



EUROPEAN STANDARDS ORGANISATIONS

SMART METER CO-ORDINATION GROUP

Smart metering & the smart home

Common functional communications standards for smart metering systems

David Johnson

CEN-CENELEC-ETSI Smart Meter Co-ordination Group

STARGRID Workshop, Hannover 10th April 2014

- Background to smart metering
- Mandate M/441
 - Smart Meter Co-ordination Group organisation & remarks
- Additional Functionalities
- Links with Smart Grids
- M/441 deliverables
- M/441 Communications Reference Architecture
- Smart Metering & the Smart Home
- Conclusions

- Introduction of intelligent (or smart) metering systems is promoted & 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) & subsequently Directive on Energy Efficiency (2012/27/EU)
 - Third Energy Package – Directives 2009/72/EC and 2009/73/EC → provisions on 'intelligent metering' in electricity and gas



- **Standardisation mandate M/441** on the development of an open communication architecture for utility meters. M/441 issued March 2009, accepted June 2009.
- **Aim:** To improve customer awareness of actual consumption in order to allow timely adaptation to their demands

- Formation of CEN-CENELEC-ETSI Smart Meter Co-ordination Group and relevant sub-groups:
 - SM-CG brings together **CEN, CENELEC and ETSI** and a **wide group of stakeholders** - energy regulators, industry, manufacturers, consumers...
 - Combines **traditional utilities** with the fast changing world of **communications (IT)**
 - All European stakeholders represented in smart metering standardisation programme
 - Includes **electricity, gas, water & heat** applications
 - Aim: to ensure there are European Standards which meet the needs of authorities, industry as well as **consumer expectations**
 - Challenging context by virtue of the **goals** and **scale of smart meter deployment**

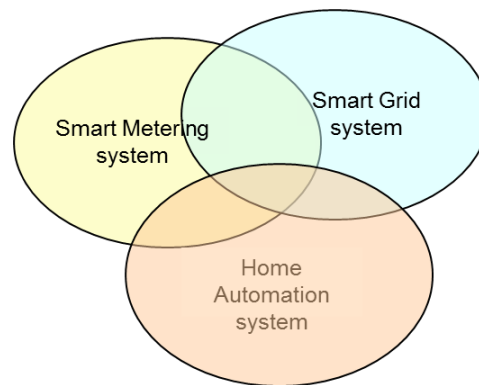
Mandate M/441 - Remarks

- In this context, standardisation **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**)
- Standards for communications are not a best practice solution or recommendations: they support an **interoperability & quality statement** for technical solutions
- **SM-CG standards do not cover 'back office'** or other industry IT systems impacted by smart meters (but work will have implications)

Additional functionalities identified in M/441

- **F1** Remote reading of metrological register(s) and provision to designated market organisations (***Automatic Meter Reading***)
- **F2** Two-way communication between metering system and designated market organisation(s) (***information exchange***)
- **F3** To support advance tariffing & payment systems (***e.g. prepayment***)
- **F4** To allow remote disablement & enablement of supply and flow/power limitation (***disconnection / reconnection***)
- **F5** To provide secure communication enabling smart meter to export metrological data for display and potential analysis to end consumer or 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***)

- Important additional objective of **facilitating Smart Grid applications**, notably through the incorporation of distributed generation and in **demand response**

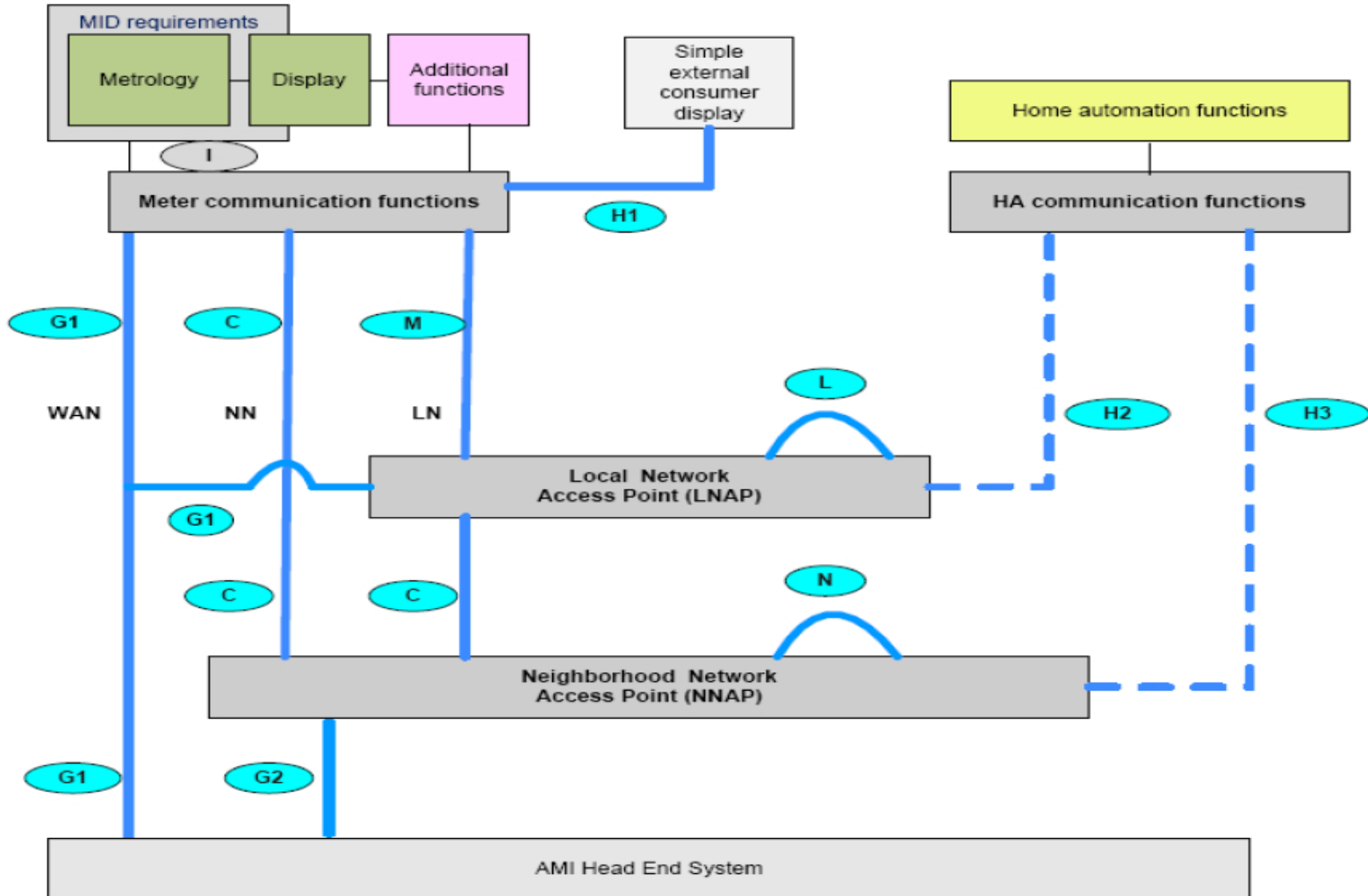


- Smart Metering Mandate M/441 (from March 2009); Smart Grid Mandate M/490 (from June 2011)
- **Smart metering typically an important element in the smart grid infrastructure** (though Smart Grid applications outside M/441 scope)
- **Close liaison** between Smart Meter & Smart Grid Co-ordination Groups

- **CEN-CLC-ETSI Technical Report 50572:2011**
 - 'Functional reference architecture for communications in smart metering systems'
 - Adopted in December 2011, freely available online
- **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'**
 - Work by Ad Hoc Working Group continues
- **Ongoing work programme**
 - Huge number of relevant standards identified & currently available
 - More standards in preparation

- **Report of activities** produced end 2012
 - SM-CG recognises **plethora of communication media** - wired and wireless using different modulations
 - SM-CG strategy is to ensure **semantic & syntactic interoperability** (i.e. interoperability at data model level → DLMS/COSEM). Recognised by STARGID respondents
 - Using **media-independent data model** over a range of communication media will not constrain adopting results of fast technology developments in media-specific communication technologies
- **Updated list of smart meter standards** for later this year
- SM-CG activities continue
 - **Continuing work programme in smart metering** – last issue Dec 2013, next issue July 2014
 - **SM-CG Task Force on privacy and security** aspects of smart metering standards
 - Point of liaison & co-ordination for new work in smart metering standardisation

Smart Meter Communications Reference Architecture



Communication of smart metering data to home/building management system

- relates to **H1, H2 and H3 interfaces** in Smart Meter Reference Architecture
- Complementary to 'upstream' work in IEC TC 57 (IEC 62746)
- Three work items in CLC TC 205:
 - prEN 50491-11 General requirements for Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS)
-- Part 11: Smart metering - Application specification - **Home display**
 - prEN 50491-12 General requirements for Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS)
-- Part 12: Smart grid - Application specification - **Interface and framework for customer**
 - prTR 50491-10: Smart Metering/Smart Grid – HBES architecture and use of standardised communications (future work)

- **European standards** allowing smart metering implementation **already exist**
- **Many others are under development** - standardisation work continues
- Broad consensus on using the **IEC / EN 62056 COSEM data model** for future implementations of electricity smart meters
- **Close liaison with SG-CG workstreams**
 - updated list of smart metering standards
- Work on demand response / flexibility, in particular the **home & building interface** delegated under M/490
 - displays
 - interface & framework for customer (neutral data model)

Thank you

www.cen.eu

www.cenelec.eu

www.etsi.org