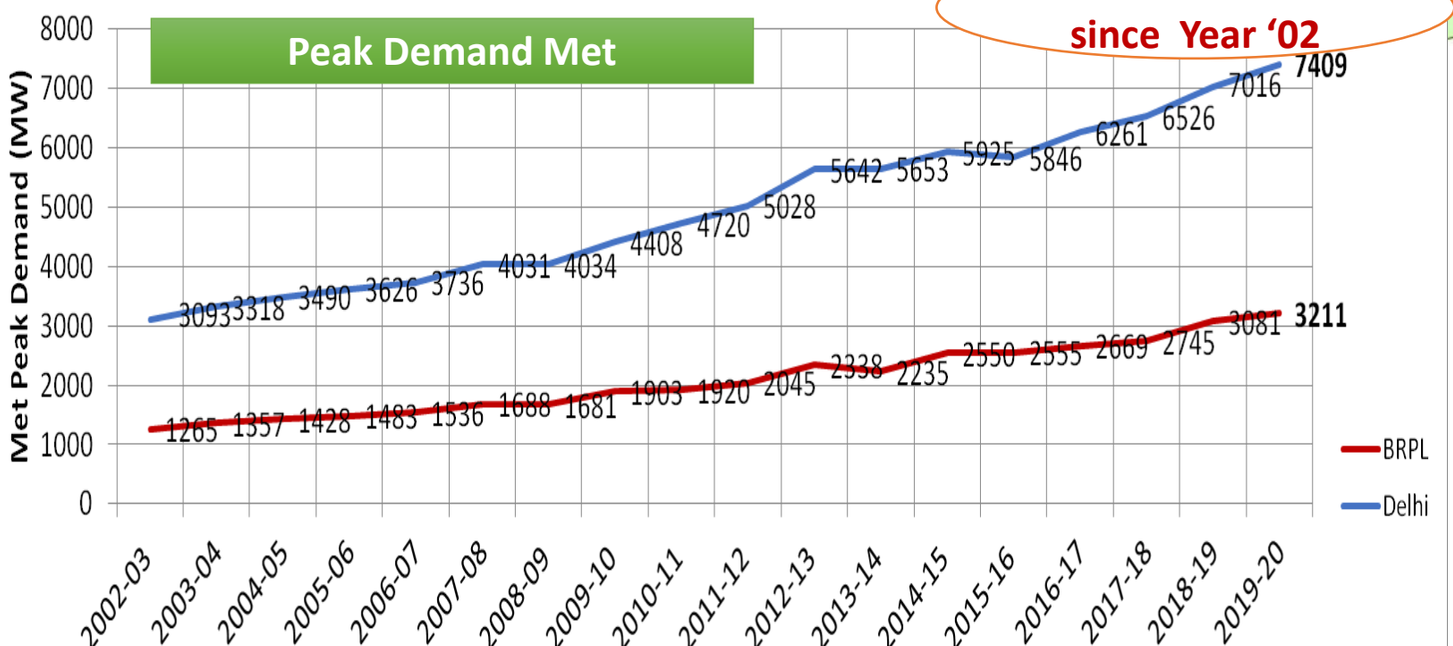
BSES Rajdhani Power Limited – A Brief Profile

Distribution Area	750 sq. Km
No. of customers	2.55 Mln.
Customer Density	3400 /sq Km
Max Demand met (Till Date)	3211 MW
Annual Billed energy FY19	12,194 MU
AT&C Loss FY19	8.06 %



> 43% reduction since Year '02

Peak Demand Met



The largest serving Distribution Utility in the National capital

Consumer Mix

About 86% residential contributing to ~70% consumption

RE ~ 29% of portfolio (1300MW+) by '22-23

Oct '20
> 72 MWp RTS

Digitalization in Utilities - Ecosystem

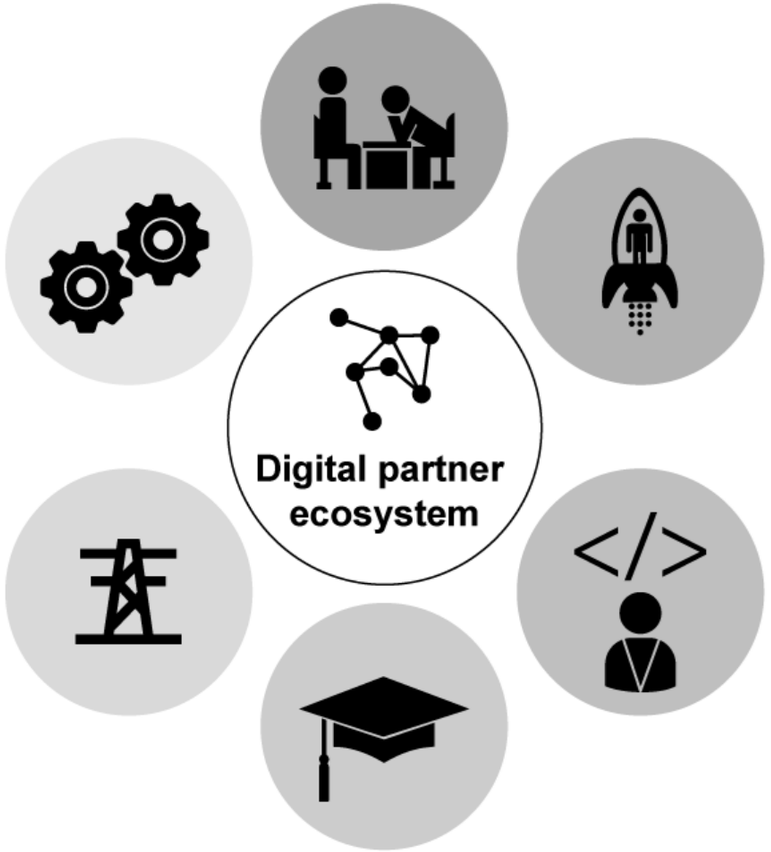
Talent firms
Help identify and recruit high-caliber digital talent

Managed service providers
Support production and delivery of digital efforts at scale

Cloud services providers

Start-ups
Test broader digital ambitions and promote new technologies and ways of working

Agile Innovators



Industry peers
Share best practices and valuable learnings with other utilities

Indian and Global Utilities

Independent third-party developers
Provide technical talent to help build digital projects

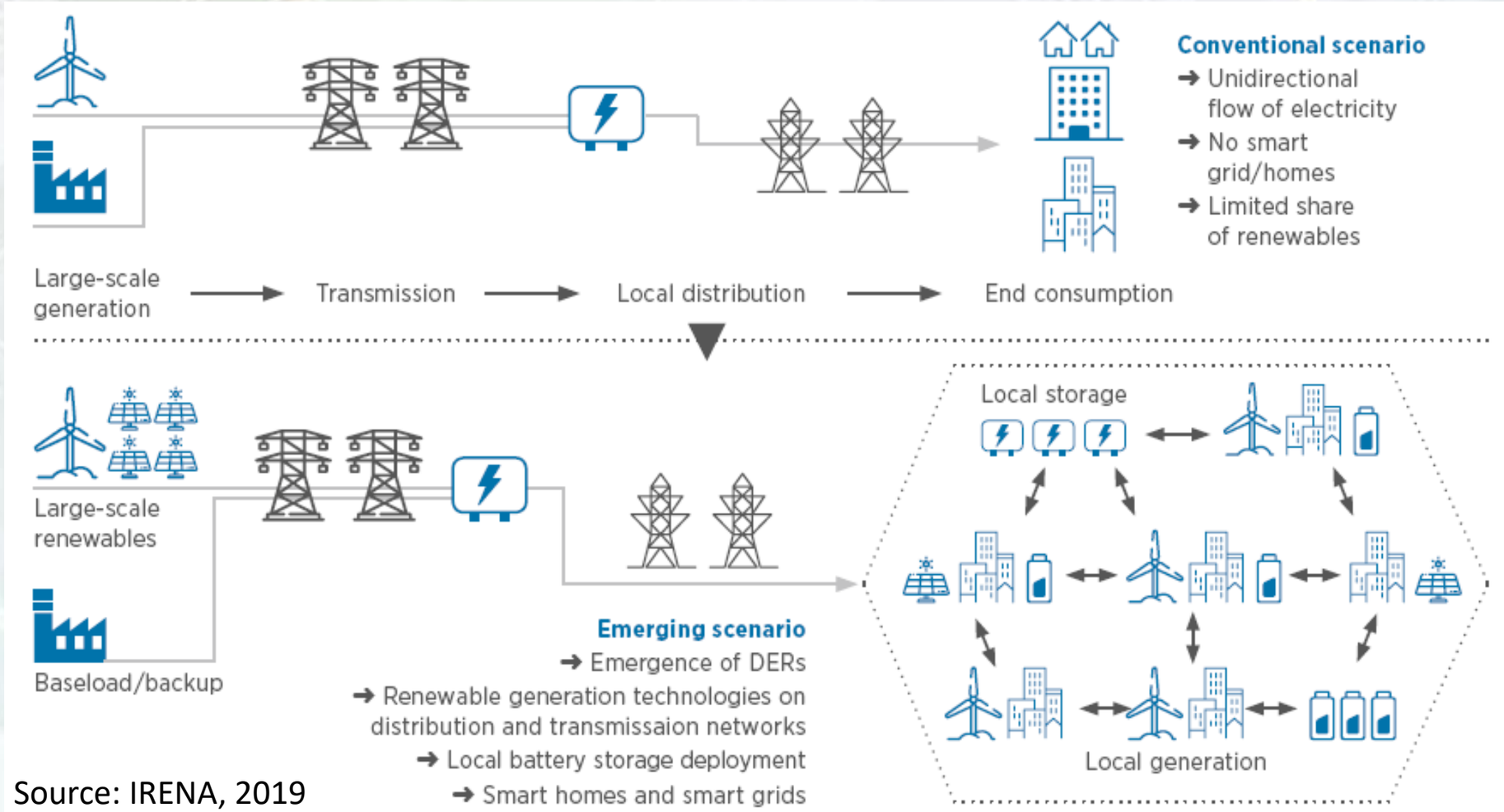
Automation partners

Academic institutions and think tanks
Explore and develop new ideas for digital technology

IITD, IITK,IIMA, TERI, GIZ, NREL, AEEE, WSU, SEPA, IRENA etc

Source: Bain & Company

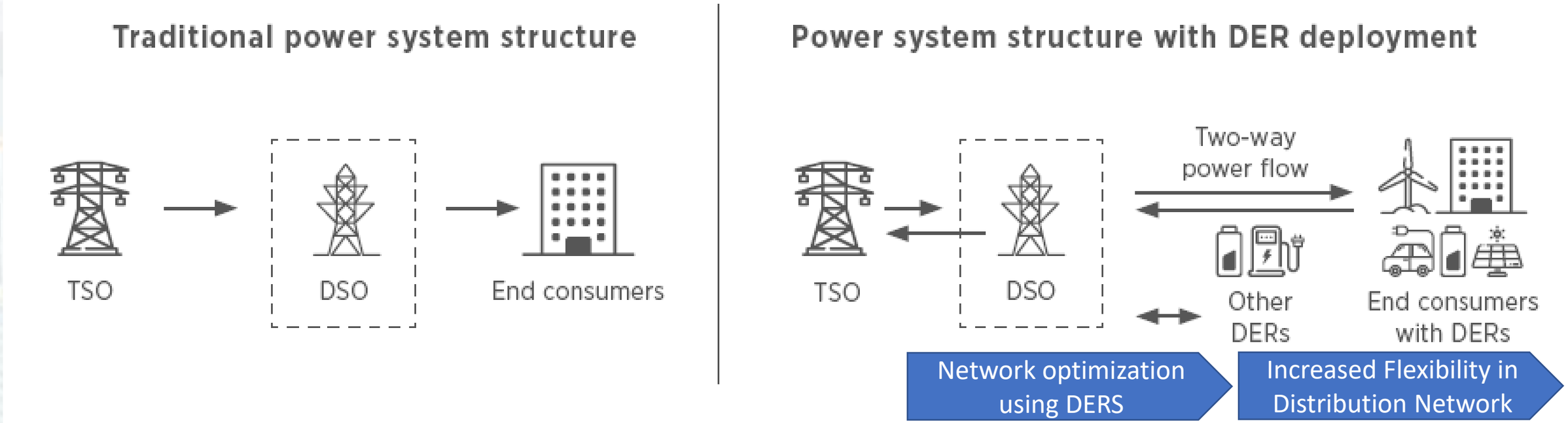
Digitalization in Utilities – Key drivers



Source: IRENA, 2019

Distributed Energy Resources | Smart Homes | Consumer to Prosumer transition | Agile LV Grids

Digitalization in Utilities – Key driver



CONVENTIONAL ROLES OF DSO

- Connection and disconnection of DERs
- Planning, maintenenace and management of networks
- Management of supply outages
- Energy billing (only if vertically integrated)

+

EMERGING ADDITIONAL ROLES OF DSO

- Peak load management through DERs
- Network congestion management
- Provide reactive power support to TSOs
- Procure voltage support
- Technical validation for power market

The role of traditional Discoms is transforming to Distribution System Operator

Distribution Functions – Digitalization

SYSTEM PLANNING		CUSTOMER ENGAGEMENT	
▪ Load Forecasting ▪ Resource Adequacy ▪ Distribution Planning ▪ Hosting Capacity Analysis	▪ Locational Value Analysis ▪ IRP, T&D	▪ Service Connections ▪ Billing and Account Management	▪ Education ▪ Financing ▪ Rates
SYSTEM OPERATION		**DATA STEWARDSHIP**	
▪ O&M "Wires" ▪ Dispatch and Balancing ▪ Optimization	▪ Sensing and Comms ▪ Interconnection ▪ OMS and Restoration	▪ Data Collection ▪ Data Ownership ▪ Data Analytics	▪ Data Protection ▪ Data Dissemination/ Access ▪ Value Added Services
ASSET DEPLOYMENT		**MARKET MANAGEMENT**	
▪ Distribution Wires, Poles, and Transformers ▪ Distributed Energy Resources	▪ Metering, Sensors and Comms ▪ Control Systems ▪ Service Equipment ▪ Spares and Restoration	▪ Aggregation ▪ Sourcing Grid Services ▪ Settlement	▪ Price Formation ▪ Market Management ▪ Reliability and Quality Assurance

Source: Smart Electric Power Alliance, 2019.

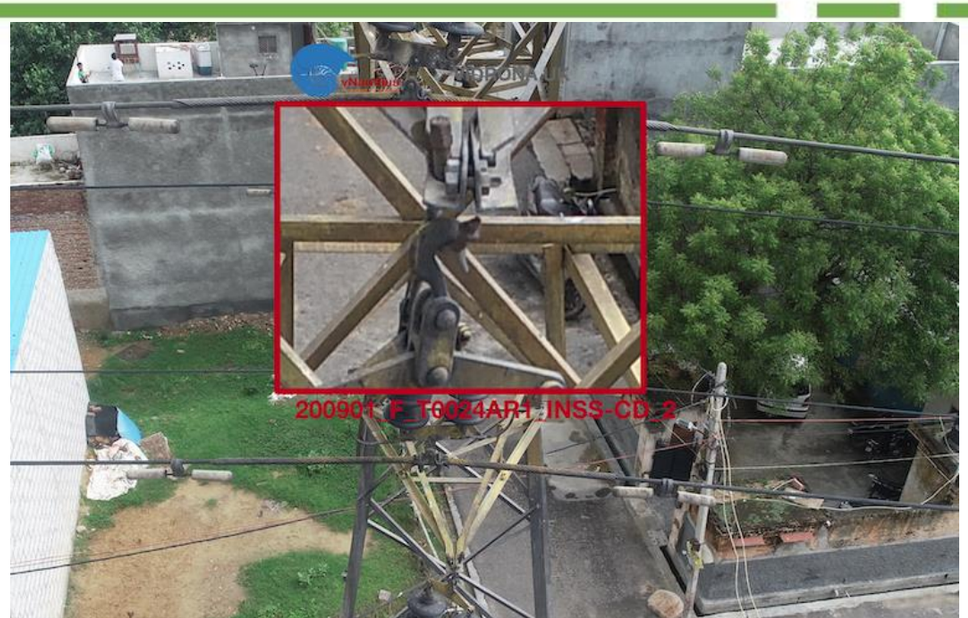
Key takeaways

- Digitalization starts from existing funcstions
- Legacy systems on-boarding – key to success
- Digitalization & Automation is a continuous process

Few key Initiatives

Predictive Maintenance of Assets

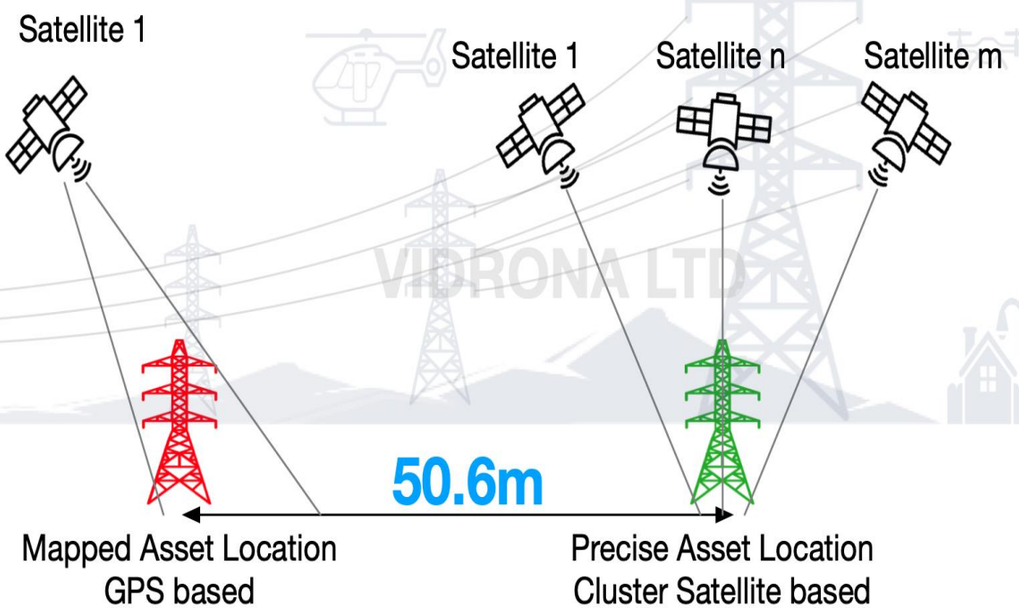
Source: Vidrona Ltd. UK, BRPL



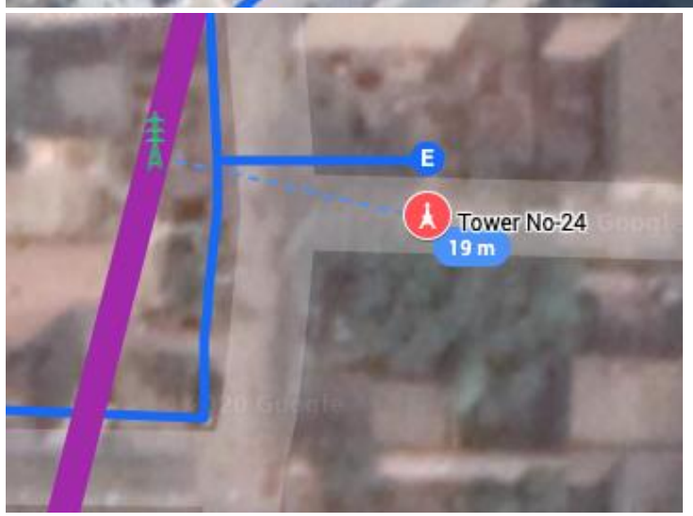
Few Key Initiatives

Asset mapping (Digital Twin)

Disparity between the actual asset location vs mapped asset location



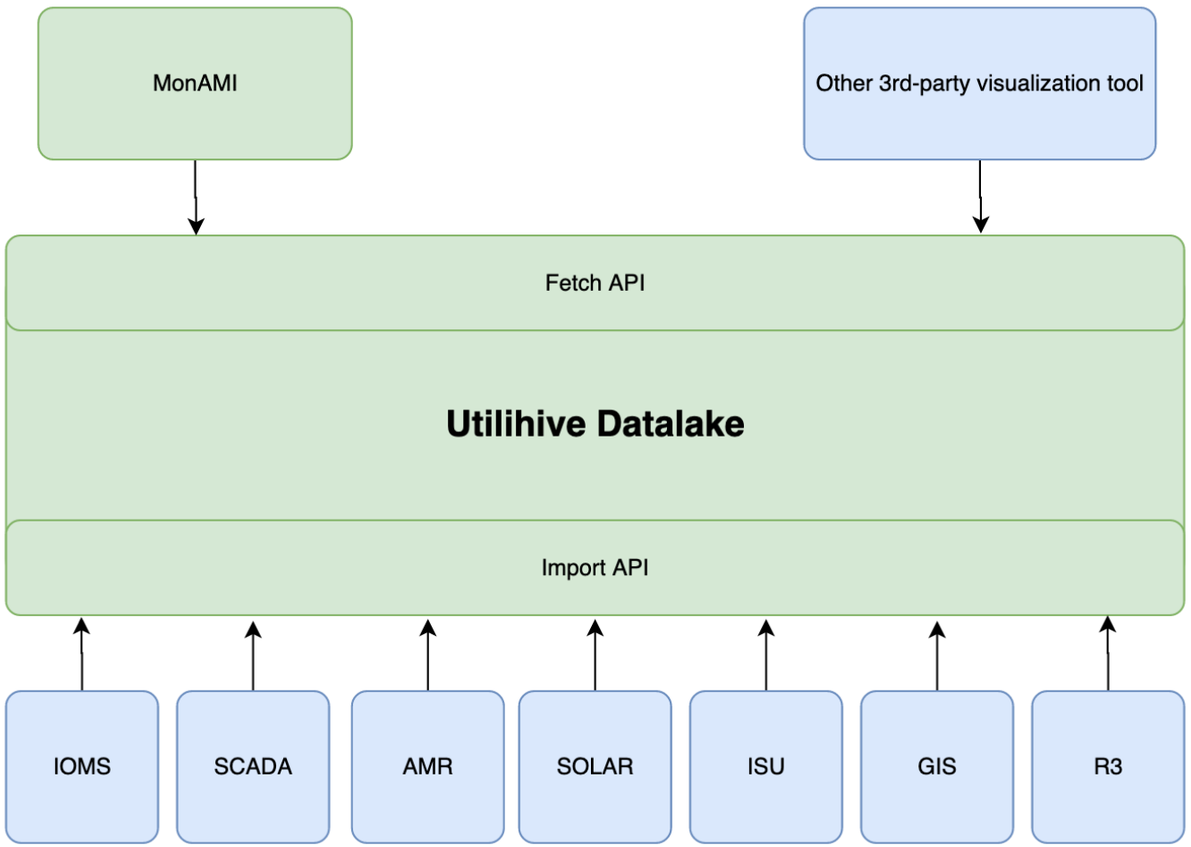
Example disparity distance between the two measurements = 50.6m

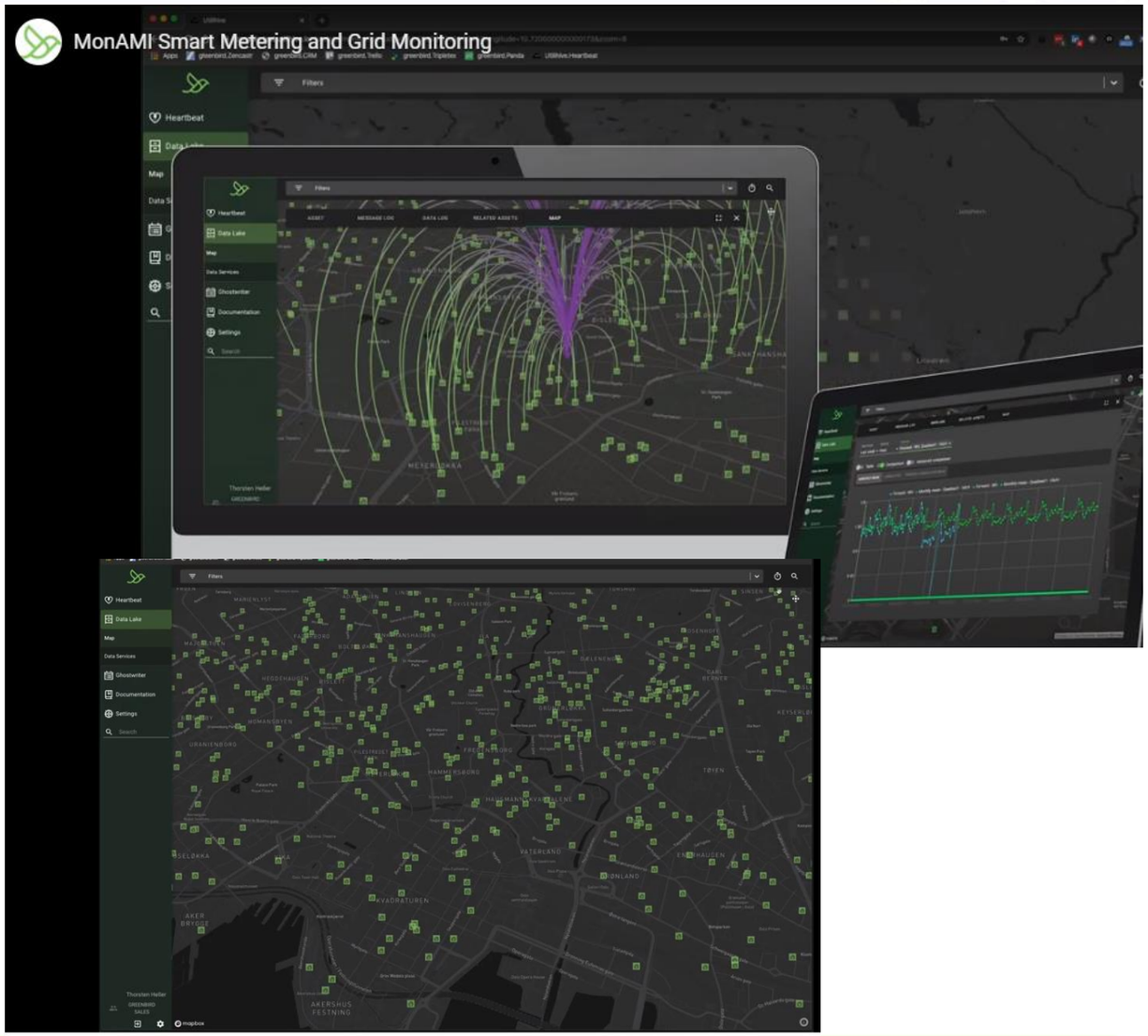


Source: Vidrona Ltd. UK, BRPL

Few Key Initiatives

Utility Data Lake

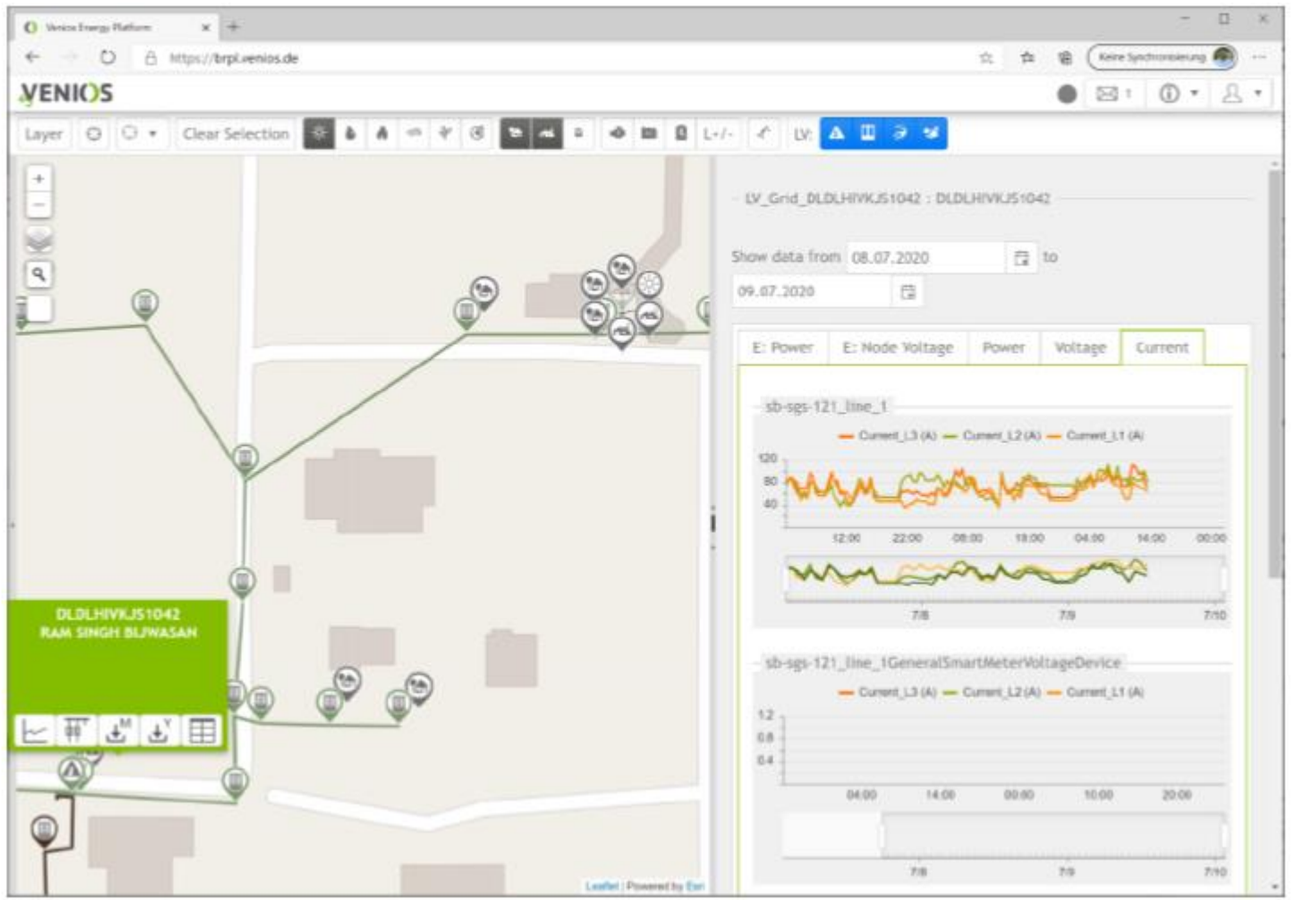


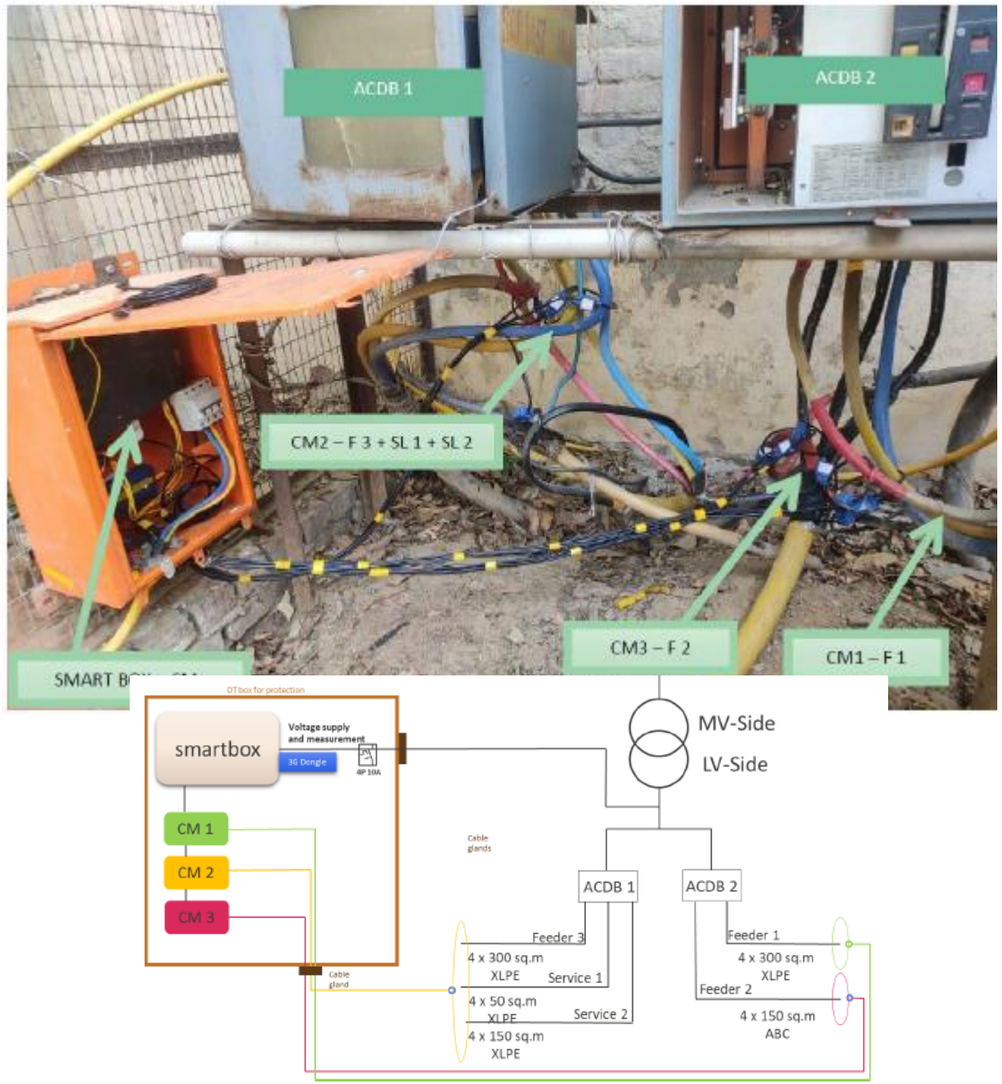


Source: Greenbird, BRPL

Few Key Initiatives

LV Smart Grid





Source: Panitek, Venios, Smart Grid Solutions, BRPL

Summary & Road Ahead

- Digital Transformation journey has been catalyzed by RE penetration
- Mapping Legacy process with new emerging roles is essential
- Business in the driver seat along with IT support – key to success
- Regulatory and Policy transformation have to keep pace

Thank You

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