



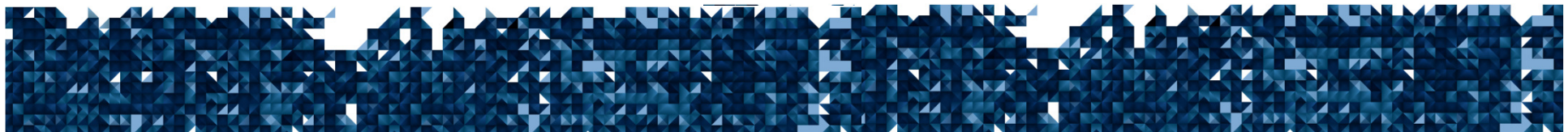
Workshop Smart Grid
Standardisation
May 16th 2013



Session 2

Smart Metering

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Regulation

“The 3rd Energy Package”:

Electricity Directive 2009/72/EC

Gas Directive 2009/73/EC

Objectives (smart metering):

- Better informing customers of their consumption (increasing awareness)
- Enable better control the energy consumption (adjusting behaviour according to price and load signals, and therefore reducing bills)
- Ensure the active participation of customers (“prosumers”) in the electricity and gas supply market

ELECTRICITY AND GAS	
Data security & integrity	E/G 1. Customer control of metering data
ELECTRICITY	
Customer services	E 2. Information on actual consumption and cost, on a monthly basis, free of charge
	E 3. Access to information on consumption and cost data on customer demand
	E 4. Easier to switch supplier, move or change contract
	E 5. Bills based on actual consumption
	E 6. Offers reflecting actual consumption patterns
	E 7. Remote power capacity reduction/increase
	E 8. Remote activation and de-activation of supply
	E 9. All customers should be equipped with a metering device capable of measuring consumption and injection
	E 10. Alert in case of non-notified interruption
	E 11. Alert in case of exceptional energy consumption
Costs and benefits	E 12. Interface with the home
	E 13. Software to be upgraded remotely
Roll-out	E 14. When making a cost benefit analysis, an extensive value chain should be used
Roll-out	E 15. All customers should benefit from smart metering
	E 16. No discrimination when rolling out smart meters
GAS	
Customer services	G 2. Information on actual consumption and cost, on a monthly basis, free of charge
	G 3. Access to information on consumption and cost data on customer demand
	G 4. Easier to switch supplier, move or change contract
	G 5. Bills based on actual consumption
	G 6. Offers reflecting actual consumption patterns
	G 8. Remote enabling of activation and remote de-activation of supply
	G 11. Alert in case of exceptional energy consumption
	G 12. Interface with the home
	G 13. Software to be upgraded remotely
Costs and benefits	G 14. When making a cost benefit analysis, an extensive value chain should be used
	G 15. All customers should benefit from smart metering
Roll-out	G 16. No discrimination when rolling out smart meters

Table 1: ERGEG's guidelines of good practice on regulatory aspects of smart metering



Mandate M/441

- Scope: non-metrological aspects of the meter
 1. Develop a European standard that comprises a software and hardware open architecture for meters (**1st phase**); it must support :
 - Secure communication
 - Bidirectional communication
 - Standardised interfaces and data exchange formats
 - Allow advanced information, management and control systems for customers and service suppliers
 - Scalable
 - Permit fully integrated solutions, modular and multi-part solutions
 - Consider current communications media and be adaptable for future communication media
 2. Develop European Standards containing harmonised solutions for additional meter functionalities (**2nd phase**):
 - Interoperable framework: enable interoperability of utility meters
 - Using when needed the specified open architecture



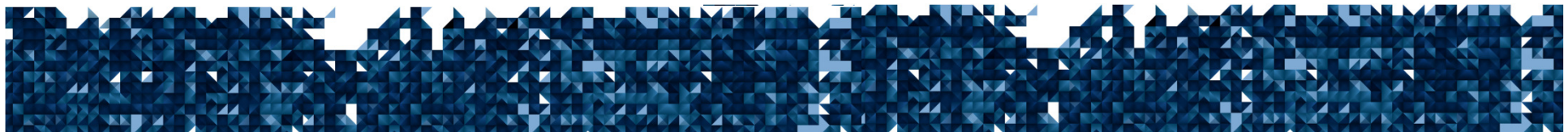
Smart Metering Coordination Group (SM-CG)

- **Functionality 1:** remote reading of metrological register(s) and provision to designated market organizations
- **Functionality 2:** two-way communication between the metering system and designated market organizations
- **Functionality 3:** to support advanced tariffing and payment systems
- **Functionality 4:** to allow remote disablement and enablement of supply and flow/power limitation
- **Functionality 5:** 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
- **Functionality 6:** to provide information via web portal/gateway to an in-home/building display or auxiliary equipment

The smart metering system may be used for a further important functionality (outside the scope of M/441):

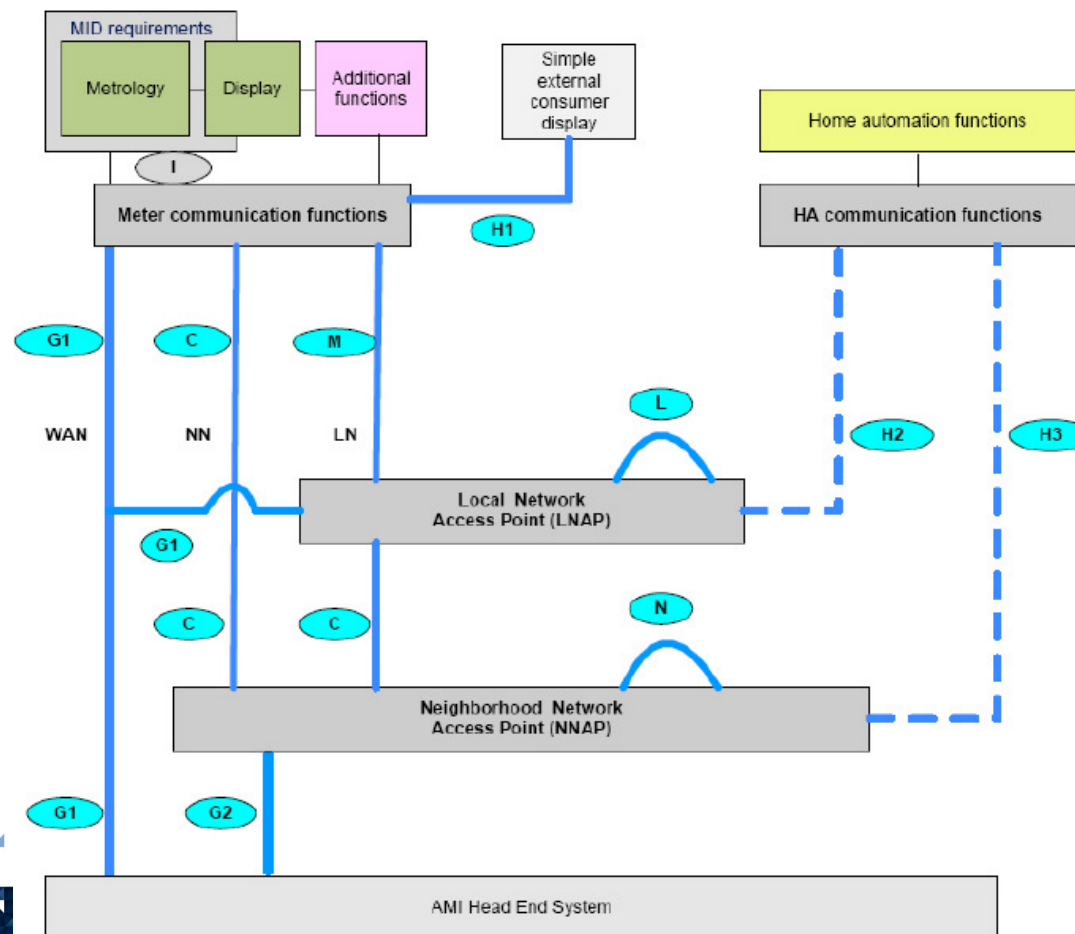
- **Functionality 7:** enable communication of AMI components with devices or gateways within the home/building used in the provision of energy efficiency and demand-side management services.

“High level functionality” → “Low level functionalities” → “Lowest level functionalities” → “Use cases”



Smart Metering Coordination Group (SM-CG)

- **Technical Report TR 50572** “Functional reference architecture for communication in smart metering systems” (December 2011)



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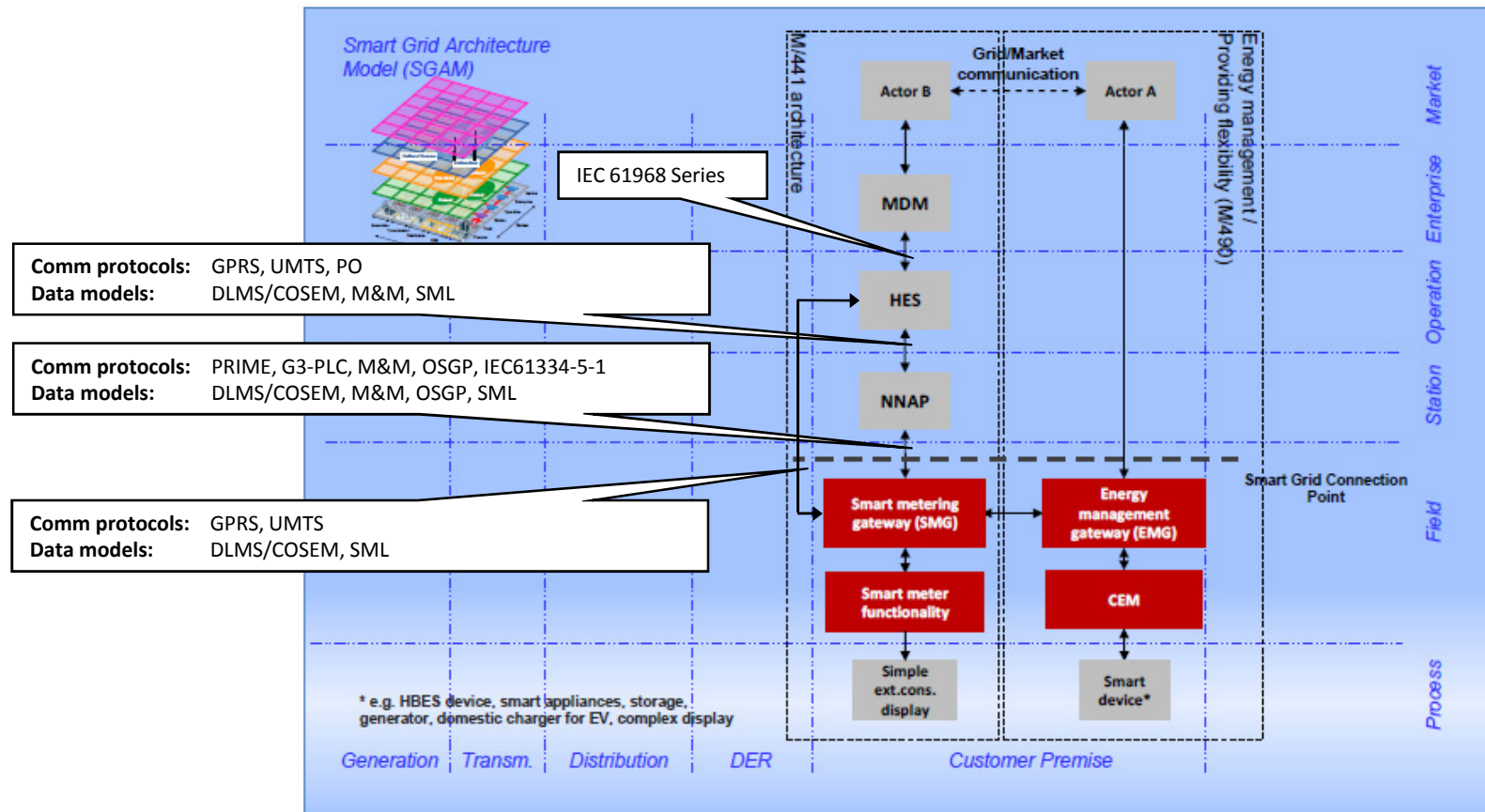
- **Technical Report TR 50572** “Functional reference architecture for communication in smart metering systems” (December 2011)

Identification of communication standards:

- General standards
- Lower layer standards
- Higher layer standards
- Data model standards
- Comm profile standards

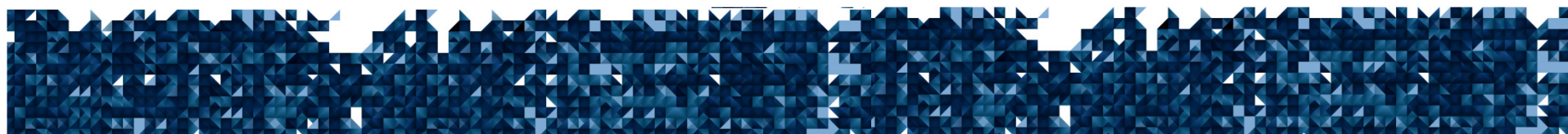
Existing standards	Standards to be developed (list is not limitative)	IC	M/441 Interface relevance							
			M	H1	H2/H3	C	G1	G2	L	N
- EN 50065-1:2001: Signalling on low-voltage electrical installations in the frequency range 3 kHz to 148.5 kHz - Part 1: General requirements, frequency bands and electromagnetic disturbances		CLC TC 205A	x	x	x	x	x		x	x
Lower layer standards										
EN 62056-31: Electricity metering – Data exchange for meter reading, tariff and load control – Part 31: Use of local area networks on twisted pair with carrier signalling	EN 62056-3-1: Electricity metering data exchange – The DLMS/COSEM suite – Part 3-1: Use of local area networks on twisted pair with carrier signalling	IEC TC 13	x			x				
EN 62056-42: Electricity metering – Data exchange for meter reading, tariff and load control – Part 42: Physical layer services and procedures for connection-oriented asynchronous data exchange		IEC TC 13	x	x		x				
EN 61334-5-1: Distribution automation using distribution line carrier systems – Part 5-1. Lower layer profiles – The spread frequency shift keying (S-FSK) profile		IEC TC 57				x				
EN 61334-4-32: Distribution automation using distribution line carrier systems – Part 4: Data communication protocols – Section 32: Data link layer – Logical link control (LLC)		IEC TC 57				x				
EN 61334-4-511: Distribution automation using distribution line carrier systems – Part 4-511: Data communication protocols – Systems management – CIASE protocol		IEC TC 57				x				
EN 61334-4-512: Distribution automation using distribution line carrier systems – Part 4-512: Data communication protocols – System management using profile 61334-5-1 – Management Information Base (MIB)		IEC TC 57				x				
	prTS 50567-1: Meter data exchange over power lines – Part 1: Lower layer profile using OFDM modulation Type 1 (NOTE this is the G1M2 specification.)	CLC TC 13				x				
	prTS 50567-2: Meter exchange over power lines – Part 2: Lower layer profile using OFDM modulation Type 2 (NOTE this is the G3 specification.)	CLC TC 13				x				

Overview of communication protocols



Some industrial initiatives

PROTOCOL	COMMUNICATION LAYER	STANDARD	
METERS&MORE	Data model Application layer Data link layer Physical layer	prTS 50568-6 prTS 50568-5 prTS 50568-4 prTS 50568-4	
PRIME	Convergence layer Data link layer Physical layer	prTS 50567-1	ITU-T G.9904 ITU-T G.9904 ITU-T G.9904
G3-PLC	Data link layer Physical layer	prTS 50567-2	ITU-T G.9903 ITU-T G.9903
OSGP	Data model Application level Network layer Physical layer	ETSI GS OSG 001 ETSI GS OSG 001	<i>Using:</i> ANSI C12 (adpated) ISO/IEC EN 14908 ETSI TS 103 908



Presentations

- PRIME Alliance – *Alessandro Moscatelli (STMicroelectronics)*
- METERS & MORE Association – *Robert Denda (ENDESA)*
- ETSI M2M: oneM2M – *Joerg Swetina (NEC)*

