Mastering the challenges of future utility telecommunication networks

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1. Today’s energy system challenges
2. Energy Transition and telecommunication
3. Solution approach for telecommunication
4. Conclusion
Mega trends in the energy system change our business fundamentally and irreversibly

Today’s challenges

Centralized structures → Decentralized structures
Low ICT usage → High pervasion of ICT
Low usage of measurement → Detailed measurement required
Proprietary solutions → Open standards
Standard IT security → Very high level of ICT security
Energy transition and the role of telecommunication
Decentralization and digitization shape the energy system of the future.
The energy transition takes place in the distribution grid and requires additional telecommunication services.
The ICT environment of today’s energy world is no longer a communications island: It is interconnected with external partners and processes.

**Role of telecommunication**

**Weather data**
- Wind
- Solar radiation
- Temperature

**RES (Wind & PV)**
- Control and cut off
- Generation data

**Communication with external parties**
- TSO
- Municipal utilities

**Reporting requirements**
- Transparency of information flow
- Recognition of possible intrusion patterns

**Advances in IT Security technology**
- Intrusion Detection
- Analysis of application layer

**Increasing usage of IP technology in the process network**
- Grid control center
- Backbone + distribution

**Likelihood of threats to energy systems is increasing**
- Utilities increasingly get into the focus of attackers

**Next Generation ICT security solutions**
3
A solution approach for the next decade
Solution approach

Matching power distribution grid and the utility telecommunication network reveals missing links.
Each communication technology option for the medium and low voltage levels has specific challenges

Grid topology Germany

- Medium voltage grid ~500,000 km
- Low voltage grid ~1,000,000 km

Technology options

- Fiber
- Power line
- Radio based
Development of the telecommunication technology mix for the medium and low voltage levels of the smart distribution grid

Solution approach

Utility dedicated radio LTE
- Quality of Service
- Blackout resilience

5G radio services

Public mobile 4G LTE 800
- Quality of Service
- Narrowband LTE

Internet fixed lines DSL

Renewable Energy growth

Blackout resilience required

Today 2020+ 2050
The use of a combination of standard telecommunication services improves service availability at reasonable cost.

Solution approach

End-to-end solution: M2M Secure Access
The financial perspective: Future distribution grids require ICT and financial backing by regulation schemes (Example Germany)

Value added via ICT

2025 ca. 150 Mio € p.a. for ICT

Source: Moderne Verteilernetze für Deutschland, Abb. 55: Jährliche Zusatzkosten durch Erzeugungsmanagement in der Netzplanung (Szenario EEG 2014), Verteilernetzstudie im Auftrag des BMWi, Berlin, September 2014
Conclusion
Conclusion

Implement a scalable IP platform
• Basis for all future services
• Scalable architecture
• Real-time and non-real-time
• Built-in blackout resilience

Implement state-of-the-art ICT-Security solutions
• Security certification of DSO’s in GER
• Next Generation Firewalls
• SCADA network monitoring

Telecommunication solutions for MV and LV
• Public mobile
• Public fixed line
• Complementary power line
• Future utility specific solutions

Keep your team curious and hungry for innovation
• Show the way – not the solution
• Empowering people
• Business integrated project teams
Thank you!

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