

**BUSINESS
FINLAND**

SMART ENERGY

Smart grids

FINLAND



WORLD CLASS EXPERTISE IN ENERGY AND DATA

- Finland has extremely stable electricity grid with minimal losses.
- One of the most advanced smart grid in the world
- Smart grid functionalities such as load profiling, real-time billing, distributed power generation are already in use
- Internationally open Smart Otaniemi and Åland Island test beds for smart grid 2.0
- IoT, connectivity, data analytics and AI piloted at Smart Otaniemi and quickly adopted to power market



5G AND CYBER SECURITY IN ENERGY

- Finnish energy companies have decades of experience and high technical level in protecting from cyber attacks.
- We have common practices in energy industry to restrict cyber threats and to improve cyber safety
- In new digital ecosystem companies, transmission system operators, distribution companies and various service providers are integrating
- Finnish model is field-based approach with joint action groups. The aim is to compile best practices.
- Self-assessment model focused on cybersecurity maturity is currently being piloted among Finnish energy companies, involving Finland's National Emergency Supply Organisation, Traficom and other actors in the sector.

BEST PRACTICES FROM FINLAND

100%

of Finnish households have
real time energy metering

4%

Grid losses totally in
transmission and
distribution networks

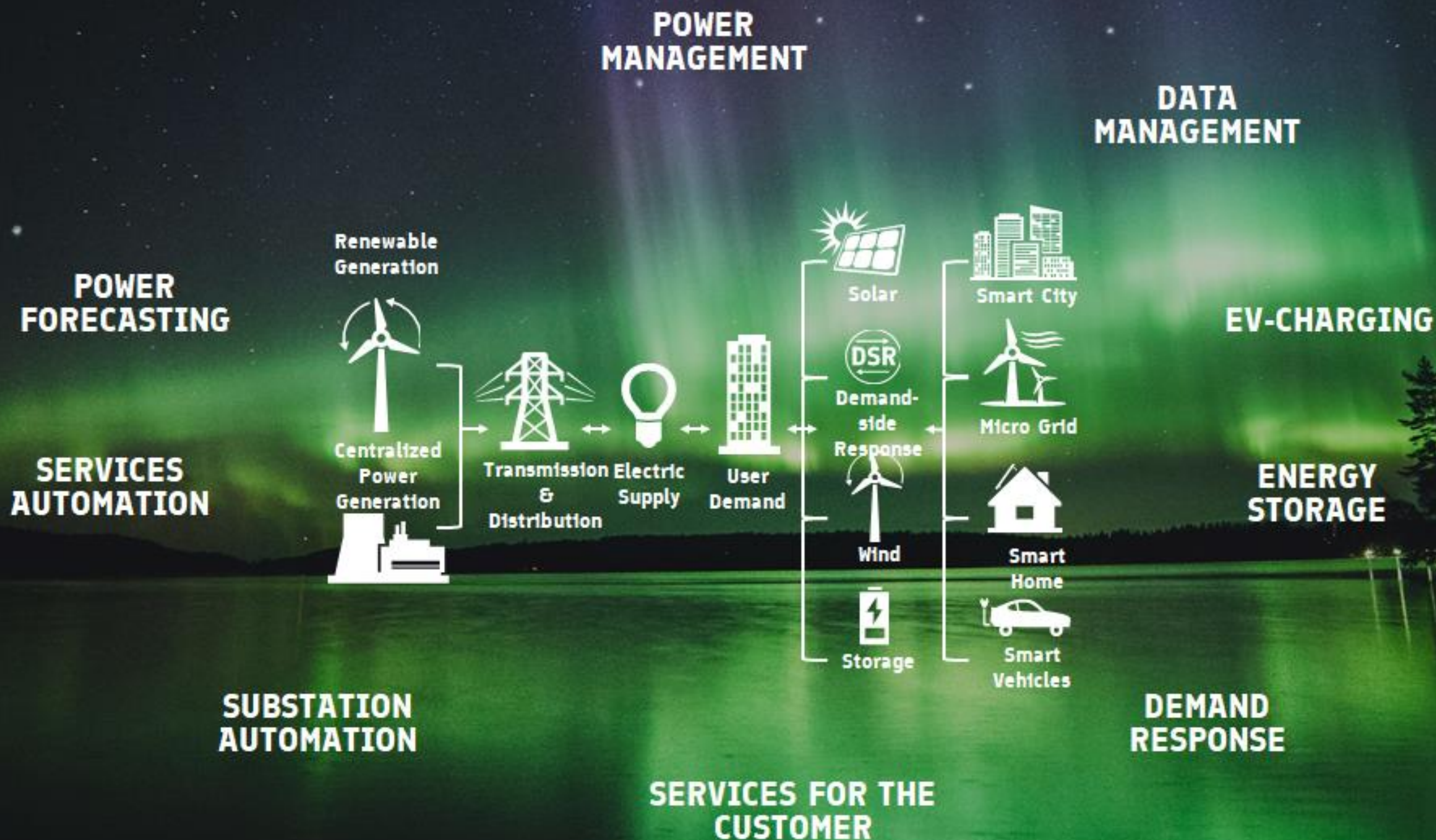
99,9%

99,9998% grid reliability at
transmission lines*

BUSINESS FINLAND

DISTRIBUTION AUTOMATION – ADDING THE FINNISH LAYER TO THE GRID

From traditional to stable, flexible and automated (self learning) grid



POWER MANAGEMENT

Power quality management, radio router for secure data connection.

Power Management Hardware

DATA MANAGEMENT

Cloud based infra, reliable and scalable platform for integration of data points in critical infra, full proved back end system for power data, distributed energy resources management system, secure data connection.

POWER FORECASTING

Distributed energy management system, secure data connection.

SERVICES AUTOMATION

Remote visualisation of maintenance, video feeds between control room and field (security and expert back up), integration of operative applications, physical safety, secure data connection.

EV-CHARGING

Pole connection control, back end system for remote control of poles, measurement of data flow, secure data connection.

High Performance EV-charging

SUBSTATION AUTOMATION

Communication connection to primary substations, monitor and control of secondary substations, secure data connection.

Automation Hardware

ENERGY STORAGE

Connection control, back end system for remote control, measurement of data flow, secure data connection.

Physical energy storage

SERVICES FOR THE CUSTOMER

Create the dashboards and visualisation of the display of the data (from production and consumption) from big customers to the small consumers, tools for data usage and automatic, secure transfer of data for billing dashboards.

DEMAND RESPONSE

Full proved back end system for demand response.

ADDING THE FINNISH LAYER TO THE GRID

RELIABLE DATA & TRANSFER

- Industry leading standards in data transfer
- Utmost reliability in wireless network solutions
- Cyber secure platform for critical functions

POWER QUALITY AND RELIABILITY

- World class hardware to grid harmonization, reliability and balance
- Smart digitalization and automatization

OFF-GRID AND MICROGRID

- Automated microgrid solutions
- Intelligent connection and utilization of renewable energy

STORAGE AND CLEAN ENERGY PRODUCTION

- Innovative short term & long term storage
- Renewable Energy and Back-up Power

MONITORING OF MAINTENANCE AND AUTOMATION SERVICES

- End to end services for digitalized monitoring
- Service digitalization
- Safety and cybersecurity

ADDING THE FINNISH LAYER TO THE GRID

Comprehensive and collaborative approach to Smart Grid (1/2)

VPP and simulations

Flexible grid

Power quality and reliability

Services & maintenance

automation

Energy storage & back up power



ADDING THE FINNISH LAYER TO THE GRID

Comprehensive and collaborative approach to Smart Grid (2/2)

Digitalization & automatization

Energy Efficiency

Connectivity & IoT

Communications

Cyber security

Safety and security, risk management



Mission-Critical Connectivity



EV-CHARGING WITH FINNISH TOUCH

Comprehensive and collaborative approach to charging infrastructure and actors around it

Power Forecasting and connecting to local energy

Power monitoring and control

User Interface

SAAS platform for EV-infra

Safety and security

Planning and simulations

EV-charging HW

Communication and connectivity

Batteries, powertrain and optimization

VTT

REJLERS

EMTELE

echargie

PLUGIT

P
PARKING ENERGY

V VENSUM
THE POWER CONVERSION COMPANY

ENSTO

fortum

+BAMO
MAS-

VIRTA

MIRASYS

IGL
TECHNOLOGIES

Comsel
System

MOVEKO

Wapice

+ KEMPOWER

HARJU ELEKTER

UNIFIE DC CHARGERS

WALL

Haltian

RAMBOLL



WIREPAS

NOKIA

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