

In the framework of
SESEI



CENELEC



In association with



Confederation of Indian Industry

3rd Indo-European Conference on Standards and Emerging Technology

26th April, 2018 – New Delhi



MICROGRIDS AND STORAGE

MAKING A RESILIENT GRID

Presented by Sandip Sinha



OVERVIEW

Need for Microgrids and storage



A new energy mix with new applications

Drivers for change in the new world



Remote generation in big plants

- Wind power, esp. offshore
- Hydro power – the Alps, Scandinavia, Canada, China, Brazil



Distributed generation in small units

- Photovoltaic
- Combined heat and power generation



Variable generation

- Wind power
- Solar power



Striving for more efficiency

- Better utilization of infrastructures
- More precise allocation of investments

New applications, e.g.

- E-mobility
- Data centers
- Heating and cooling

Consequences across the system in power generation, transmission, distribution, and consumption. In the end these consequences will require a new system design.

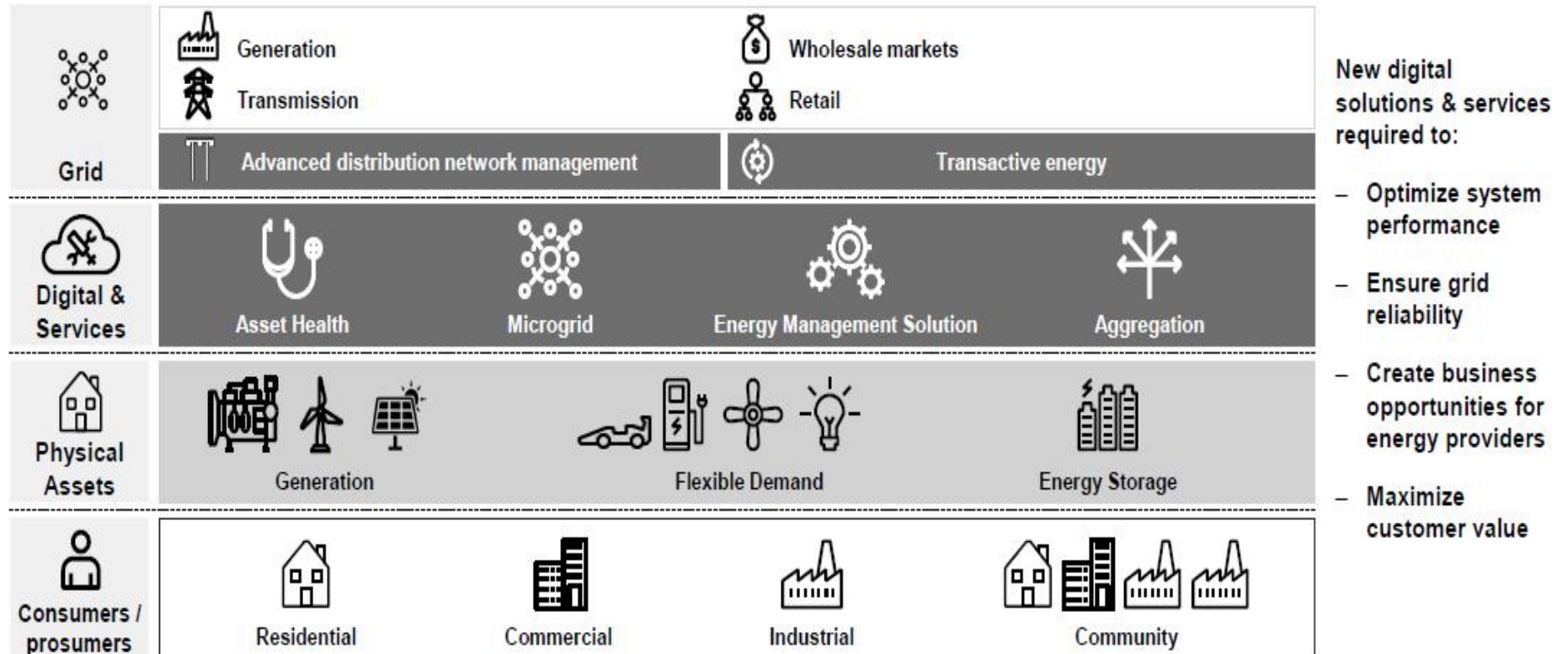
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ABB

Energy and Grid Transformation

New Opportunities for digital solution and services at the edge of the grid



Microgrid – As a concept

Renewable energy – Integrated

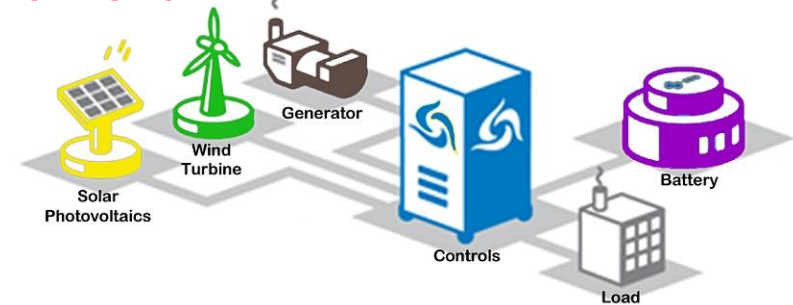


Features (IEEE MicroGrid)

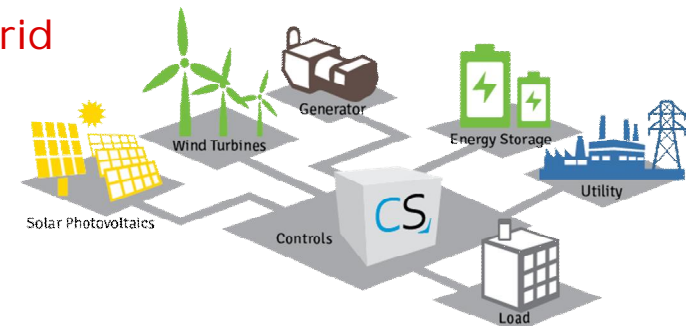
A Smart System with its own generation sources and loads, that interact with the utility grid to ensure optimum operation with uninterrupted supply.

- Multiple Sources
- On- and off-grid operation
- PV (Solar)
- Energy storage
- Grid Integration
- DC & AC integration
- Demand Response
- Source management
- Energy Management System
- Remote capabilities

Off-Grid



On-Grid



Instant power wherever and whenever it is required



For 25 years, ABB has been the leader in microgrid solutions

- Delivering 30+ microgrid installations across the planet, from the coldest and most remote reaches of Antarctica to the searing heat of the Australian Outback
- The most technologically innovative and robust microgrid products and solutions available today – wherever you are
- Allow customers to access to utility grade power, virtually anywhere

Island utilities



Remote communities



Industrial & commercial



Urban communities



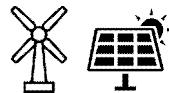
Operational goals, functions drive choice of technology



Operational goals

- Access to electricity
- Maximize reliability
- Uninterrupted supply
- Reduce environmental impact
- Maximize renewable energy contribution
- Fuel & cost savings
- Fuel independence
- Provide grid services

Renewable power



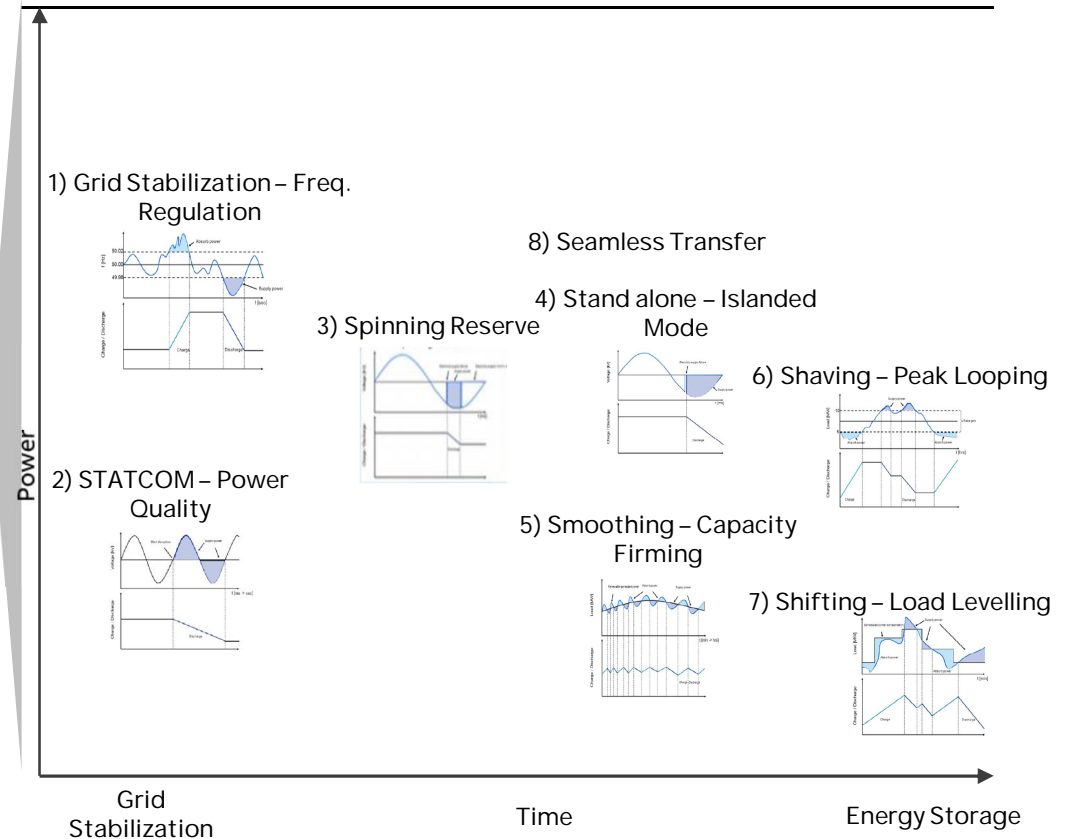
Microgrid control system



Energy storage and grid stabilization

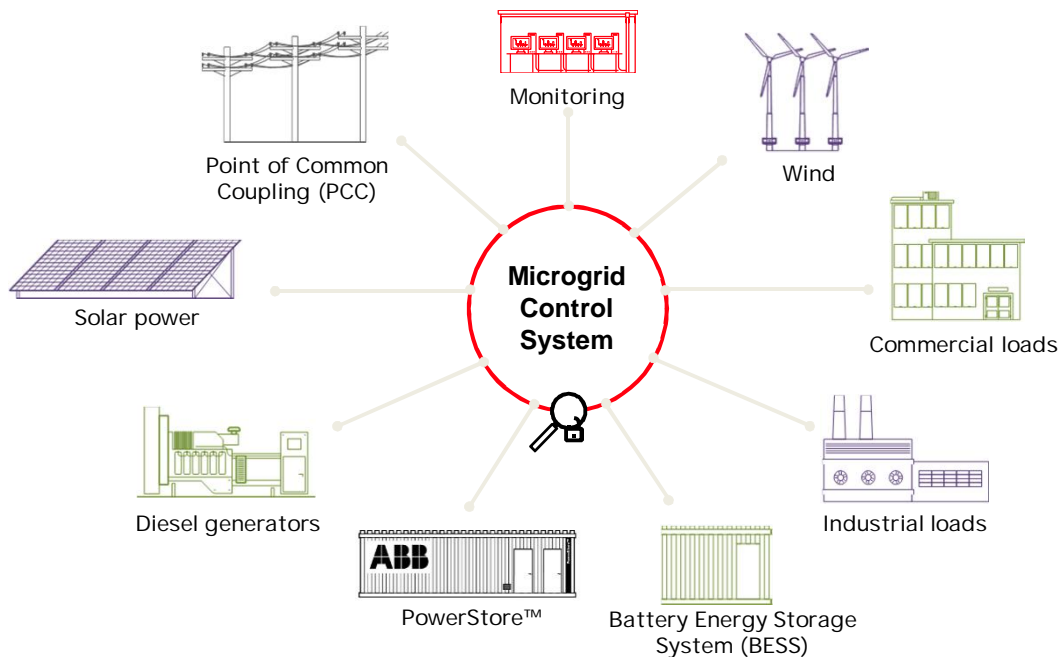


Power system functions – “8S”



PowerStore™ automation

Scalable, flexible, expandable through distributed control



A reliable, modular, containerized “plug and play” solution, available in various ratings with a standardized specification for installation from small remote communities to large industries. It is easily configurable to adapt your unique needs.

Key offering

- Reliable, stable and affordable power availability for both grid connected and off-grid systems
- High penetration of renewable energy into the existing grid together with the control system
- Virtual generator, handling up to 100% of renewable energy
- Optimize the renewable energy generated and reduce fuel cost
- Resilient power that protects against power disruptions of any duration from fractions of a second to prolonged outages
- Standardized products in the range of 60 kW to 5600 kW, scalable unlimited

PowerStore™

“Plug and play” solution, easily configurable to adapt your unique needs

Climate Control

Maintaining temperature inside the container within an acceptable operating limit at all times

Lithium Ion Batteries

Battery module, Racks, and Battery Management System (BMS) Interface

- Easy maintenance
- Online replaceable
- Hot-swappable

PCS100

PowerStore™ Conversion System

- Scalable
- Modular
- Grid Forming
- Virtual Generator

Health Safety and Environment (HSE)

Ensure health and safety appropriateness for all individual components and entire system of PowerStore™

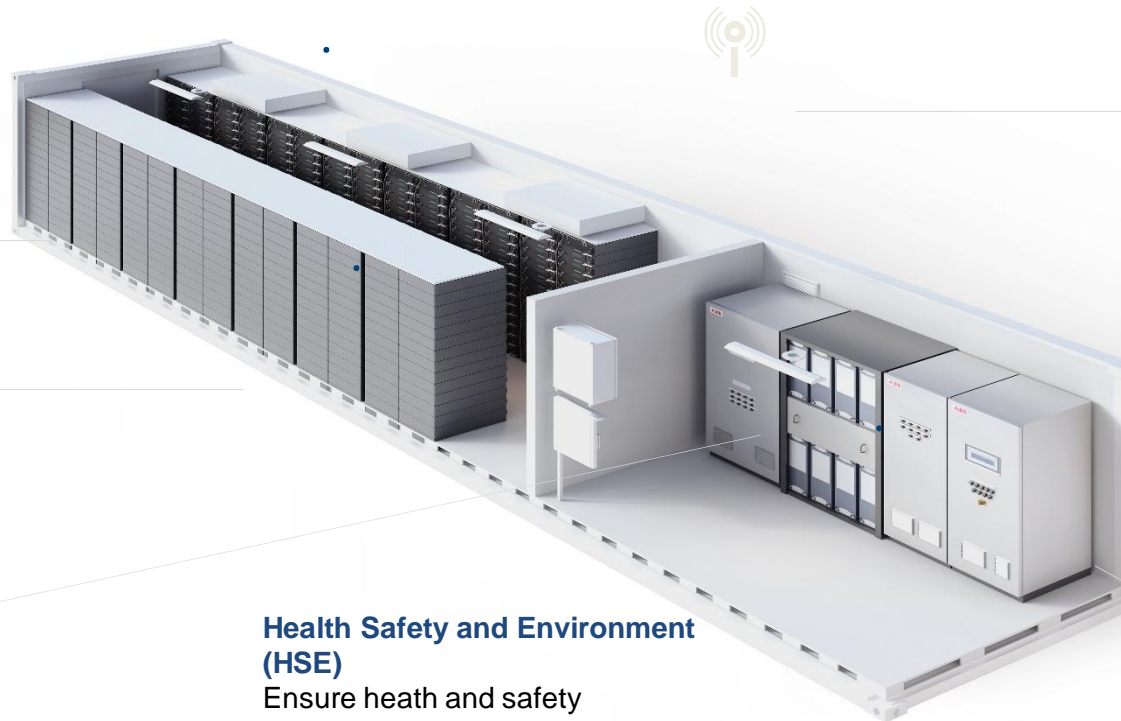
Remote Monitoring

Comprehensive solutions for unattended sites to increase productivity.

- Key Performance Indicators
- Real-time & historical data trends
- Configurable data sampling rate
- Support predictive, preventive and corrective maintenance

Built-in PowerStore™ Automation

Dedicated Microgrid plus control system delivered pre-programmed to meet the application needs

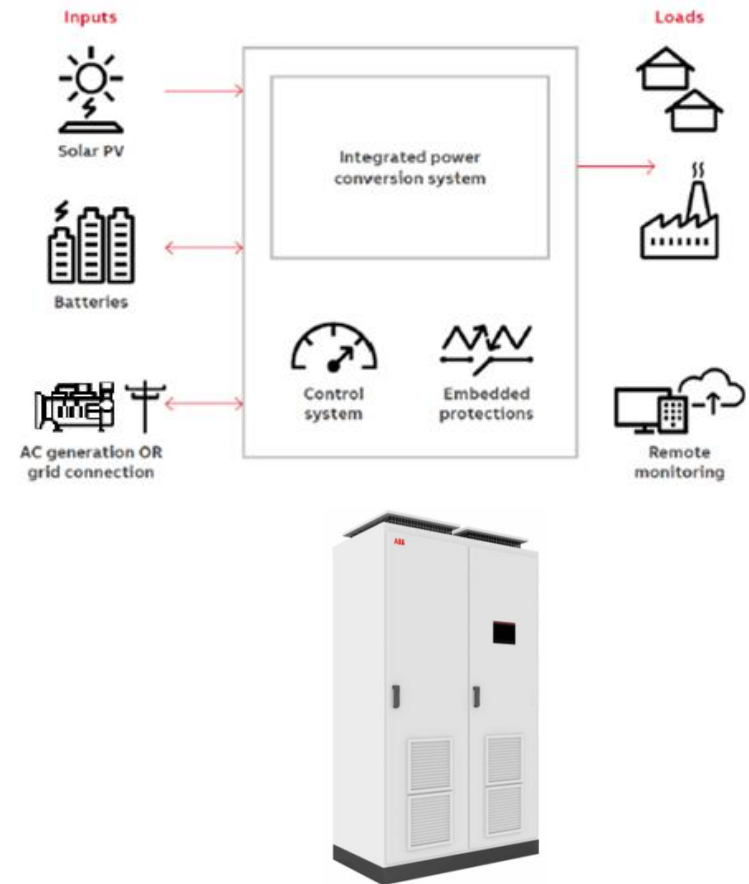


Standalone microgrid system - MGS100

Basic Features

Features

- Single solution supporting
 - On- and off-grid operation
 - Supports AC generators with no backfeed
 - Seamless transition between on- & off-grid operation
 - PV string input
 - Energy storage
 - Lead-acid battery initially
 - Li-ion support coming
- Constructed with proven, highly-rugged ABB products
- Single cabinet construction / container version available
- Full load redundancy operation (optional)

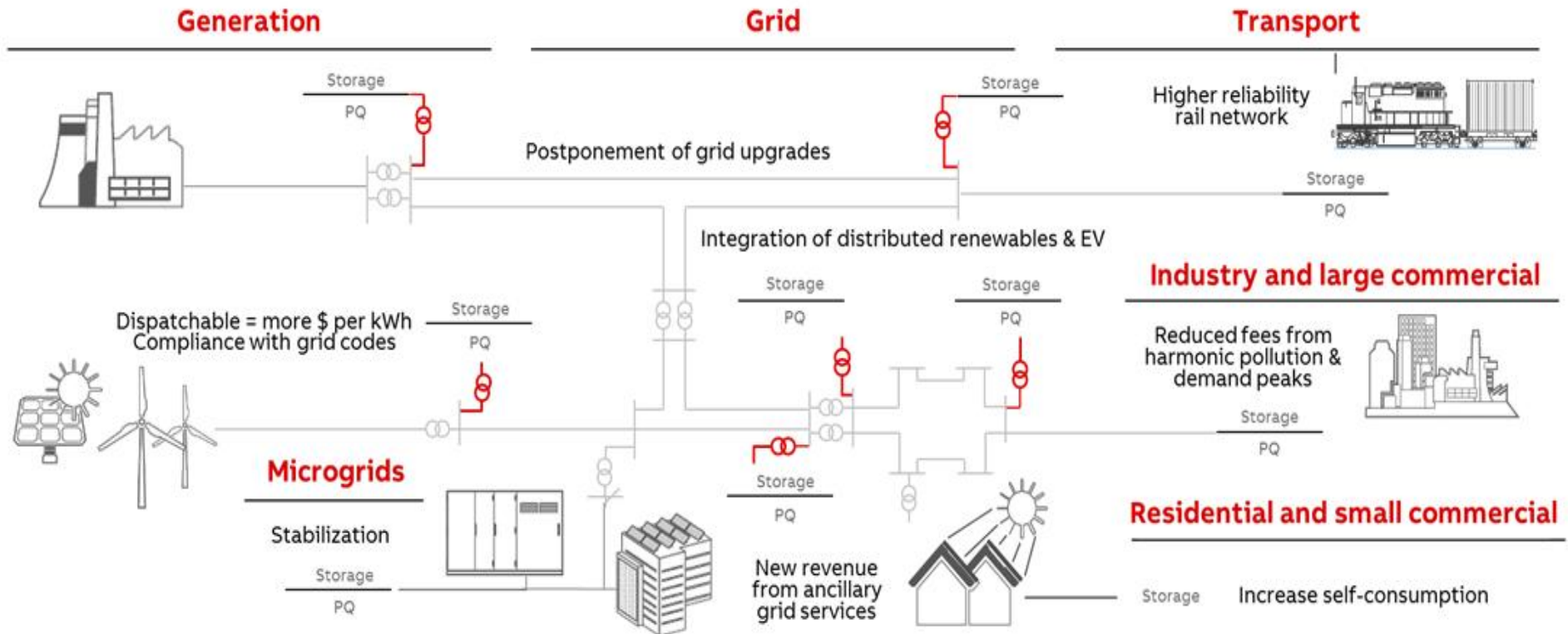


STORAGE

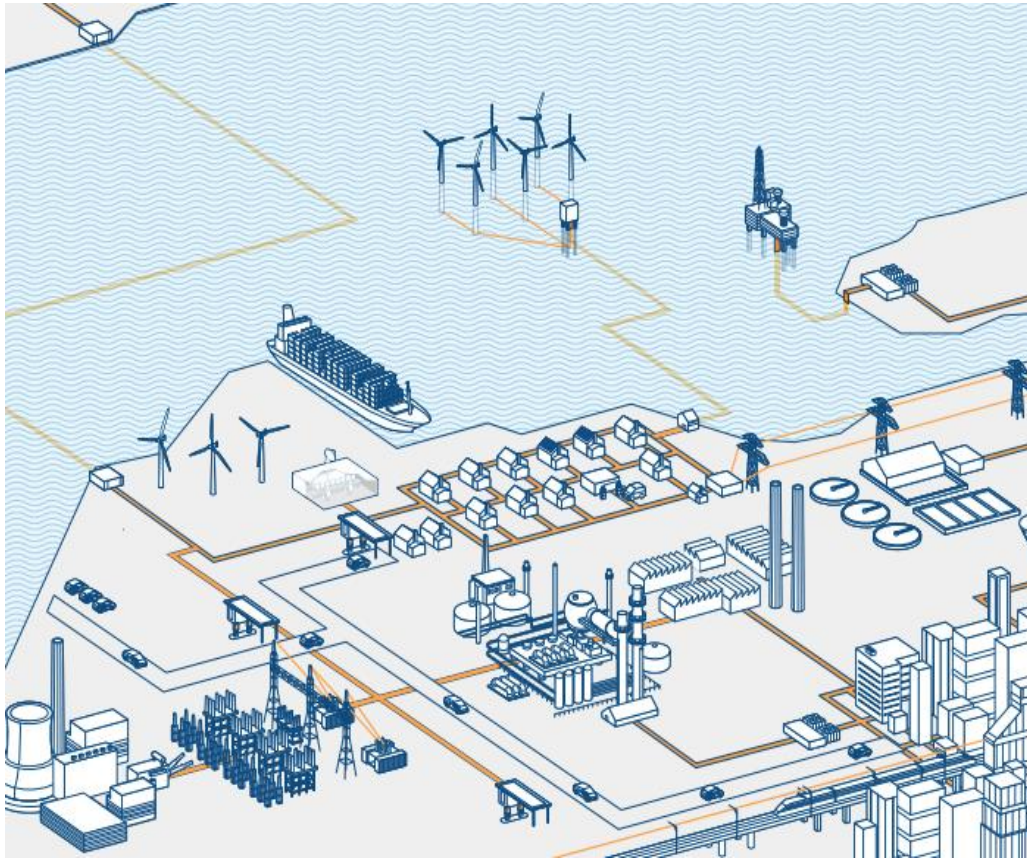


Power systems of the future

Power quality and storage solutions increasingly needed



Long term drivers for storage



- § Wind and solar power
- § Natural gas and oil prices
- § T&D bottlenecks and T&D upgrades
- § Power quality issues
- § Ancillary services
- § Renewables penetration
- § Tools for stability
- § Interconnections
- § Flexible generation
- § Demand-side management
- § Energy storage



THANK YOU

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