

Promoting the interoperability of Smart Meters across Europe: the role of standards

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*IEEE International Forum on Smart Grids for Smart Cities (SG4SC)
Paris, 16-18 October 2016*

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2 Organizations



1 Network



CEN and CENELEC Development of Standards



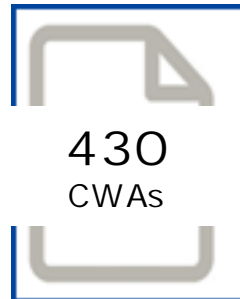
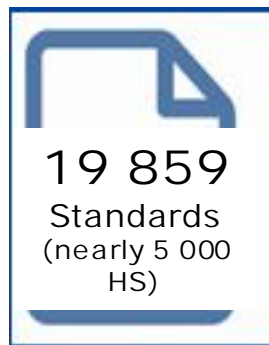
200 000
Experts



497
Technical
Committees



1 903
Working
Groups



CEN and CENELEC activities

Energy

ICT

Machinery

Healthcare

Materials

Pressure equipment

Transport and packaging

Measuring instruments

Research and Innovation

Fundamentals – CEN and CENELEC standards are ...

- Based on the national delegation principle
- Representing a consensus among all interested parties, including industry & SMEs and societal stakeholders
- Voluntary
- Developed by independent organizations clearly distinct from authorities
- Highly aligned with ISO and IEC standards

A unique system

CEN, CENELEC and ETSI Officially recognised as
European Standardization Organizations
(Regulation EU 1025/2012)



1 European Standard



→ 33 identical national standards

→ All conflicting standards removed



Access to a market of 600
Million consumers!

Smart Meters - Background

EU Directives on common rules for the internal market for electricity and gas (2009/72/EC and 2009/73/EC)

- implementation of 'intelligent metering systems' assisting the active participation of consumers
- If assessed positively, at least 80 % of consumers shall be equipped with intelligent metering systems by 2020
- Member States shall ensure the interoperability of those metering system

EU Directive on Energy end-use efficiency and Energy services ([2012/27/EU](#))

EC Recommendation on the preparation for the roll-out of Smart Metering System ([2012/148/EU](#))

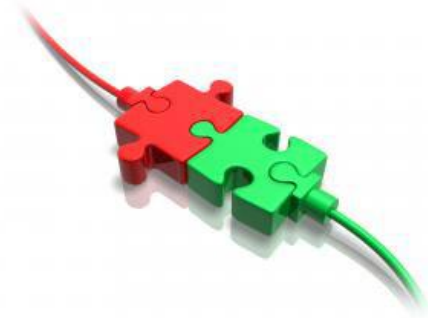
Mandate M/441

- EC Standardization mandate M/441 on Smart Metering (2009)

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-pa
- Architecture must be scalable and adaptable to future communications media
- Secure data exchange



The Smart Meters Coordination Group (SM-CG)

In response to Mandate M/441, the European Standardization Organizations (ESOs), CEN, CENELEC and ETSI decided to combine their expertise and resources by establishing the Smart Meters Coordination Group ([SM-CG](#))

A joint advisory body that provides a focal point concerning smart metering standardization issues

Objectives

- Provide recommendations to the ESOs
- Monitor new developments in smart metering applications
- Advise on communication technology standardization



The Smart Meters Coordination Group (SM-CG)

- 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
- Challenging context by virtue of the goals and scale of smart meter deployment

Main TCs involved

- [CLC/TC 13](#) 'Electrical energy measurement and control'
- [CLC/TC 205](#) 'Home and Building Electronic Systems (HBES)'
- [CEN/TC 294](#) 'Communication systems for meters and remote reading of meters'
- [ETSI/TC M2M](#) 'Machine to Machine'



Additional Functionalities for smart metering systems

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 (*customer display*)

F6 – To provide information via web portal/gateway to an in-home/building display or auxiliary equipment (*to facilitate energy services*)

Achievements in Phase I and II

- CEN-CLC-ETSI Technical Report 50572:2011 (Phase I)
 - 'Functional reference architecture for communications in smart metering systems'
 - Adopted in December 2011, freely available on [CEN-CLC website](#)
- Development of European Standards containing harmonised solutions for additional functionalities within interoperable frameworks (Phase II)

[SM-CG report](#) (2012) - a summary of all the work undertaken during the period 2009-2012 of M/441 and guidance to the reader

Achievements in Phase I and II

Ongoing work programme

- More than 60 standards available and 40 under preparation

Use Cases

- Guidelines for the development of Smart Metering Use Cases
- Report on Smart Metering Use Cases

Work on privacy and security

[Smart Meters Co-ordination Group - Privacy and Security approach – part I](#) :

An approach to define privacy and security requirements for Smart Metering

[Smart Meters Co-ordination Group - Privacy and Security approach – part II](#) :

A repository of requirements applicable in different Member States and compares approaches on security certification schemes for Smart Metering

Achievements in Phase I and II

- [Smart Meters Co-ordination Group - Privacy and Security approach – part III](#) - A repository of security threats and recommendations regarding security certification and an update of the status of work
- [Smart Meters Co-ordination Group - Privacy and Security approach – part IV](#) - A report prepared by the SM-CG Task Force on Privacy and Security about the definition of a minimum set of requirements based on the requirements repository developed by the SMCG on privacy and security
- As **follow-up** the SM-CG will work on a European security certification approach for Smart Meters and other components of the AMI

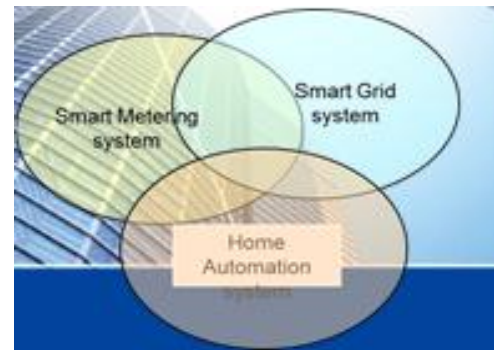


Demand Response

- Demand Response functionalities **still evolving** as implementations further develop
- Standardization framework is considered **robust and flexible** to accommodate future Use Cases and the evolution of suitable standards
- **Necessary standards exist or are under development** - in CLC/TC 13 'Equipment for electrical energy measurement and load control', CLC/TC 294 'Communication systems for meters and remote reading of meters', CLC/TC 205 'Home and Building Electronic Systems (HBES)' and CLC/TC 57 'Power systems management and associated information exchange'
- Next step is to **harmonise data models** that are now developed by different industries and Technical Committees

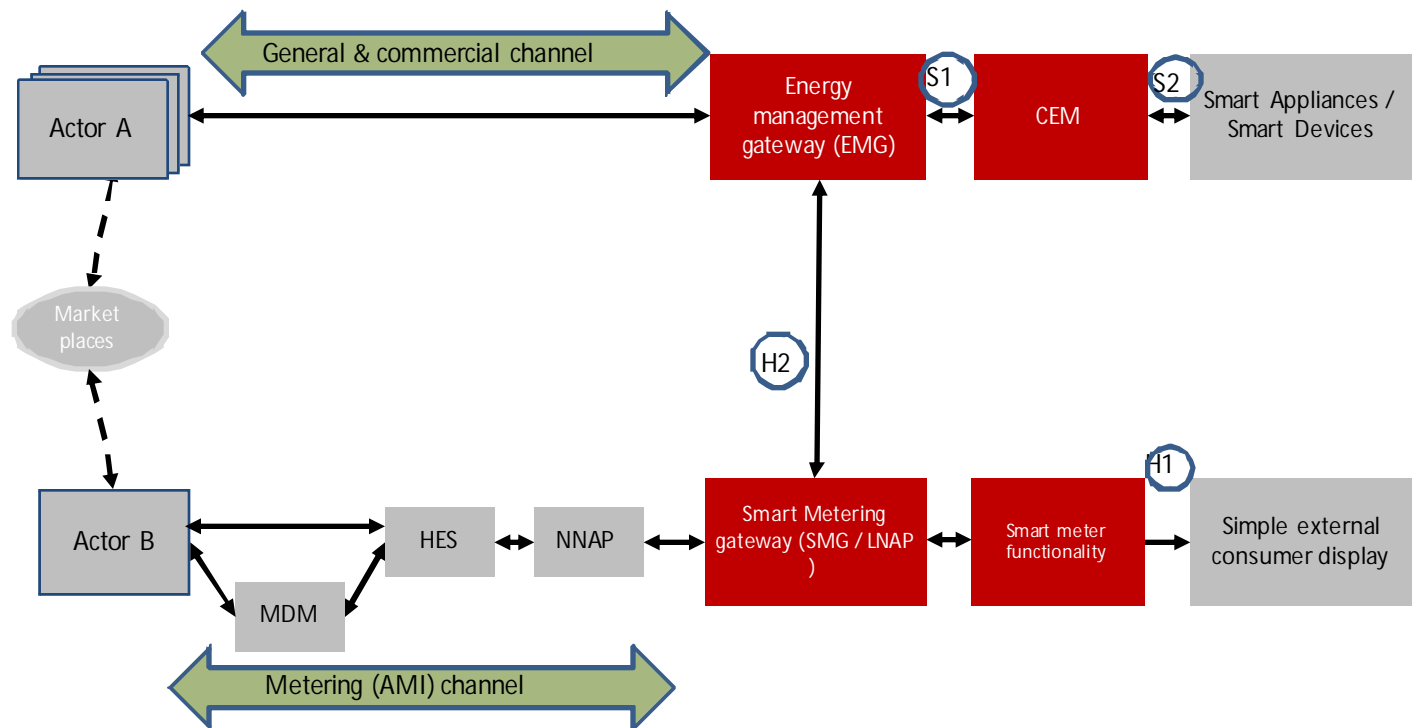
Link with Smart Grids

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

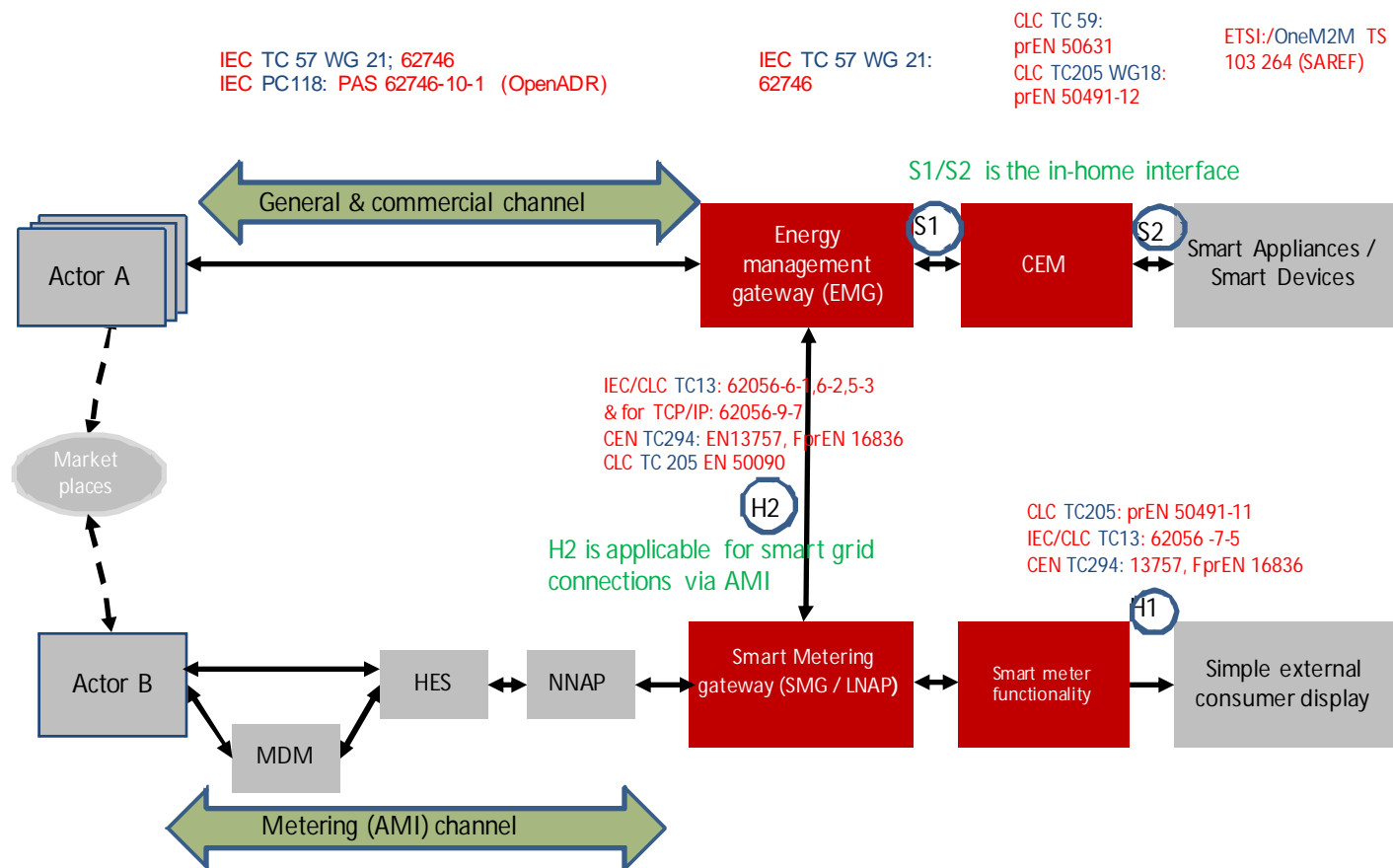


- Smart Metering Mandate M/441 (from March 2009); Smart Grid Mandate M/490 (from June 2011)
- Smart metering typically an important element in the smart grid infrastructure (though Smart Grid applications outside M/441 scope)
- **Close liaison** between Smart Meter & Grids groups

Smart metering & smart grid architectures (M/441 & M/490)



Smart metering & smart grid architectures (M/441 & M/490)



Smart Meters and Smart Homes

CENELEC TC 205 'Home and Building Electronic Systems' - Standards series EN 50090 smart home and building protocol

- European standardized Hardware requirements for home and building automation products
- Smart metering/grid specific extensions (part of M/441)

Smart energy meters are essential components of Smart homes

- EN 50491 Part 11 'Smart Metering- Application Specifications -Home Display' – published in May 2015
- EN 50491 Part 12 'Smart grid - Application specification - Interface and framework for customer' under development
- CLC/TS 50560:2014 'Interoperability framework requirement specification'

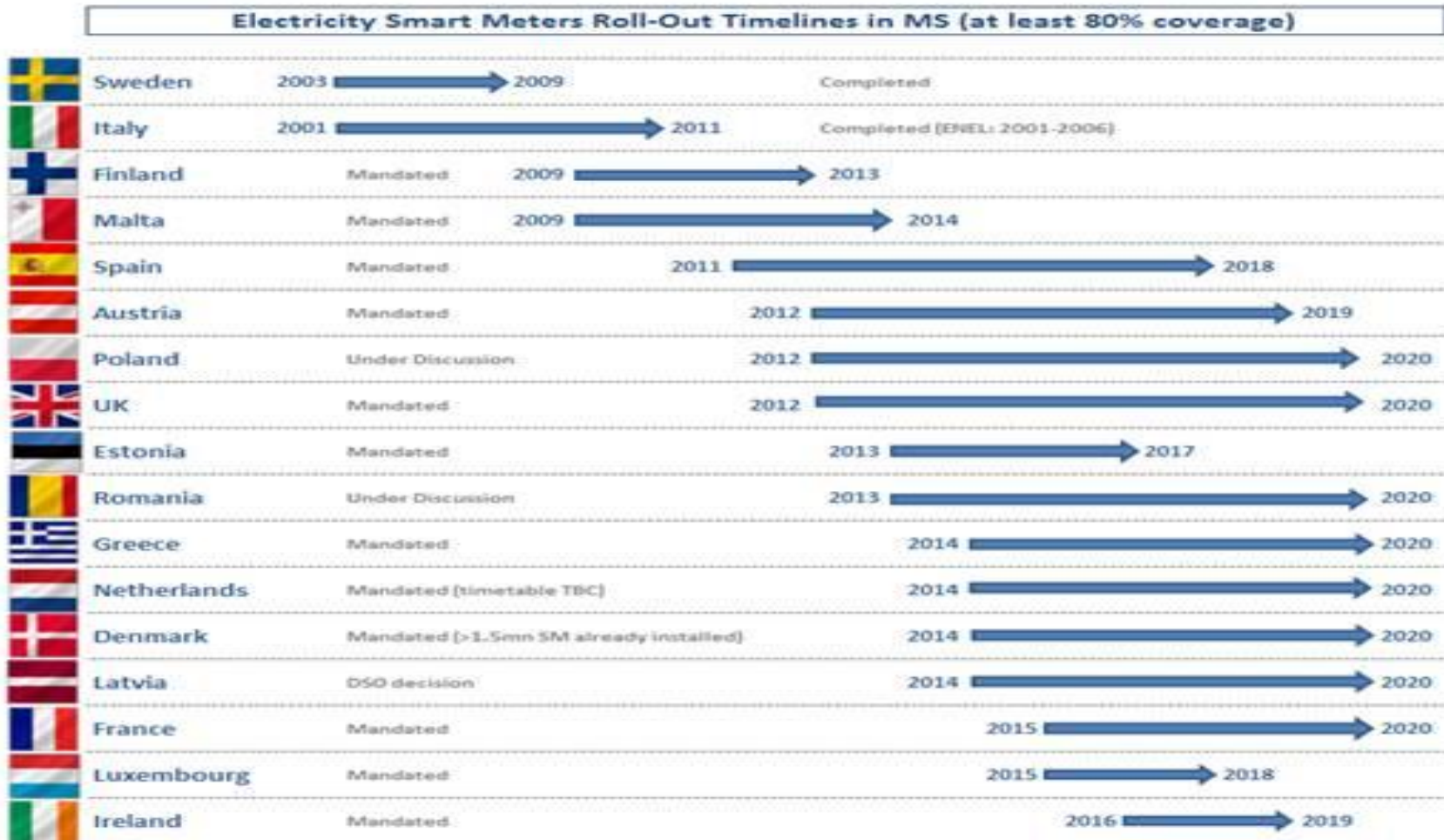


Conclusions

- CEN-CENELEC-ETSI Smart Meters Coordination Group was pioneer for smart metering standardization
- New work is under development - standardisation work will continue to cope with technical improvements and new technologies
- Additional (informative) reports are available to support standardization: Use Cases, technical requirements, minimum security requirements
- Close liaison with CEN-CENELEC-ETSI Smart Grids Coordination Group
- The Smart Meters Coordination Group work is supporting the smart meters roll-out in Europe



Smart Meters roll-out in Europe



Source: European Commission (2016)