Demand Side Management with G3

A cost-efficient solution for DSOs

Peter Müller

127 Years of Excellence

Global Reach & Local Presence Swiss HQ with Locations **in over 30 countries**

7,750 dedicated employees globally

126 YEARS of services to **3,500+ customers** as a trusted partner

Frost & Sullivan **Global AMI Company of the Year 2022** 6th consecutive year

Largest installed base **320+ million** devices: o/w 130+ million connected intelligent devices

Over **9.5 million tons of CO_2 emission** avoided through installed smart meter base

More than **20 million meter points** under managed services

Worldwide largest **IoT Utility Network** 1.3 billion reads per day with 99.99% accuracy

Over 9.5 million tons of CO_2 saved by Landis+Gyr devices each year

Landis+Gyr

Our Mission

At Landis+Gyr, we create a greener tomorrow through leading smart metering, grid edge intelligence and smart infrastructure technology.

As partners, we empower customers and consumers to utilize resources in a more informed and sustainable way.

Together, we manage energy better.

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Challenges and current situation in the grid

DSOs are called to integrate DER and EVs ...

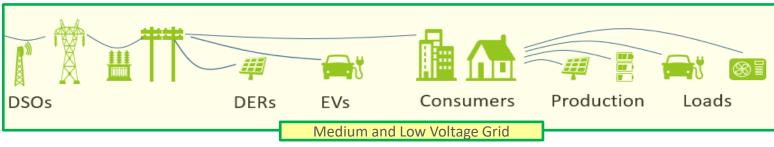... without disrupting grid operation (keep SAIDI/SAIFI low)
... with minimum additional cost (CAPEX & OPEX)

Enormous increase of **peak load mainly driven by EVs**

Increased **Distributed Energy Resources** leading to unreliable power supply

Unpredictable **renewables** to be integrated **cost-efficiently** into the network

Generators TSOs

DSOs   DERs   EVs   Consumers   Production   Loads

Medium and Low Voltage Grid

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Huge delays in integrating renewables & EV

Revised legislation "Fit-for-55" raises EU's renewable energy target from 32% to 40% by 2030.

This means **209 GW additional solar capacity** to be installed by 2030.

"We reject about 30% of new PV connection requests due to over-voltages on LV grid."

Asset manager, Elektro Ljubljana, Slovenia

Congestions combined with lack of technical staff for network upgrades are slowing down our renewable energy resources integration. There must be another way to solve this!

SCADA manager, Alliander, Netherlands

Clustered small generation units with no control capabilities are causing high voltage fluctuations, posing a problem for the network and distribution transformers.

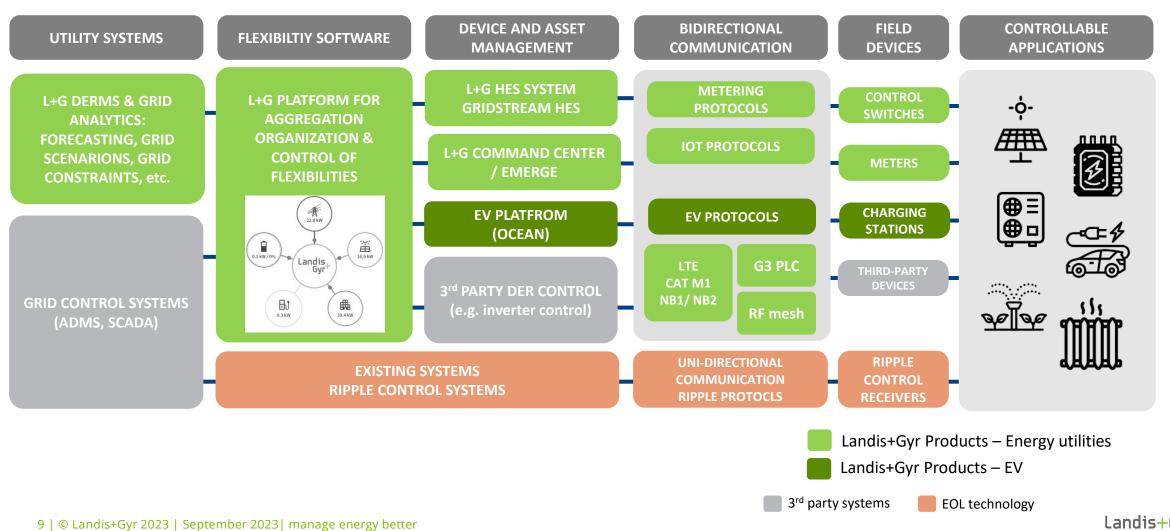*Grid operations, Enefit, Estonia*

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Demand Side Management is the solution

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GridFlex Control: Demand Side Management

A platform to enable Energy Transition

UTILITY SYSTEMS	FLEXIBILTIY SOFTWARE	DEVICE AND ASSET MANAGEMENT	BIDIRECTIONAL COMMUNICATION	FIELD DEVICES	CONTROLLABLE APPLICATIONS

L+G DERMS & GRID ANALYTICS: FORECASTING, GRID SCENARIONS, GRID CONSTRAINTS, etc.

L+G PLATFORM FOR AGGREGATION ORGANIZATION & CONTROL OF FLEXIBILITIES

L+G HES SYSTEM GRIDSTREAM HES

L+G COMMAND CENTER / EMERGE

EV PLATFROM (OCEAN)

3rd PARTY DER CONTROL (e.g. inverter control)

METERING PROTOCOLS

IOT PROTOCOLS

EV PROTOCOLS

LTE CAT M1 NB1/ NB2

G3 PLC

RF mesh

CONTROL SWITCHES

METERS

CHARGING STATIONS

THIRD-PARTY DEVICES

GRID CONTROL SYSTEMS (ADMS, SCADA)

EXISTING SYSTEMS RIPPLE CONTROL SYSTEMS

UNI-DIRECTIONAL COMMUNICATION RIPPLE PROTOCLS

RIPPLE CONTROL RECEIVERS

■ Landis+Gyr Products – Energy utilities

■ Landis+Gyr Products – EV

■ 3rd party systems   ■ EOL technology

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L540 Control Switch for grid flexibility management

L540 is a G3-PLC switching device supporting demand- & supply-side flexibility applications for optimal operation of the distribution grid.

- Control of decentralized loads, generation and storage appliances

- High operational reliability thanks combined central and distributed switching intelligence

- High installation friendliness and configuration flexibility

- Fully integrated in Landis+Gyr Gridstream solution

10

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GridFlex Control: Success story with PLC G3

Demand Side Management over Advanced Metering Infrastructure (AMI)

CONTROLLABLE ASSETS

- Water boilers
- Direct and night storage heaters
- Heat pumps
- Ventilation and air conditioning systems
- E-charging stations
- Photovoltaic inverters
- Thermal & electrical storage

GRID OPERATION

- Optimized use of grid infrastructure
- Load balancing
- Peak load reduction
- Influencing the load curve
- Congestion management
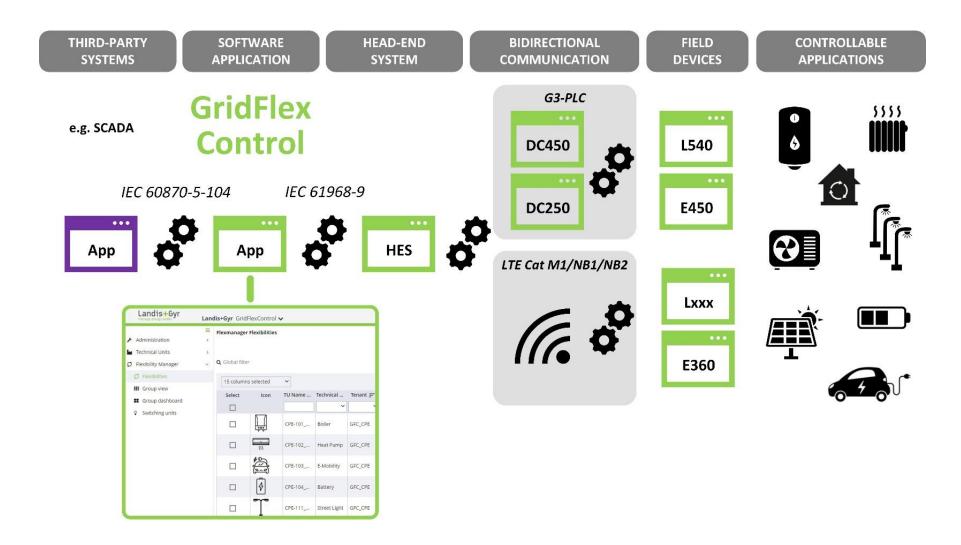- Integrating EV and decentralized renewable energy sources

SERVICES

- Public lighting
- Optimization of self-consumption (Prosumers)

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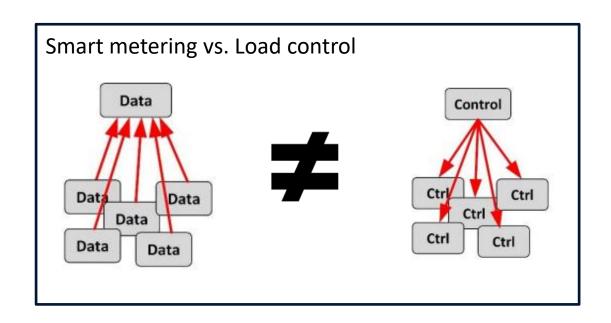
GridFlex Control: Success story with PLC G3
End-to-End architecture with G3 PLC

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GridFlex Control: Success story Switzerland
Lessons learnt

Demand Side Management over PLC G3 is a cost-efficient and well performing option but, must be designed and developed as an end-to-end solution to achieve the required performance, reliability and security.

Smart metering vs. Load control

- **Spontaneous commands** need to be prioritized to avoid grid congestions
- **PLC clean up** is a requirement to achieve grid operation SLAs
- **Response** back to the system enables better grid management
- **Dynamic schedules** need to be implemented at the edge for the system to function also without connectivity
- **End-to-end solution architecture** needs to be defined considering every single use case and respective SLAs
- **End-to-end optimization** is required to ensure performance and reliability of the solution for Demand Side Management

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