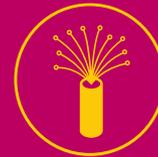


WIENER NETZE

CREATING TOMORROW'S GRIDS.



WIENER NETZE IS AUSTRIA'S LARGEST COMBINED GRID OPERATOR.



Through our network of pipes and cables, we provide electricity, gas, district heating and telecommunications services to **two million customers** in Vienna, parts of Lower Austria and of Burgenland.

In doing so, we help ensure **quality of life** for the people living in the region, as well as the ability to be **competitive**. 24 hours a day, 365 days a year.

Our promise is clear:
“Creating tomorrow’s grids” – one that we keep day in, day out.



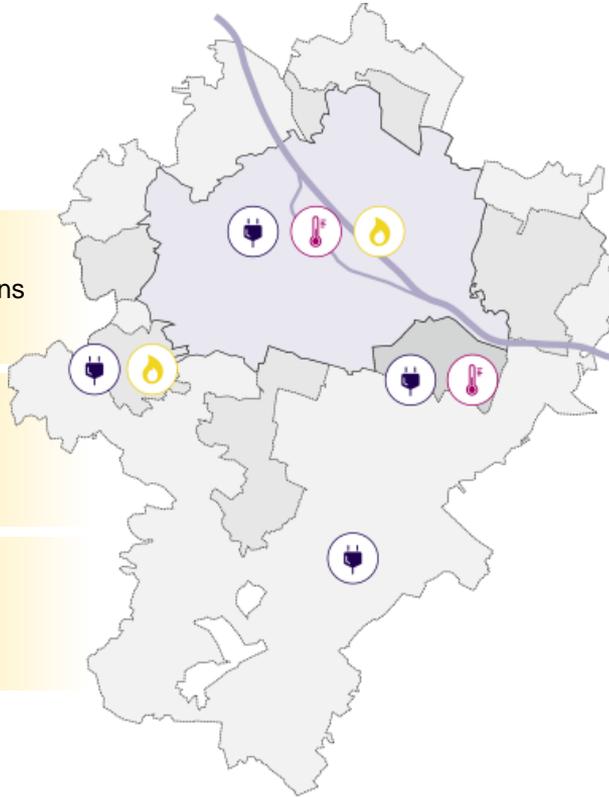
Wiener Netze has been serving people in Vienna and the surrounding area **since 2013**, yet the company's history and that of its predecessors extends as far back as the 19th Century.

OUR SERVICES

46 rectifier substations
11,200 local rectifier substations
1.6 million electricity meters

600 gas pressure regulating stations
650,000 gas meters

550 local converter stations
6,992 shafts (primary network)



GRID STRATEGY, PLANNING AND OPERATION

- Planning, expanding, operating and servicing the electricity, gas, primary district heating and telecommunications grids
- Expanding and servicing the secondary district heating grid on behalf of Wien Energie

GRID CUSTOMER SERVICE

incl. 24/7 service (gas leaks, electricity and district heating faults)

METER AND DATA MANAGEMENT

- Central data hub
- Integrated security management
- Smart metering

GRID SERVICES including the areas of:

- Power switching stations and transformers
- Safety inspections for gas installations
- Real-time positioning (EPOSA)



Aspern Smart City Research

29,95 %

20,0 %

44,1 %

4,66 %

1,29 %



SIEMENS



Project phase 1

Duration: 2013 – 2018

Budget: 38,5' € plus funded projects

R&D Guideline: Define requirements, understand and manage physical effects and their correlation, define and test suitable ICT concepts

Project phase 2

Duration: 2019 – 2024

Budget: 45' € plus funded projects

R&D Guideline: Integration of the results of phase 1 into seamless operation concepts & integration of e-mobility, storage and multimodal concepts (electricity & heat)

ASCR TESTBED SMART BUILDING

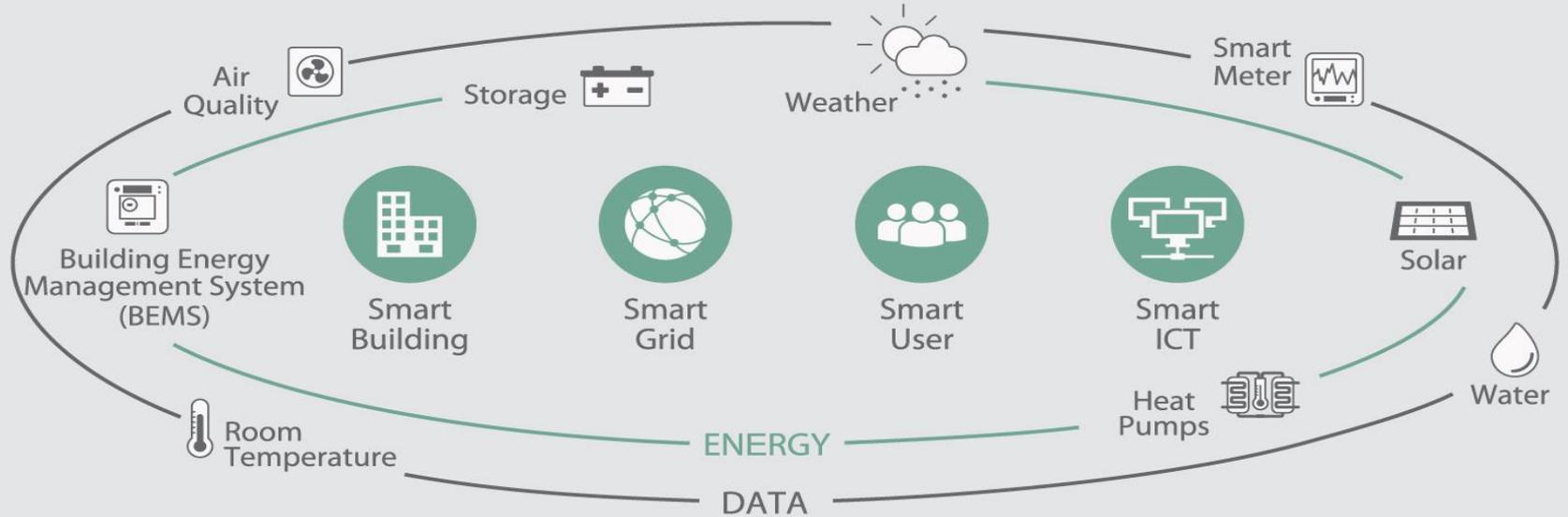


- 1 Student hostel (300 students)
- 2 Apartment building (213 apartments)
- 3 School campus
- 4 Parking garage
- 5 Technology Center

Available building infrastructure
HT & LT heat-pumps, PV panels, solar-thermal panels, thermal storages (hot water tanks, ground storage), batteries

Parking garage
AC and DC chargers, battery, PV panels

OVERVIEW OF THE ASCR RESEARCH FIELDS



OPTIMAL HARMONISATION OF:

GENERATION ✓

DISTRIBUTION ✓

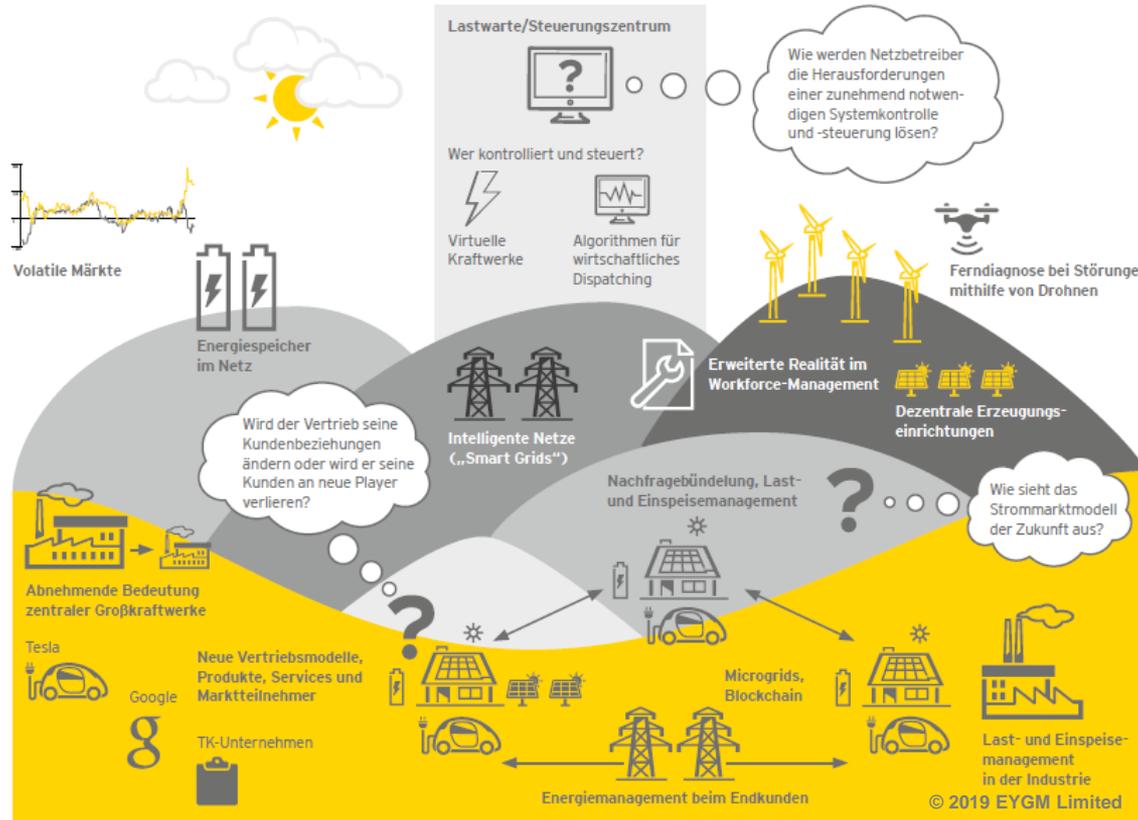
STORAGE ✓

CONSUMPTION ✓

ENERGY EFFICIENCY



E-XITING – DIGITALISATION DEMANDS FÜR DSO



Auch die globale Energiewirtschaft befindet sich in einem radikalen Wandel

Erzeuger, Verteilnetze und Verbraucher werden miteinander verbunden, was zu erhöhter Komplexität und Matrix-Interaktionen führt und neue Geschäftsmodelle vorantreibt.

5 Milliarden
Internet Users
2020

Quelle: The Future of the Internet — 7 Big Predictions of 2020, Dospeedtest.com

3 Trillion
IP Geräte
2030

Quelle: Cisco (50 Billion by 2020) and Morgan Stanley (75 Billion by 2020), GE Estimate

400 Millionen
Elektroautos
2040

Quelle: BNEF global EV sales forecast by geography, 2015– 2040, Bloomberg New Energy Finance, 02/23/16, GE Estimate

50%
Reduktion in CO₂
2050

Quelle: European Commission — Climate Action

800%
Anstieg in Erneuerbare Energieproduktion
2035

Quelle BNEF global EV sales forecast by geography, 2015– 2040, Bloomberg New Energy Finance, 02/23/16, GE Estimate

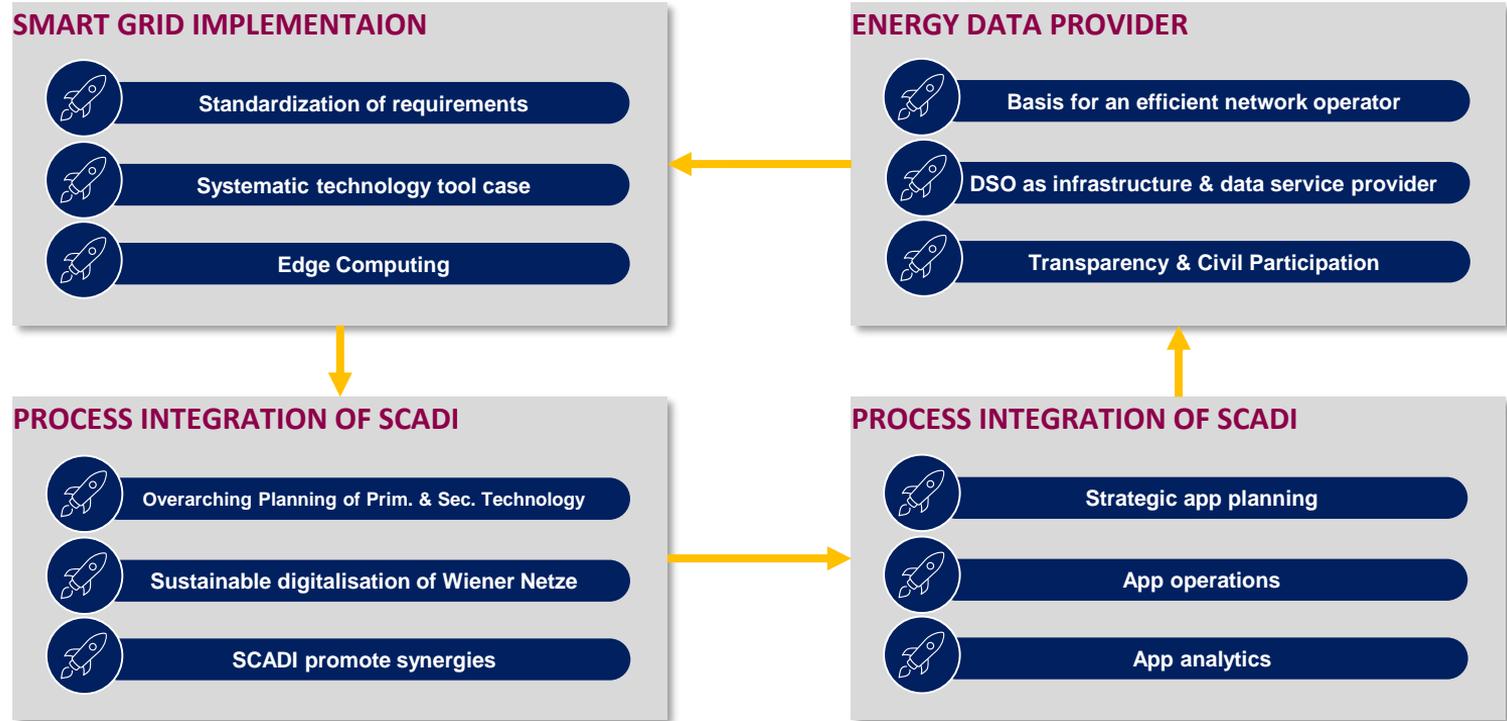


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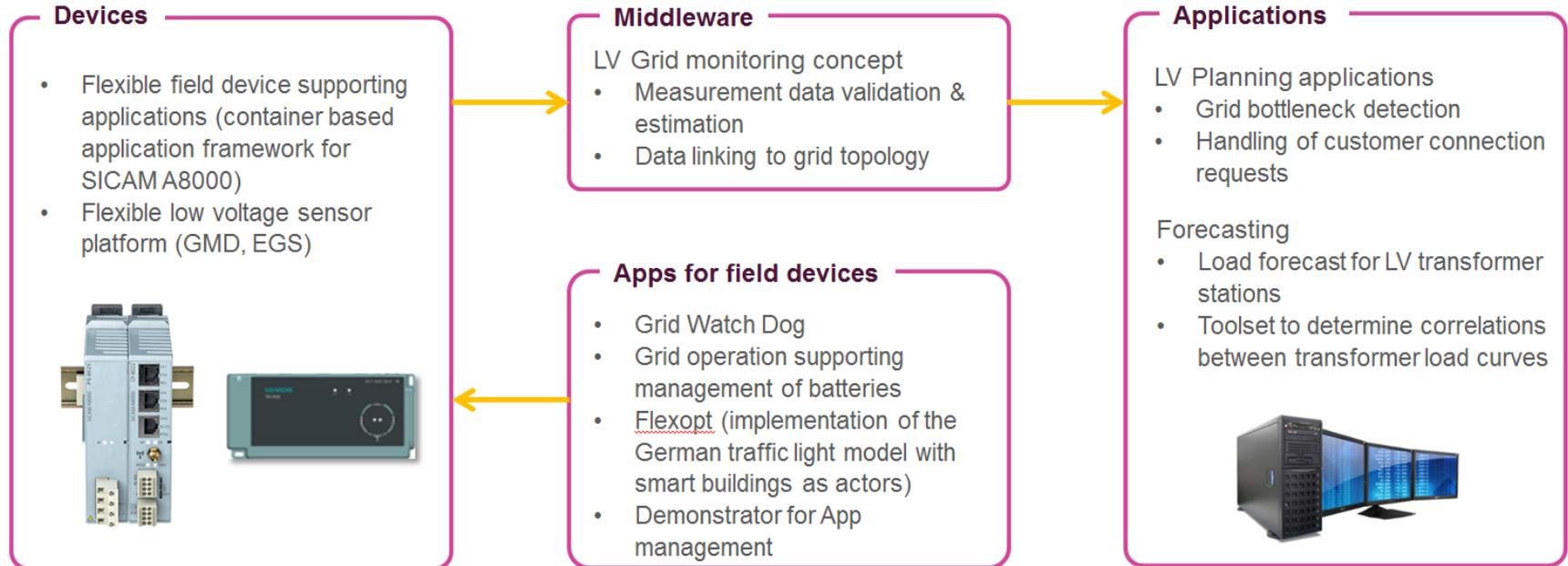
E-XITING – ENERGY COMMUNITIES



LOW VOLTAGE GID DIGITALISATION

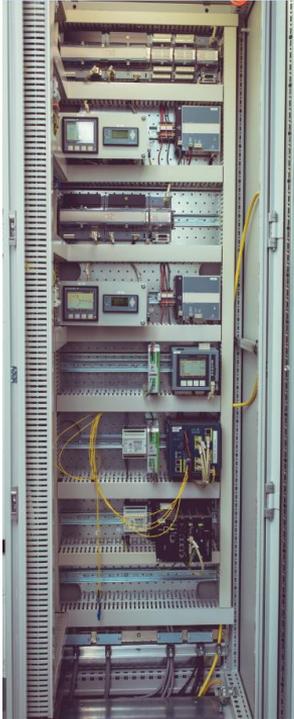


SMART LOW VOLTAGE GRID ECO SYSTEM



LOW VOLTAGE GRID TOOL CASE

Beginning ASCR 1.0



End ASCR 1.0

A 8000



Platform for applications in the field

SGW 1050



Smart Meter Gateway

GMD



Sensor for low voltage applications

Q200



Power quality measurement (bis 150kHz)

FIELD COMPONENT TOOL CASE

Transformer station – „Type 1“



Transformer station with measured values transmission and / or local measurement (not calibrated)

Transformer station – „Type 2“ [WN: „B“]



Transformer station with measured values transmission and SM data concentrator

Transformer station – „Type 3“ [WN: „C“]



Transformer station with measured values transmission, SM data concentrator and a platform for local app's (control and monitoring functions) ie A8000, CP8050

Transformer station – „Type 4“



Transformer station with measured values transmission, SM data concentrator, a platform for local apps (control, monitoring and monitoring functions) and integration of third-party products and power quality measurement

LOW VOLTAGE GRID ARCHITECTURE

Central ICT-INFRASTRUCTURE

Smart Metering
Record counter values
Metering infrastructure

Control Centers
Operations / Monitoring
SCADA systems

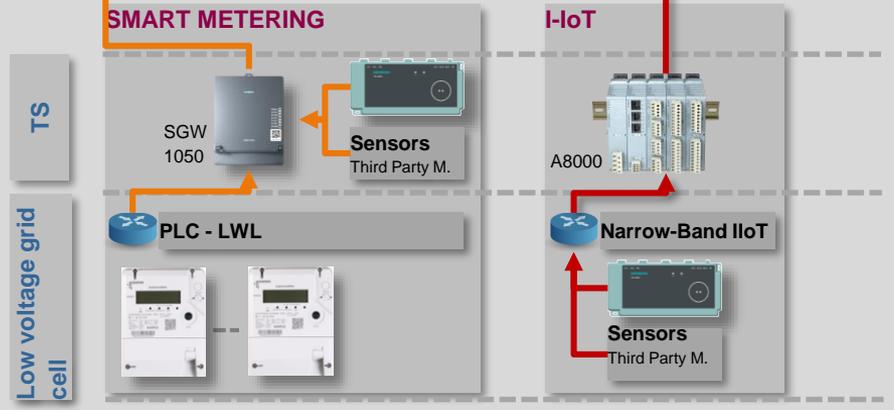
OT
Network Optimization / -
Planning - Backend IT

GIS
Asset localization
GIS infrastructure

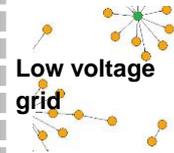
**Smart Metering-Network
Wiener Netze**

**Operating communications
network Wiener Netze**

FIELD COMPONENT TOOL CASE



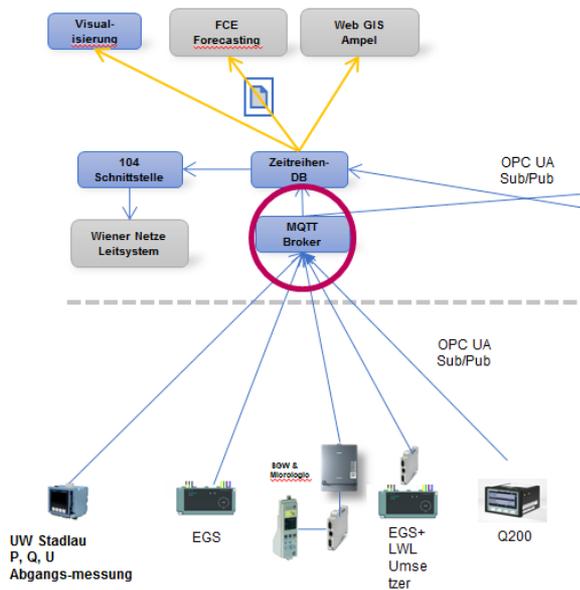
Main substations



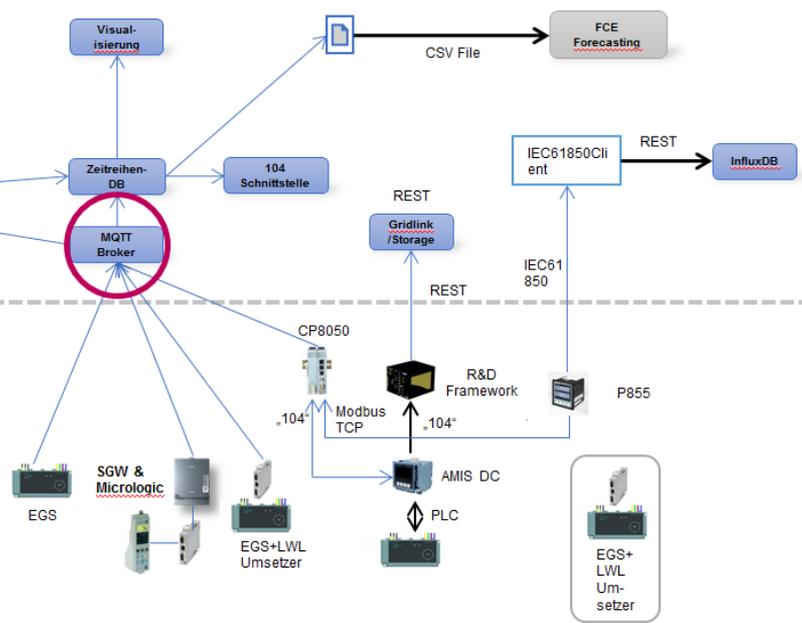
— real-time data
— Non real-time data

FIELD DEVICE CONNECTIVITY

WN Zentrale



ASCR Zentrale



Erweitertes Testbed

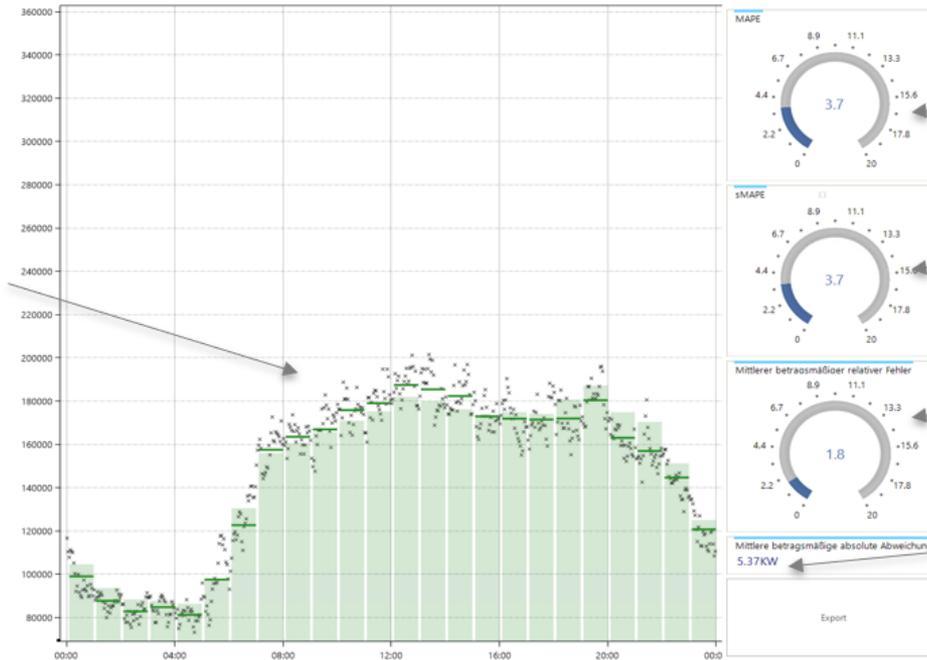
ASCR Testbed

ENERGY DEMAND FORECAST OF TRANSFORMER STATIONS

Prognoseleistung
(hellgrüne Balken)

Istwerte
(schwarzen Punkte)

stündlichen
Leistungsmittelwerte
(dunkelgrüne Linien)



MAPE =
Mean Average Percental Error

sMAPE =
symmetrical Mean Average Percental Error

Mittlerer betragsmäßiger relativer Fehler

Mittlere betragsmäßige absolute Abweichung (in kW)

- ✓ **ZIEL: Prognoseergebnis der Energiebedarfsprognose pro Ortsnetzknotten (Wirkleistung) hinreichend genau**
- ✓ **ZIEL: Prognose-Cockpit als User-freundliche Anwendung geschaffen (direkte Darstellung der Prognosegüte!)**



Dipl.Wirtsch.Ing.(BA)

Roman A. Tobler, MA

Digitale Information und IKT-Governance | Abteilungsleiter
ISO 27001 Lead Auditor | CISA - Certified Information Systems Auditor
CISM - Certified Information Security Manager

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