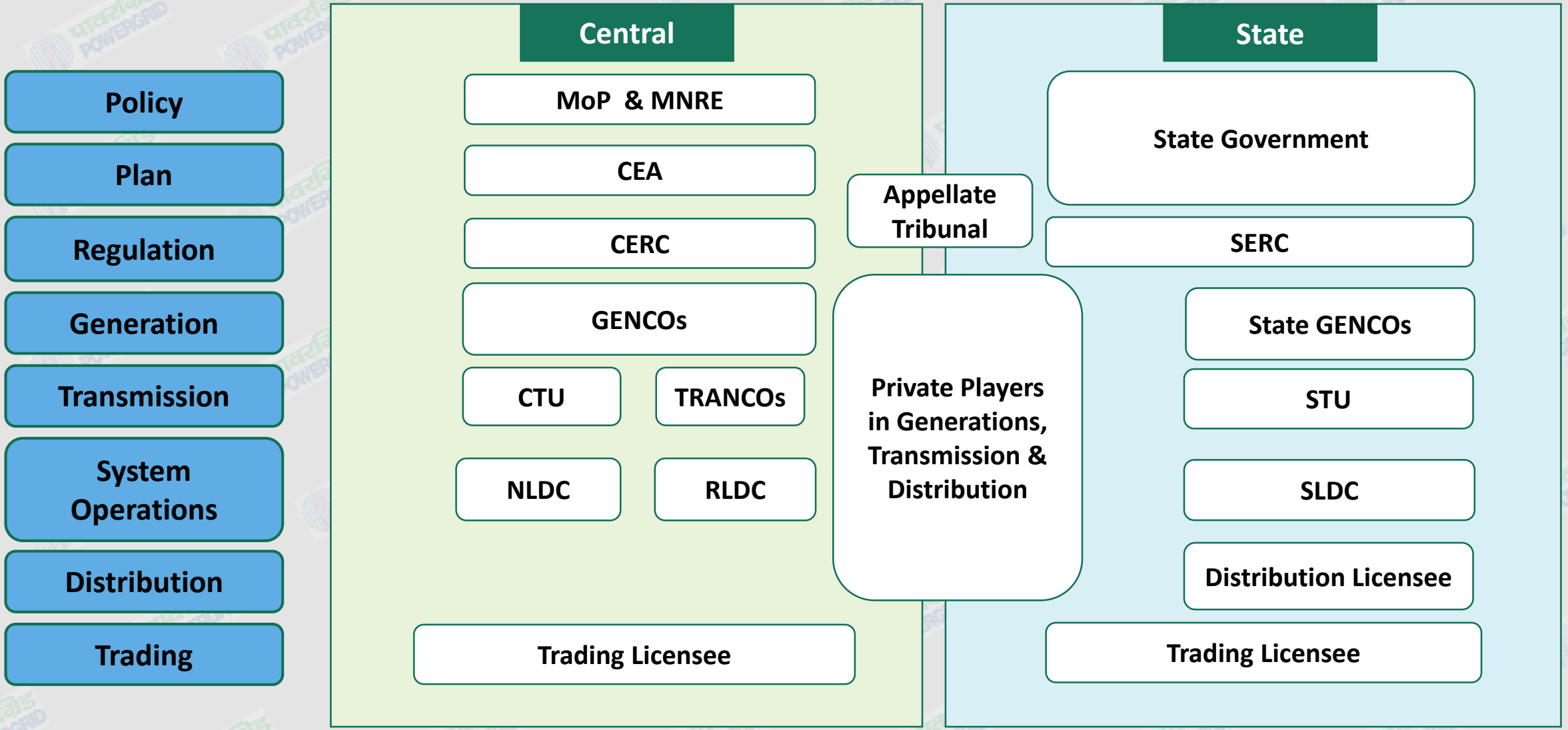
Digital Acceleration – The PSU Perspective

POWERGRID Journey

Institutional framework – Power Sector



Digitization Historical Initiatives

Digitization has been primarily through Central Initiatives Public Utilities

- Asset & Operation management – GENCOs
- Transmission by Grid Operation Requirements → CTU
  - Unified load dispatch and communication (ULDC) Scheme 1998-2008 > 1500 (now 3500) RTUs and > 30 RLDC/SLDC

Power Exchange and attended data for Market (Exchange) 2008-onward

Digitization in distribution sector was optimization driven and gained momentum with schemes like APDRP, RAPDRP, IPDS and now RDSS

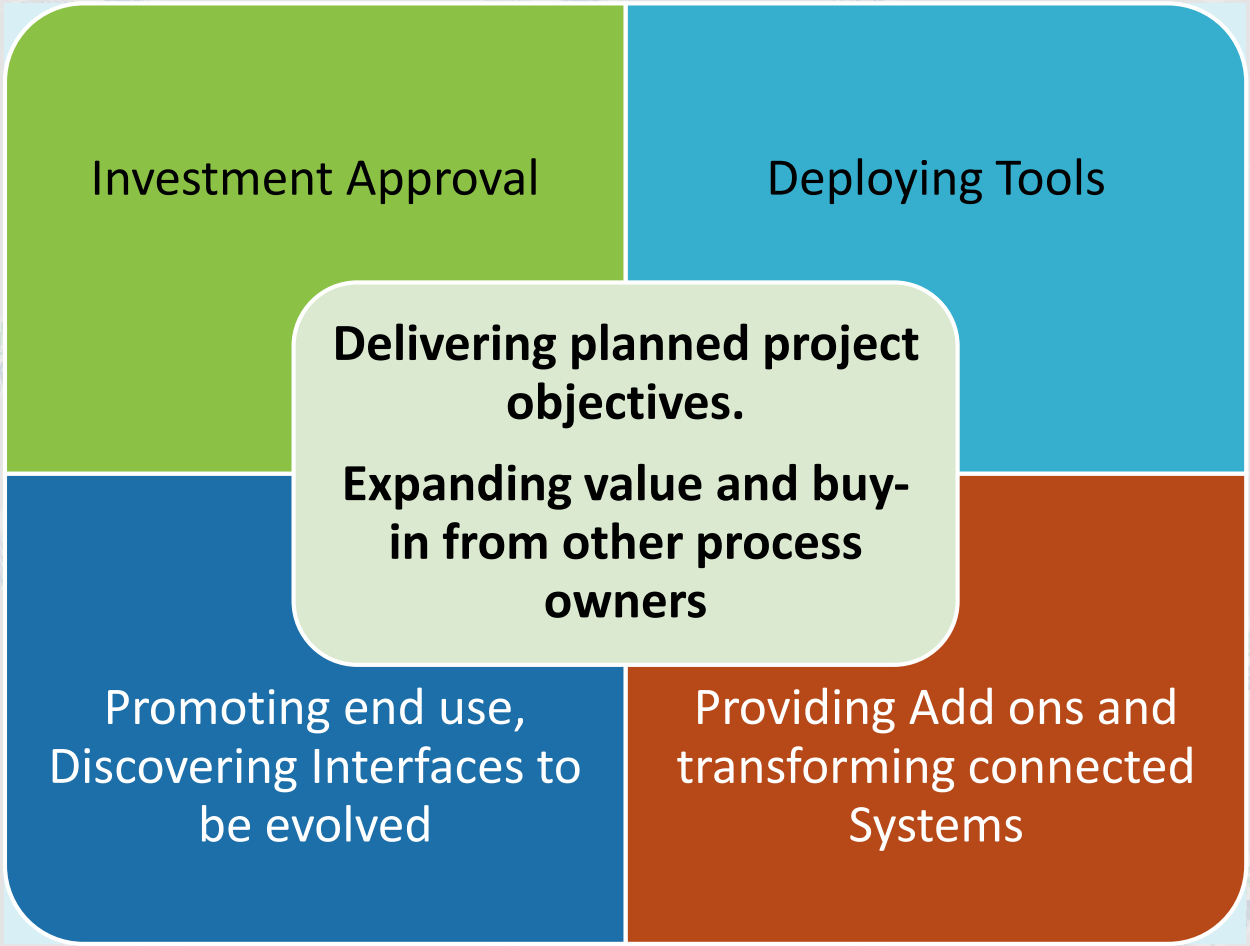
• GIS	State →16	DISCOM →22		
• ERP	23	39		
• IT	24	→46	Towns → 1588	
• RT-DAS	21	→35	1643	S/S→ 3936
• AMI	xx	xx	Million	

One nation-One Grid initiative precipitated Situation Awareness (SA) Requirement

- URTDSM (2013-2016): Phasor Measurement Units (>1800 PMUs)
  - State/ Regional and National Operator
- Enhance RE awareness REMC (2015 -18) →14
  - Whether Forecast and RE footprint → 14+4

Digitalisation – Decision Making

- Digitalisation cannot evolve without internal critical Mass
- Projects are initiative for Tooling in Digitalization, Business reengineering gives internal pull ("Catalyst")
- Organisation need to demonstrate clear positive benefits to stake holders ("Business Case")



Digitalisation Initiatives of POWERGRID summarised as

- ✓ **Digitization of Data**
  - ✓ SAP for business transactions
  - ✓ SCADA for Control & Protection
  - ✓ ESS for Employees personnel & financial automation
  - ✓ E-office for file movement

- ✓ **Digitalization of processes**
  - ✓ Automatic Fault Analysis System (AFAS) for accurate fault localization
  - ✓ Logging of grid parameters via PMU and WAMS
  - ✓ Recording Substation maintenance data through robotic inspections
  - ✓ PALMS for asset lifecycle management
  - ✓ PG-DARPAN for Transmission Line Patrolling
  - ✓ Bill Tracking system
  - ✓ Inspection Management system
  - ✓ Digital Procurement to pay process etc.

Digitalisation Initiatives of POWERGRID summarised as …. Contd.

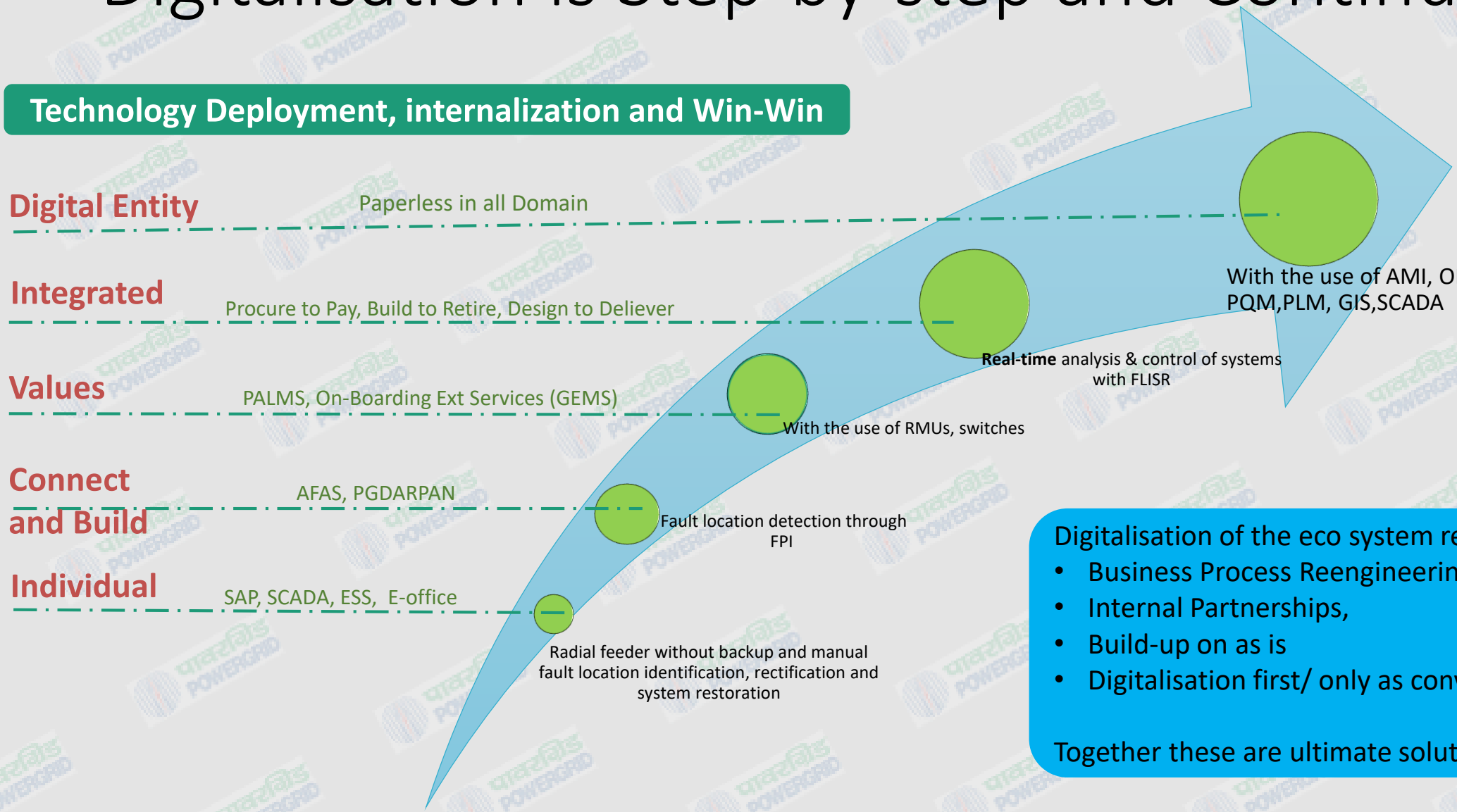
- ✓ **Digital Transformation models**
  - ✓ Remote Operation of Substations via NTAMC & RTAMC
  - ✓ Use of GIS tools for proactive emergency response
  - ✓ Creation of Digital Substations
  - ✓ Creation of Chatbots for operational queries and self help
  - ✓ Dashboards for decision making etc.

Impacts

- ➢ Improvement in efficiency and performance
- ➢ Optimization of human resources
- ➢ Reduction in manual interventions
- ➢ Real time visualization of substation assets
- ➢ Centralized real time monitoring of substations

Digitalisation is Step-by-step and Continuous

Technology Deployment, internalization and Win-Win



Digitalisation of the eco system requires

- Business Process Reengineering,
- Internal Partnerships,
- Build-up on as is
- Digitalisation first/ only as conviction

Together these are ultimate solution

and

Journey continues .....