



EUROPEAN STANDARDS ORGANISATIONS

Smart Meters Coordination Group

# Common functional communications standards for smart metering systems

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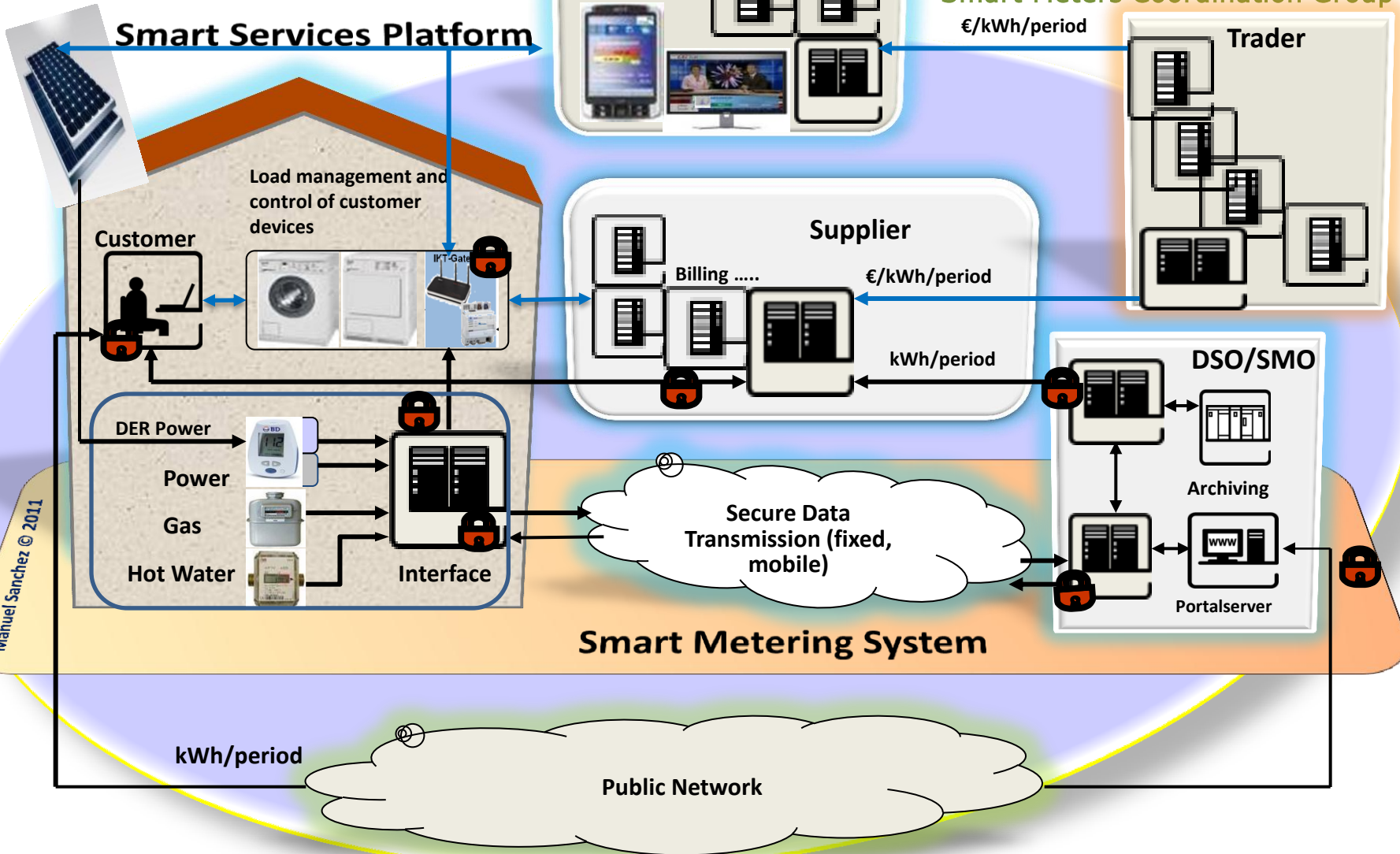
CEN-CENELEC-ETSI Smart Meters Coordination Group

- Legislative background
- Mandate M/441: objective, organisation and remarks
- Reference Architecture
- Additional Functionalities
- Use Cases
- Link with Smart Grids
- Privacy and Security
- Deliverables
- Conclusion

Introduction of intelligent (or smart) metering systems is promoted and facilitated by the European Union through legislation:

- Directive on Measuring Instruments (2004/22/EC)
- Directive on Energy End-use Efficiency and Energy Services (2006/32/EC)
- Standardization mandate M/441 (March 2009) on the development of an open communication architecture for utility meters
- Third Energy Package – Directives 2009/72/EC and 2009/73/EC  
→ provisions on 'intelligent metering' in electricity and gas
- Directive on Energy Efficiency (2012/27/EU)

# Smart Metering System



# Mandate M/441 - Objectives

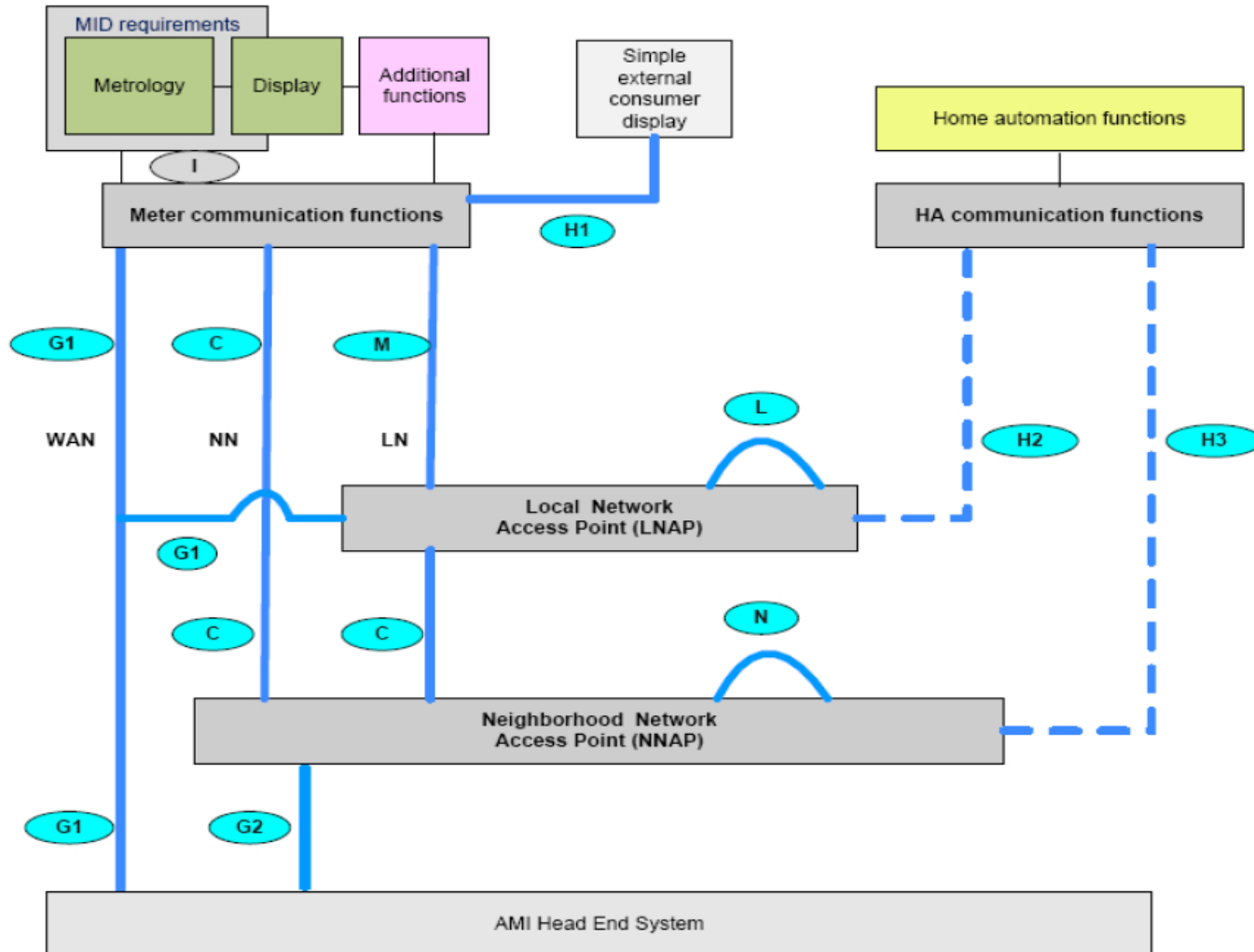
- To improve customer awareness of actual consumption in order to allow timely adaptation to their demands
- By means of:
  - European standards allowing **interoperability** of utility meters (for electricity, gas, water and heat)
  - Fully integrated solutions, modular and multi-part solutions
  - **Architecture** must be scalable and adaptable to future communications media
  - **Secure data exchange**

# Mandate M/441 - Organisation

- M/441 formally accepted by the European Standards Organisations in July 2009
- Formation of CEN-CENELEC-ETSI Smart Meter Coordination Group and relevant sub-groups:
  - All stakeholders represented: Energy Regulators, Industry, Manufacturers, Consumers....
  - Benefit to be taken from the existing standardization activities

- In this context, standardization **does not mean imposing identical solutions** on all projects in European Member States
- Aim is to ensure that what a European Member State may want to do in smart metering is covered by suitable standards: **toolbox concept**
- **Does not cover 'back office'** or other industry IT systems impacted by smart meters but work will have implications
- Standards for communications are not a best practice solution or recommendations but an **interoperability and quality statement** for technical solutions

# Reference Architecture

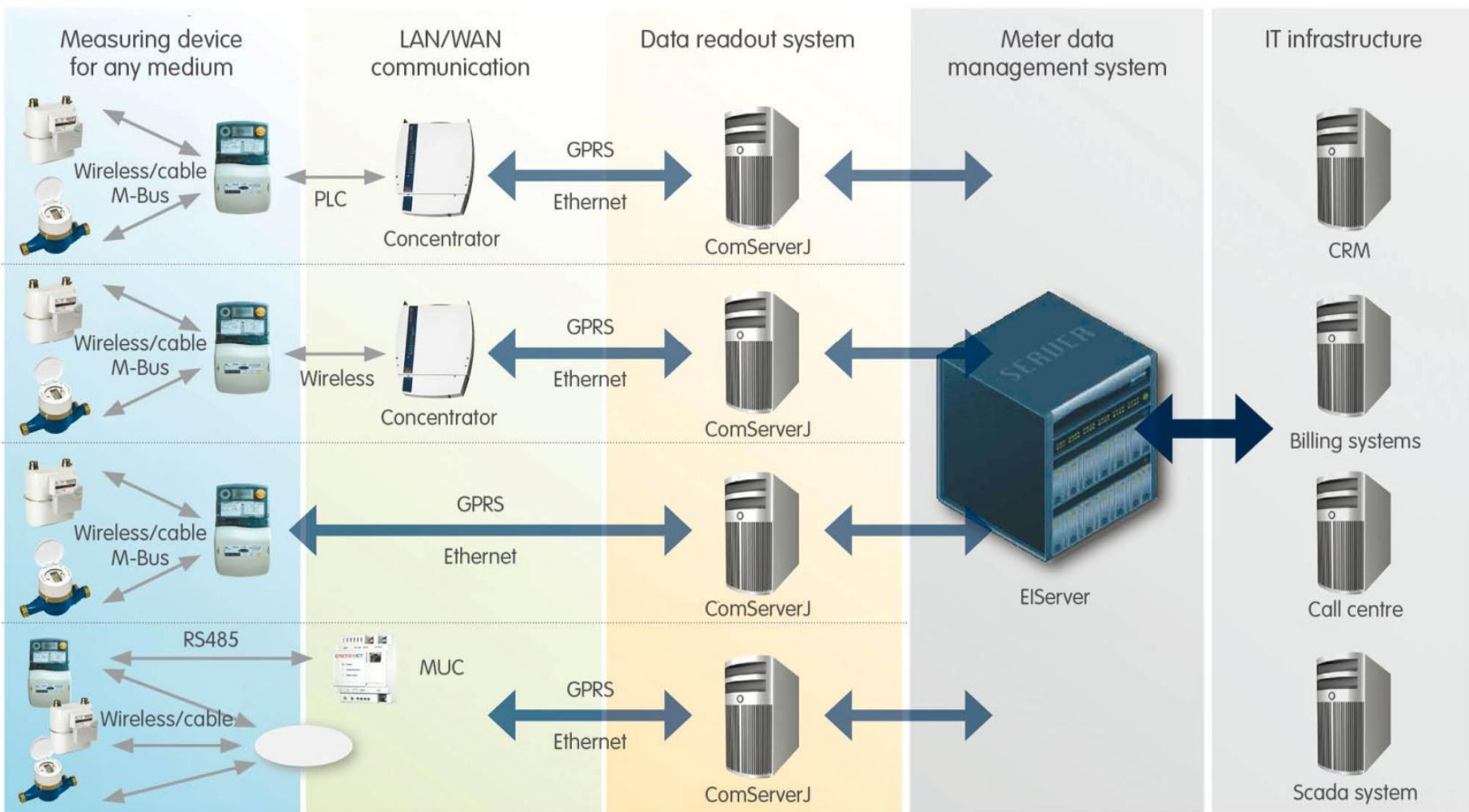




- **F1** – Remote reading of metrological register(s) and provision to designated market organisations (**Automatic Meter Reading**)
- **F2** – Two-ways communication between the metering system and designated market organisation(s) (**information exchange**)
- **F3** – To support advance tariffing and payment systems (**e.g. prepayment**)
- **F4** – To allow remote disablement and enablement of supply and flow/power limitation (**gas flow shut down, reopening?**)
- **F5** – To provide secure communication enabling the smart meter to export metrological data for display and potential analysis to the end consumer or a third party designated by the end consumer (**to facilitate energy services**)
- **F6** – To provide information via web portal/gateway to an in-home/building display or auxiliary equipment (**customer display**)

# Examples of smart metering configurations

## Supply chain



- To identify where new standards might be required, it was deemed appropriate to determine **functionalities in more detail**
- To **clarify** standardization requirements
- To ensure **interoperability** and **consistency** in the smart meter data flows
- Technical Report shows how Use Cases relate to each functionality



- Important additional objective of **facilitating Smart Grid applications**, notably through the incorporation of distributed generation
- Smart Grids are outside Mandate M/441 scope
  - However, Smart Metering is a **key enabler for Smart Grids**,
  - Providing 2-way information flows between the meter and the designated market organisation(s)
- **Mandate M/490** defined for Smart Grids
  - Parallel Smart Grid Coordination Group established
  - Close liaison is maintained between these initiatives
- The functionality to use the Smart Metering Infrastructure for **Demand Side Management** purposes is covered by the M/490 Mandate

- An Ad-Hoc Working Group has been established mid 2012
- Basic approach for defining security and privacy requirements is taken from the SG-CG work
- Based on Use Cases
- 2012 report describes:
  - The SG-CG approach applied to the Smart Metering reference architecture
  - The current status of work in the TC's on P&S aspects of standards
- The group recommends:
  - To develop a specific EU reference set of P&S requirements for Smart Metering
  - To investigate the possibility to develop a EU approach for P&S certification

- **CEN-CLC-ETSI Technical Report 50572:2011**
  - ‘Functional reference architecture for communications in smart metering systems’
  - Adopted in December 2011, freely available online
- **Ongoing work programme**
  - More than 60 standards available and more than 50 standards currently under preparation!
- **Use Cases**
  - Guidelines for the development of Smart Metering Use Cases
  - Report on Smart Metering Use Cases
- **Report on ‘Security and Privacy Approach for Smart Metering’**
  - Under development
- **Report of activities at the end of 2012**
  - Finalised

# Conclusion

- European smart metering standardization programme is **unique**
- To ensure European Standards which meet the needs of Authorities, Industry as well as **consumer expectations**
- **European Standards** allowing the smart metering project implementation are **already existing (and other are under development)**
- **Electricity, gas, water and heat** utilities are concerned
- Smart Metering combines **traditional utilities** with the fast changing world of **communications (IT)** → standardization activities in smart metering field will continue
- It is very challenging by its **goals** and **size** → hundreds of millions of meters could be changed in the next 8/10 years!



# THANK YOU

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