WORLD BANK GROUP | KOREA GREEN GROWTH TRUST FUND | Ministry of Economy and Finance | Jeju 제주특별자치도 Jeju Special Self-Governing Province

Smart Grid Landscape and Roadmap for the City of Cape Town

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Joint KGGTF-ESMAP
Energy Breakout Session

ESMAP
Energy Sector Management Assistance Program

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Cape Town at a glance

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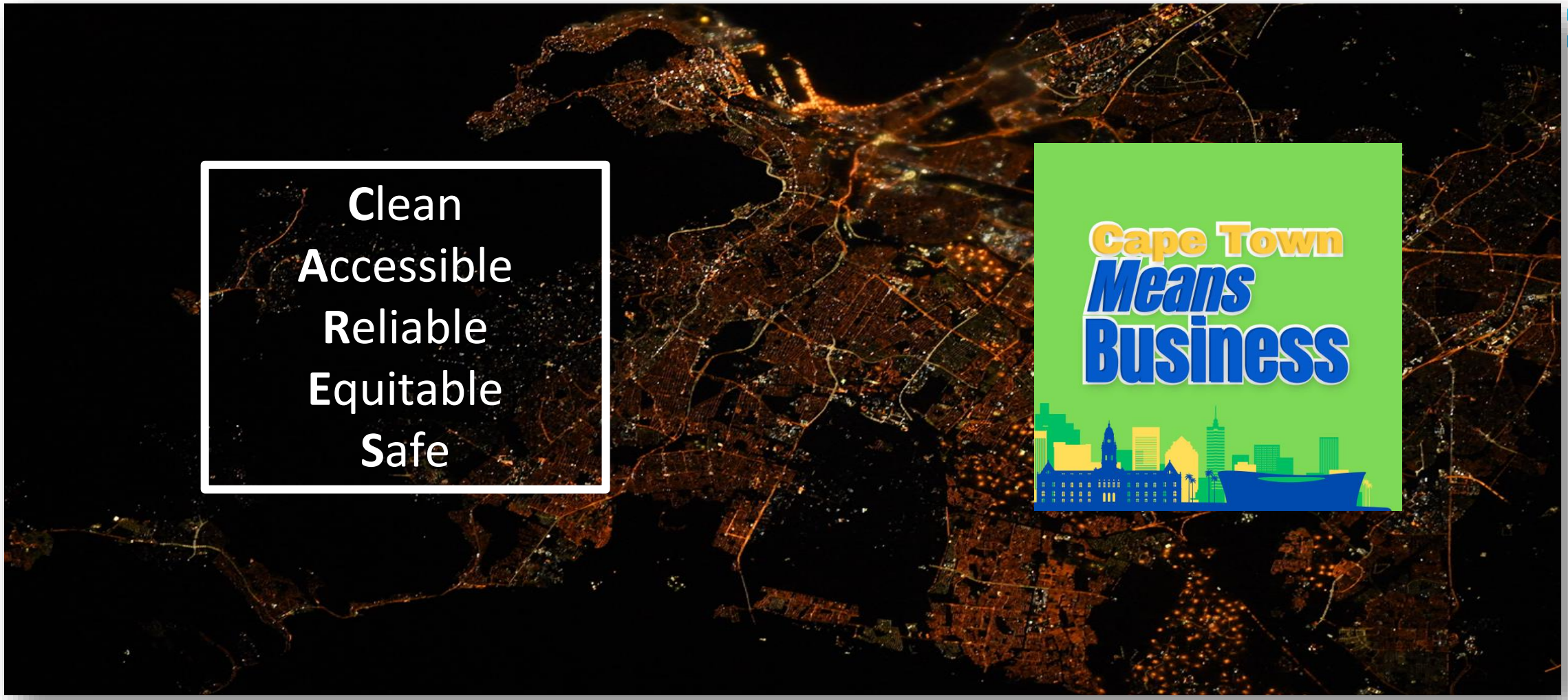
Mission and Vision



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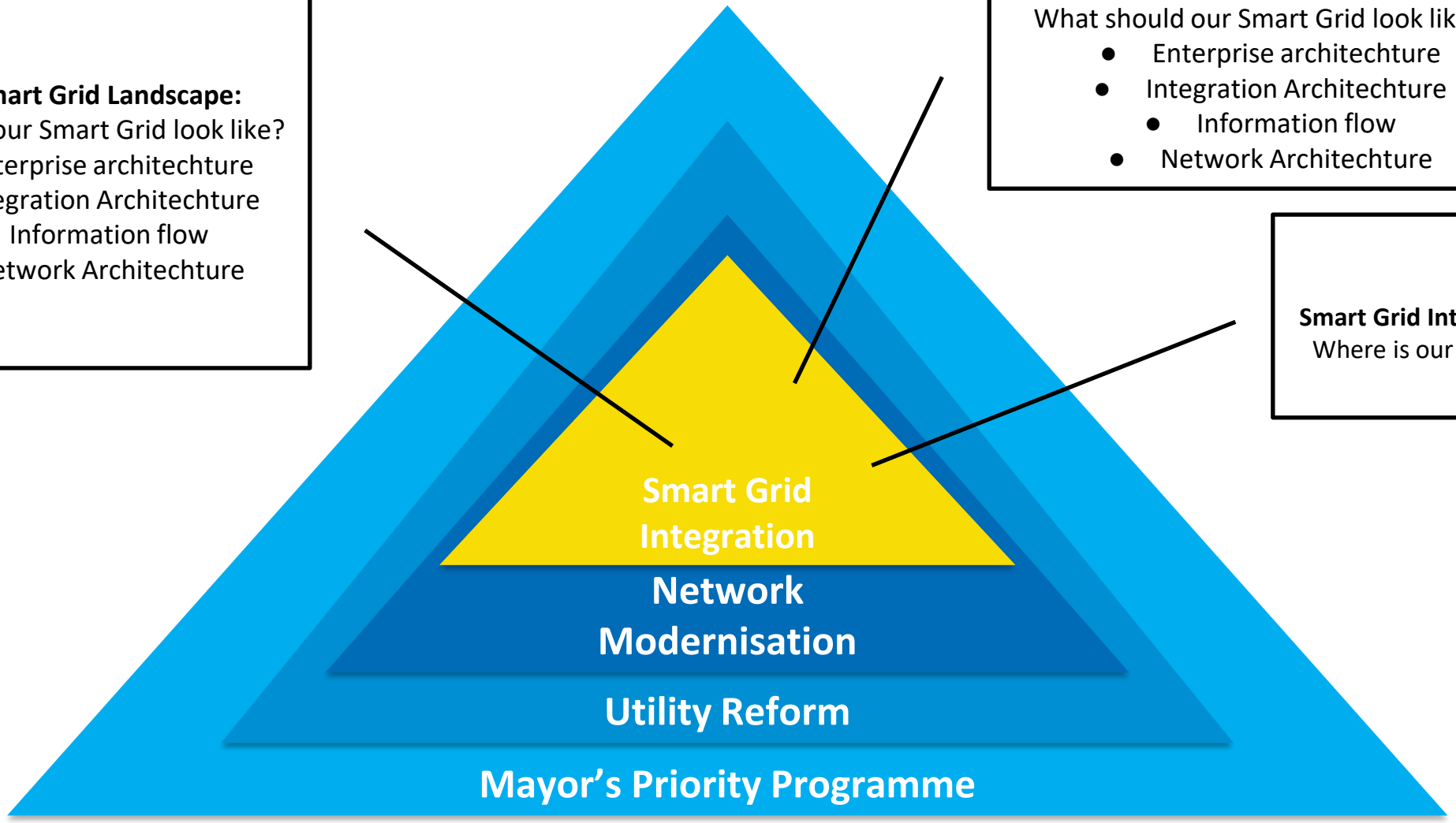
Smart Grid projects

As-is Smart Grid Landscape:
What does our Smart Grid look like?
- Enterprise architechture
- Integration Architechture
- Information flow
- Network Architechture

To-be Smart Grid Landscape:
What should our Smart Grid look like?
- Enterprise architechture
- Integration Architechture
- Information flow
- Network Architechture

Smart Grid Integration Roadmap:
Where is our Smart Grid Going?



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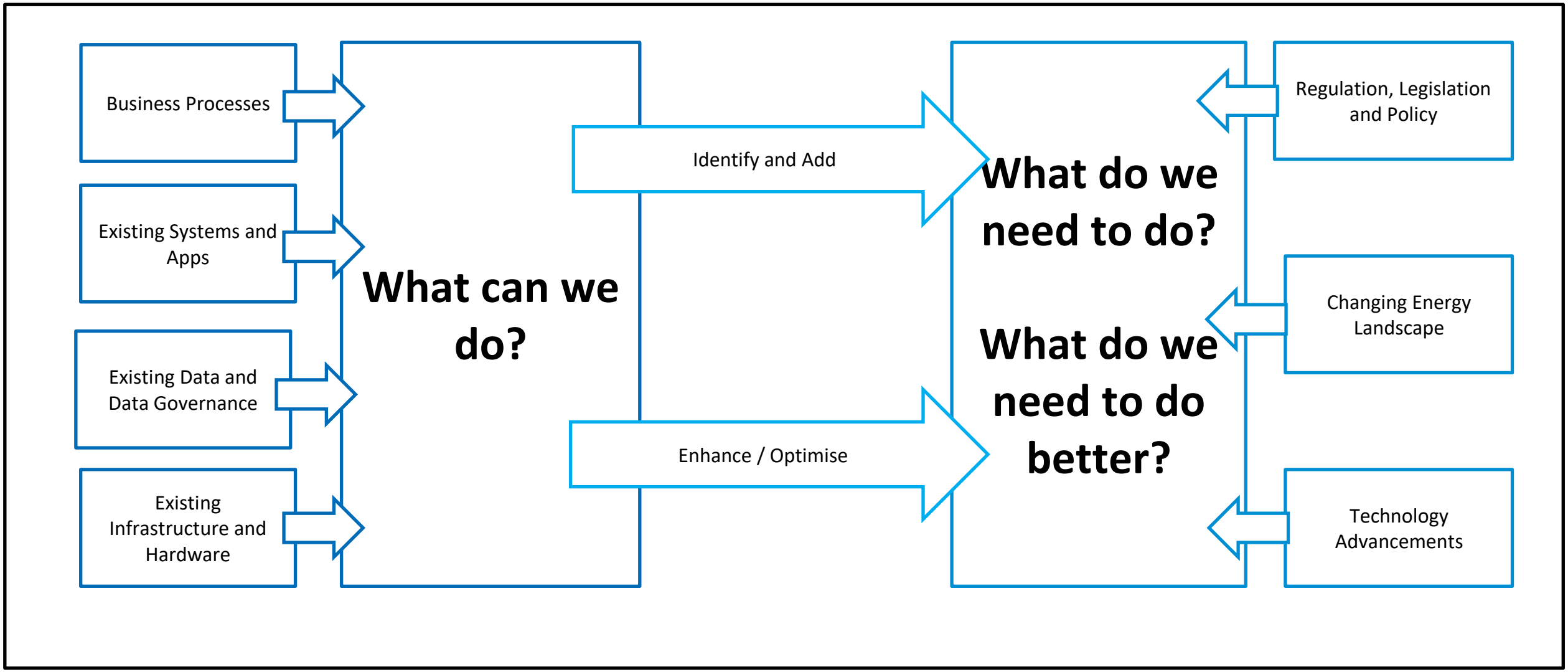
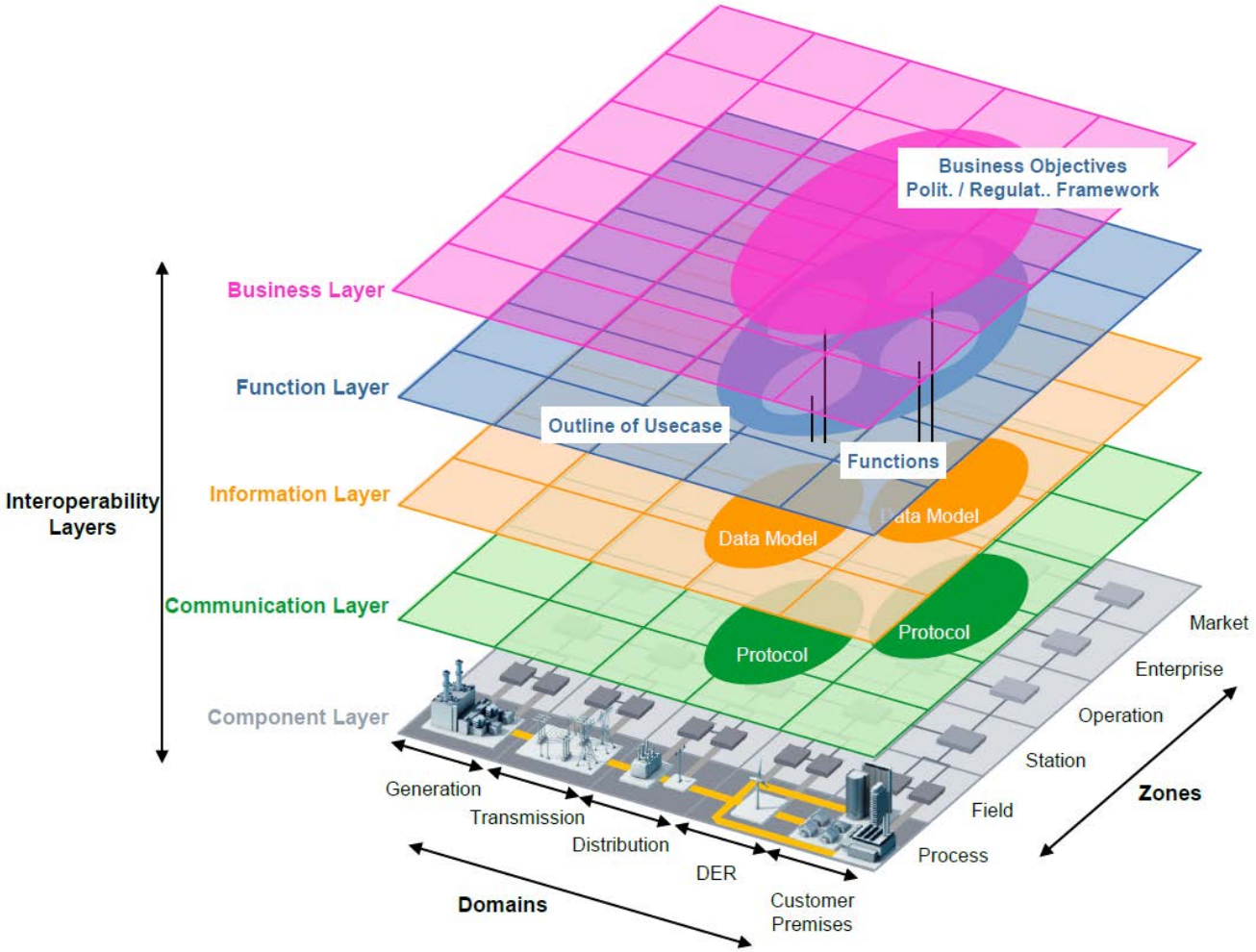
Framework for a Smart Grid Landscape and Roadmap



Best Practice: Smart Grid Landscape and Roadmap



Source: CEN-CENELEC-ETSI Smart Grid Coordination Group

Titlec
IEC 61968:2020- Application integration at electric utilities - System interfaces for distribution management
IEC 61970:2023 - Energy management system application program interface (EMS-API)
IEC 61850:2023 - Communication networks and systems for power utility automation
IEC 62325:2018 - Framework for energy market communications
IEC 62351:2023 - Power systems management and associated information exchange - Data and communications security
IEC 62746:2018 - Systems interface between customer energy management system and the power management system
IEC 60870:1989 - Telecontrol equipment and systems

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Switch to sustainable energy sources

- Construction underway on SA's 1st metro-run solar plant – 7 MW PV with 5MW BESS

- Power purchase agreements allow residents and business with AMI meters to sell generated electricity to the City of Cape Town for cash.

- Registering of small scale embedded generation installations:
  - 6899 Grid-tied with 33 MVA exported
  - 1643 off-grid

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Smart Metering

- 1591 AMI meters installed for large power users
- 7904 AMI meters installed for small power users
- 5 AMI meters installed for energy wheeling pilot project

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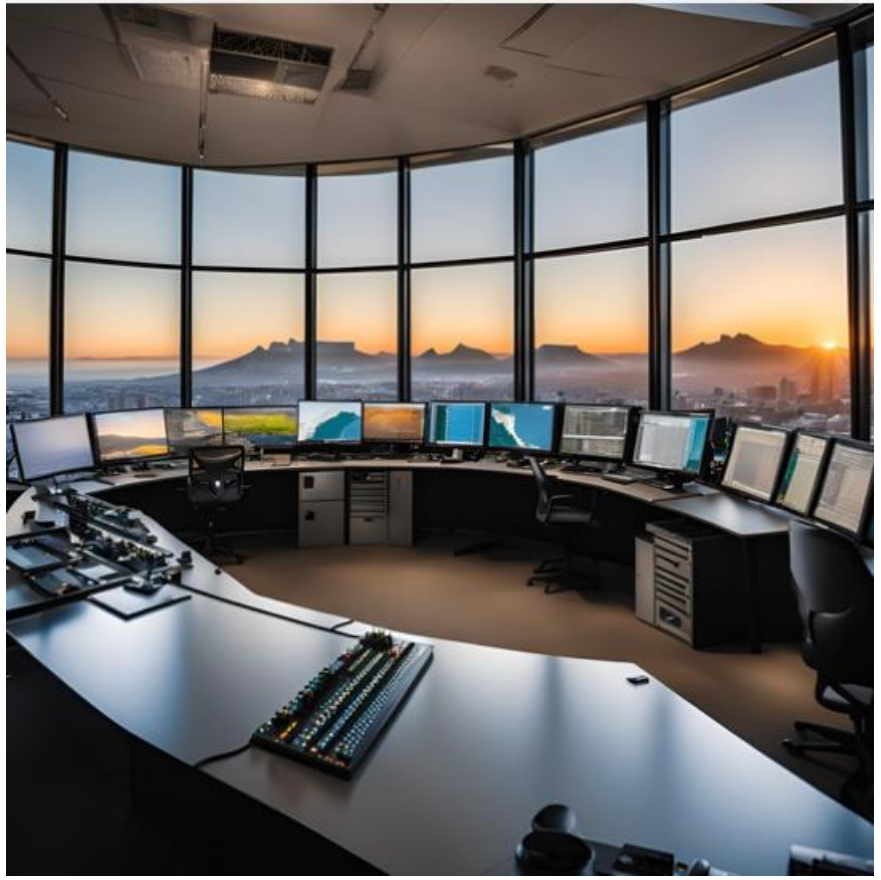
Grid modelling, monitoring and control

- SCADA system upgrades to Advanced Distribution Management (ADMS) underway
  - Outage Management (OMS) implemented in pilot project
  - Sub-station upgrades with more Remote Terminal Units (RTUs)
- Network Model Enhancement
  - Geospatial model upgrade to Network Utility model in Geospatial Information System (GIS)
  - Modelling extended to all supply sources (including SSEG)



Key Points for Success:

- Business objectives need to drive technology selection (not the other way around).
- Business processes and functions are key – you need to know what you do and how you do it before you can do it smarter.
- Build on your strengths – It's better to improve the systems you already have than to buy new ones (more interfaces).
- Priorities change quickly, systems adapt slowly (and expensively).
- Utilities need to invest in IT and data skills and expertise. The need will grow as grid becomes smarter and more complex.
- Data quality will have a major impact on Smart Grid success. Rules and controls need to be in place before applications are implemented.