Digitization to create transparency in the distribution network

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The well-known issue of electrical heaters might cause severe issues in the winter

**Sale of electric heaters in Germany surges amid gas shortage fears**

Germany has seen a huge rise in sales of electric heaters as the winter draws nearer. Many fear there will not be enough gas around to heat homes.


**How Millions Of ‘Cheap’ Electric Heaters Could Crush Germany’s Power Grid**

By Zvonko Jeljeg. - Sep 13, 2022. 12:00 PM CDT


**Angst vor Blackouts**

Netzagentur warnt vor Heizlütern im Winter


10.09.2022; 23.11 Uhr

Spiegel Online

**Hamsterkaufe für den Winter**

Teure Heizlüfter verschärfen Gasmangel


23.09.2022; 15:12 Uhr

Spiegel Online
On higher voltage levels, a lack of grid capacity is not a new problem…

Feed-in curtailment in Germany (EinsMan) over the past four years

Source: BNetzA (2022)
Redispatch 2.0 was introduced to address this issue

Since October 2021, distribution system operators are to be given a new role in the elimination or avoidance of grid bottlenecks (redispatch) and are to be actively involved in the process.

**Basis**
Netzausbaubeschleunigungsgesetz (NABEG) from May 13th 2019

**New billing processes**
- For financial compensation
- Loss of electricity production per plant
- Between DSO & BTR

**Advanced balancing processes**
- Adjustments to all market roles
- Balance sheet adjustment
- New redispatch balancing group

**Affected**
- All EEG & CHP plants > 100kW
- All remote controllable plants < 100kW
- In planning: lowering the plant size to 50kW or even 30kW

**New market roles emerge**
- EIV – “Einsatzverantwortlicher“ = Responsible for operations

**New responsibilities for the DSO**
- Predictive network condition analysis
- Forecast & elimination of network bottlenecks
- Coordination with neighboring and upstream NBs
- Financial balance sheet compensation for redispatch measures
Major parts of the low voltage grid are still a blind spot for grid operators in Germany

DSO/DNO view today

With an increasing decentralized and complex energy grid, there is a need to gain greater insight and control in the medium and lower voltage grids in order to efficiently combine the sectors electricity, heat, and mobility (sector coupling).
SCADA systems are designed for safe operation with highly reliable, redundant data.

[Diagram showing costs and grid measurement levels with SCADA highlighted and localized solution mentioned for limited grid measurement.]
An approach to allow for grid transparency with only limited data measurements

1. Creation of Digital twin
   - Models as input

2. Integration of realtime measurements and weather data
   - Dashboard of Measure

Use cases:
- Monitoring
- Forecasting
- Control
- Planning
- Analytics

Real-world steering
An approach to allow for grid transparency with only limited data measurements

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Use cases:
- Monitoring
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Real world steering
- Quality increase with increasing amount of data

Base data:
- GIS
- Asset data
- EDM
- Grid Calc

Dynamic data:
- Aggregators
- SCADA
- Measurements
- Weather data

Quality increase with improvement of measurement equipment
Visualization as one key to give full transparency over the grid status
Upcoming challenges for grid transparency

**Short-term**
- Usage of electrical heaters in the winter season 2022/23 yet unclear
- Possible shifts in electricity consumption share between industry, commercial and residential sector due to extreme electricity prices

**Medium-term**
- An increase of short term price elasticity of consumers will challenge SLP assumption fundamentally
- New transparency and process requirements for DSOs according to § 8 EEG and §14e EnWG
- Modelling of increasing EV penetration and (fast) charging behavior

**Long-term**
- Flexibility markets for the DSOs?
- Sector coupling – Combined Modelling of heat, gas, electricity and transportation networks
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