SMCG/Sec0009/DC

Standardisation mandate to CEN, CENELEC and ETSI in the field of measuring instruments for the development of an open architecture for utility meters involving communication protocols enabling interoperability
M/441

SMART METERS CO-ORDINATION GROUP

DRAFT REPORT
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CENELEC Central Secretariat
Avenue Marnix 17
B-1000 Brussels

Contents

1. Introduction

The introduction of intelligent metering systems (also called smart metering systems) is promoted by the European Union through different recent regulations which should lead to a wide rollout of electricity and gas meters in Europe. The main concerns are the development of greater energy efficiency awareness by end users and energy savings.

The European Commission has issued a mandate for the standardization of Smart Metering functionalities and communication for usage in Europe for electricity, gas, heat and water applications (M/441 – Annex 1). The standardization process shall ensure interoperability of technologies and applications within a harmonised European Energy Market.

The standardization process is mandated to the 3 European Standards' Organizations (ESO) CEN, CENELEC and ETSI. There are about 110 applicable technical standards available today which cover parts of a Smart Metering application. No standard covers the full application range.

In addition to the existing EN standards, several national standards and proprietary solutions exist and many are proposed now in member states to become standards.

2. Regulatory framework

2.1 The Energy Services Directive and the Third Energy Package

The term "smart metering" is not explicitly mentioned in European directives or regulations. However the Directive on Energy End Use Efficiency and Energy Services (Directive 2006/32/EC) refers to "*competitively priced individual meters that accurately reflect the final customer's actual energy consumption and that provide information on actual time of use*". The Directive requires the provision of such meters in so far as it is technically possible, financially reasonable and proportionate in relation to the potential energy savings (Article 13 (1)).

In the recently adopted "Third Energy Package" of energy legislation, Directive 2009/72/EC for electricity and Directive 2009/73/EC for gas both require the implementation of "*intelligent metering systems that shall assist the active participation of consumers in the … market"* – see Annex 2 (2) and also Article 3(11) in electricity and Article 3(8) in gas.

Implementation may be subject to an economic assessment, which has to be completed by September 2012. In gas, the timeframe for roll-out is entirely for Member States to determine; in electricity, 80% of customers should have such meters by 2020.

For both electricity and gas, Member States "*shall ensure the interoperability of those metering systems to be implemented within their territories and shall have due regard to the use of appropriate standards and best practice and the importance of the development of the internal market…"* (Annex 1(2)).

2.2 The Measuring Instruments Directive

The primary objective of legal metrological control is to protect consumers and business alike when undertaking transactions based on a measure of quantity. Effective legal metrological control ensures that trade based on measurement is accurate, reliable and fair. It is a fundamental part of an efficient trading economy.

The Measuring Instruments Directive (2004/22/EC - MID) was implemented across the EU to standardise provisions related to legal metrological control of most types of measuring instruments (including utility meters). EU Member States must not, for reasons covered by the Directive, create barriers to the free movement, within the EU, of meters complying with the requirements of the MID.

It is acknowledged that the MID permits measuring instruments to have additional functions beyond those required to comply with essential requirements stated in the Directive. The MID also makes provisions to ensure that the measurement results or the integrity of the measurement function/accuracy is not compromised by those additional functions.

3. Mandate M/441

Mandate M/441 should be seen in the context of the smart metering provisions in the European Directives noted above. Considering the effects of these provisions, the Commission envisages potential benefits arising from smart meters not only in terms of energy efficiency and energy savings, but also from improved retail competition, lower bills due to better customer feedback, new services for customers (including vulnerable customers), improved tariff innovation (time of use tariffs), more accurate billing, reduced costs and increased convenience for prepayment customers, less environment pollution and facilitation of microgeneration.

The background to the mandate and these provisions is the recognition of rapid technological developments in metering by which customers can be provided with improved information to help them manage their energy use and reduce carbon emissions. The effect of the mandated work should be to facilitate the smooth introduction of more advanced metering systems (commonly referred to as 'smart metering systems') offering additional functionalities; the mandate specifically mentions remote reading of utility meters and advanced information and management services for consumers and suppliers.

The deliverables of the Mandate M/441 are standards or technical documents. Standards are voluntary technical specifications and common technical rules for products or systems to be placed on the market. They shall ensure interoperability, customer protection and system reliability. Standards do not evaluate technical solutions or even more put different technologies in a valued ranking.

A lack of interoperability in the smart metering solutions adopted may reduce the scope for mass production and full competition at EU level which could be expected to reduce the price of such metering systems. The mandate therefore calls for the development of European standards which provide harmonised solutions within an interoperable framework. This framework should where necessary be based on communications protocols within an open architecture, with a view to achieving full interoperability.

This response recognises the need for the standards to permit a range of approaches – from fully integrated instruments to modular and multi-part solutions - and thus support innovation in equipment used. The standards are therefore intended to permit modular and multi-part solutions.

4. Objectives and tasks of SM-CG

To respond to M/441, the 3 ESOs worked together with stakeholders in a Smart Metering Co-ordination Group (SMCG – see Terms of Reference of the co-ordination group in Annex 3). SM-CG designated two ad hoc groups to consider the main issues addressed by the mandate, separating the definition of Smart Metering functionalities and the definition of applicable and appropriate communication standards as parallel processes. Ad Hoc Group 1 considered communications; Ad Hoc Group 2 considered additional functionalities.

Ad Hoc Group 1 met on 2 occasions, on 22nd June, 24th August. Ad Hoc Group 2 met on three occasions, on 22nd June, 16th July and 25th August. In addition, there were numerous exchanges of correspondence between members and liaison between the ad hoc groups. Group 2 was supported by Engage Consulting Ltd, whose services had been offered by ESMIG, to support the work of the SM-CG. (see scope of Ad Hoc Group 1 and 2 in Annex 4 and Annex 5 which amplify and clarify the remit given to the groups at the SM-CG meeting on 25th May and reflect discussion at the groups' first meetings).

Both groups noted the origins of the mandate and concentrated on meeting the needs of the residential (household) and small commercial (SME) sectors, recognising that in the case of the upper end of the market solutions are in many cases already in place.

The outcome of the work carried out by both groups forms the bulk of this report.

5. Common themes

The following were identified as common themes underpinning the work of both groups

5.1 Scope for harmonization

The approach of Member States will differ in terms of the economic rationale for smart metering, the national structure of the sectors to be covered and the nature of existing dataflows between market participants. For this reason, smart metering solutions can differ between Member States.

It is essential not to limit the scope for future innovation or run counter to the responsibility of Member States to introduce smart metering within their national contexts. Provided the architecture where necessary is open, the requirements of the mandate should be able to be met by the establishment of one or more suitable standards applying to each functionality or use case. The goal is to facilitate harmonised solutions through appropriate voluntary standards. Member States will then be able to specify their own requirements within such a harmonised framework, taking account of national legislation and specific local concerns on e.g. data security or consumer protection.

It is recognised that companies 'back office systems', existing industry processes or dataflows will have to be modified appropriately to accommodate the introduction of smart metering and any new interfaces necessary created. This is likely to entail review of the protocols used in such back office systems, some of which may be determined at MS or industry level. The existence of a harmonised smart metering framework will facilitate these modifications.

It is not intended to extend the scope of harmonization or requirements into this area, which is currently not subject to EU level standardization or harmonization. For supporting systems, including those associated with the introduction of smart electricity grids, the choice of approach will be influenced among other things by what is easiest or cheapest for the different industry and/or company systems with which smart meters will ultimately interact. Considerations will vary by Country and depending on whether electricity, gas, water or heat is being considered. A wider group of stakeholders in each sector would need to be involved, which would have to take account of industry issues not related or only partially related to smart metering.

5.2 Interoperability

The mandate is centred on the interoperability of smart metering and communications architecture to support smart meters. There are numerous definitions of interoperability which could be adopted.

The focus of this report is interoperability at the local level i.e. the metering system and local area network (LAN), since a key objective of interoperability is to permit the connection of different components within a smart home and to minimise future constraints in this area. There is also a need

to ensure that the customer is able to enjoy a comparable level of service after moving house or changing supplier.

In the case of the latter, it is important that the introduction of smart metering does not create a barrier to competition or unnecessary cost – the customer has to be able to choose a new supplier and continue to receive a smart metering service without the need for the meter (at least) to be changed.[1]

For the purposes of this report, it was not envisaged necessary to go beyond a level of local interoperability which is sufficient to meet the above objectives and which ensure that such processes are seamless from the customer's perspective.

The SM-CG recognises that interoperability can be extended to the system level i.e. wide area network (WAN) or in the case of electricity to the level of a smart grid. This entails consideration of wider aspects which the group considers to lie outside the mandate and which in electricity are currently addressed via other groups.

As communication means the information exchange between communication network hubs, the standardization of communication means to make **interfaces, messages and workflows** interoperable. This does not mean to unify all data protocols or methods to just one technology but agree on usage and interpretation of standards.

Communication standardization does **not** mean to define **meters, devices or software** systems itself. Meters and devices have to comply with existing regulations such as those of the MID and have to meet individual requirements of customers (purchasers and project operators). Standardization should ensure interoperability between devices and not unified applications.

5.3 Open standards

A standard is considered to be open when it complies with the following conditions:

- The standard is adopted and will be maintained by a not-for-profit organization (e.g. ISO, IEC, ITU, CEN, CENELEC and ETSI…) and its ongoing development occurs on the basis of an open decision-making procedure available to all interested parties (consensus or majority decision etc.).
- The standard has been published and the standard specification document is available either freely or at a nominal charge. It must be permissible to all to copy, distribute and use it for no fee or at a nominal fee.
- Quality and level of detail – sufficient to permit the development of a variety of competing implementations of interoperable products or services. Standardized interfaces are not hidden, or controlled other than by the standard definition organisation promulgating the standard.
- The intellectual property - i.e. patents possibly present - of (parts of) the standard conforms to the FRAND principle (fair, reasonable and non-discriminatory) as laid down in CEN/CLC Guide 8 "Standardization and Intellectual Property Rights".
- There are no constraints on the re-use of the standard

6. Additional Functionalities

6.1 Approach to determining additional functionalities

[1] In water, this may instead be the responsible body selecting a new operator to provide a smart metering service, but the same principle applies.

Noting the limited time to develop the work programme and the time constraints on fulfilment of the mandate (30 months), a pragmatic approach was taken to the question of determining what were 'additional functionalities'. Also it was not attempted to define what a smart meter or smart metering system is. The group recognises that it is not a matter of saying what is permitted by the Measuring Instruments Directive and what falls outside its scope, since the MID expressly permits additional functionalities. The group thus considered the main areas of functionality in terms of what functions could typically be offered by smart metering systems, which are additional to the metrological functions currently performed by conventional meters / metering systems (see also section 6.2 below).

For the purposes of identifying where new standards might be required, it was felt appropriate to determine functionalities at a high level. Thus a top-down approach was adopted, but high-level functionalities have been broken down further into specific use cases in order to confirm that the scope of each functionality was properly defined.

6.2 List of additional functionalities

The proposed list of 6 main additional functionalities is set out below. The functionalities have been expressed in broad terms, so that they can be related to electricity, gas, heating/cooling (hereafter 'heat') and water. Identifying functionalities at high level will permit flexibility, innovation and competition.

- F1. Remote reading of metrological register(s) and provision to designated market organisation(s)
- F2. Two-way communication between the metering system and designated market organisation(s)
- F3. Meter supporting advanced tariffing and payment systems
- F4. Meter allowing remote disablement and enablement of supply
- F5. Communicating with (and where appropriate directly controlling) individual devices within the home/building
- F6. Meter providing information via portal/gateway to an in-home/building display or auxiliary equipment

Table 1 (included in Section 11 of this report) gives a more detailed explanation of each of the functionalities, how they would be used and their justification.

It is important to note the following assumptions which were used in the development of Table 1:

- Not all functionalities will necessarily feature in all applications / smart metering systems (electricity / gas / heat / water). The applications will differ in the extent to which the various functionalities are applicable or appropriate and how each functionality might be used.
- Not all functionalities will necessarily feature in all Member States. Even within a specific application (electricity / gas / heat / water), the Member State will have to have consider those functionalities against the need and the robustness of the economic case that can be made. That case will reflect industry structure and practice at national level.
- Many of the functionalities potentially applicable to gas, heat and water meters are critically subject to the availability of a sufficient power source. Battery life is currently a major constraining factor in the nature and frequency of use of the functionality provided.

For this reason, the list of functionalities must not be seen as a minimum list of smart meter functionalities, and it is not proposed that further standardization work should be directed to establishing such a minimum set of requirements at EU level. Decisions on the functionalities to be included in any particular smart metering application should be left to the individual Member State to determine. The purpose of this standardization work is to ensure that there are suitable standards available for the functionalities chosen.

6.3 Rationale/justification

Particular attention must be given to the **customer benefits** which derive from each functionality, given the overall objective in the mandate to improve customer awareness of consumption and the desire to improve services to customers within the utility areas covered. These are included in column 3 of Table 1.

The table also includes an initial assessment of the applicability of each area of functionality to electricity, gas, heat and water. It also provides an indication of the rationale or justification for each functionality. It should be recognised that this approach does not do justice to the differences between applications. As an example, many of the functionalities when applied to water are driven primarily by the need to reduce waste. The concern to reduce fraud or theft, which may be important in electricity and gas, is likely to be less relevant in water.

6.4 Identification of suitable standards

Table 2 (in Section 11) takes each functionality and suggests a suitable definition. This is supported by references to existing specifications/standards. An extensive database of standards has been assembled that appear to be relevant to the mandated work. The objective is to provide a sound and agreed basis for the subsequent work by the European Standards Organisations, who may decide to refine the definitions as necessary in the course of their work.

6.5 Legal and metrological control

In general, if a measurement result is used for billing purposes, then metrological control applies; also the consumer has to be able to verify the bill, without the use of tools, by comparing it with the measurement result on the metrologically controlled display.

> Some additional functionalities may be contained either in the meter or in a separate module(s). Regardless of how the functionality is provided, it has to be assured that any additional functionality does not influence the metrological characteristics of the meter. Note that, in the case of gas, volume conversion and temperature compensation is covered under the Measuring Instruments Directive and is therefore not deemed as an additional functionality.

Annex 6 gives the link to the WELMEC Guide 11.1 which relates to remote meter reading and metrological displays. It should be noted that whether or not the additional functionality is under direct metrological control, care has to be taken to ensure that such functionality does not inadvertently affect the meter's metrological characteristics. Useful information can be found in WELMEC 7.2 and OIML D31.

6.6 Analysis of existing documents

The standards and other documents noted in Table 2 for each functionality were further analysed and grouped into 3 categories:

1. Those key standards that could possibly be developed further, to support smart metering applications and delivery of the mandated work **(Green)**

2. Those documents which could provide useful insight into particular functionalities. While these would not necessarily be updated for smart metering, they could be used to inform the development of standards in the first category **(Amber)**

3. Those documents which are country specific in nature or not directly related to any smart metering functionality

The results of this analysis for the first two categories are summarised in **Figures A & B** below).

1. **<u>Figure A</u> – Key standards that could possibly be developed further (Green)**

Document	Relevant Technical Committee	Brief Description	Relevance to functionalities					
			F1	F2	F 3	F 4	F 5	F6
EN 13757	CEN/TC 294	Communication systems for meters and remote reading of meters (other than electricity)	√	√	√	√	√	√
EN 1434	CEN/TC 176 CEN/TC 294 (Part 3)	Heat Meters – Part 3 deals with data exchange and other parts are functional in nature.	√					
EN 14154	CEN/TC 94	Water Meters	√					
Standards controlled by CEN TC 237	CEN/TC 237	Gas Meters	√					
EN 50470 EN 62052 EN 62053	CLC/TC 13	Electric Meters	√					
EN 62056	CLC/TC 13	Electricity metering – Data exchange for meter reading, tariff and load control) (Defines data models and application independent of communication channel. Also describes how to interface with different communication channels)	√	√	√	√	√	
EN 61334-4-41 EN 61334-5-1	CLC/SR 57	Data communication protocols – DLMS standard, on which 62056-53 is based); (S-FSK) (Defines PLC Communications)	√	√		√	√	√
Parts of EN 61000 Extending EN 62052, EN 62053 and EN 50470	CLC/TC 210 CLC/TC 13 Power Quality Related	Electromagnetic compatibility (EMC). Suggested Parts 4-7, 4-15 and 4-30 may be relevant		√	√			
IEC 62055	CLC/TC 13	Electricity metering – Payment Systems			√	√		
EN 62054	CLC/TC 13	Electricity Metering Tariff and Load Control			√			
EN 13321 ISO/IEC 14543 EN 50090	CEN/TC 247 ISO/IEC JTC 1 CLC/TC 205	Open data communication in building automation, controls and building management - Home and building electronic system Information technology - Home electronic system (HES) architecture Home and Building Electronic Systems (HBES)					√	√

F1. Remote reading of metrological register(s) and provision of these values to designated market organisation(s)
F2. Two-way communication between the metering system and designated market organisation(s)
F3. Meter supporting advanced tariffing and payment systems
F4. Meter allowing remote disablement and enablement of supply
F5. Communicating with other devices in home/ building
F6. Meter providing information via portal / gateway to an in-home/building display or to auxiliary equipment

2. **<u>Figure B</u> - Documents providing useful insight into particular functionalities, which could be used to inform development of above standards (<u>Amber</u>)**

Document	Relevant Technical Committees	Brief Description	Relevance to Functionalities					
			F1	F2	F3	F4	F5	F6
EN 60870	CLC/SR 57	Telecontrol equipment and systems.	√	√			√	
IEC/TS 62351	IEC/TC 57	Power System Management and associated information exchange (Data Security)	√	√				
EN 50160 EN 61557-12	CLC/TC 8X CLC/SR 85	Power Quality related		√				
IEEE 802	-	Local Area Network standards and Metropolitan Area Network standards) [ISO/IEC 8820]		√			√	√
IEC/TR 62051	IEC/TC 13	Part 1: Electricity metering - Data exchange for meter reading, tariff and load control. (Glossary of Terms)		√	√	√		

3. Those documents which are country specific in nature or not directly related to any smart metering functionality

The various national documents identified may use some aspects of various standards but tend to cover other aspects not covered by existing standards. Key aspects of the requirements in these documents could be translated into appropriate standards as detailed in Figure A above, but it has not been considered appropriate to develop these documents further for the purposes of the mandate.

The remaining standards are only indirectly relevant to smart metering – they deal with particular aspects of metering linked to exchanging data with systems within a company or relate primarily to building automation, controls and building management. As such, they are considered to be out of scope for the purpose of the mandated work.

6.7 Gap analysis

Having considered the relevance of existing standards and other documents, it is possible to summarise those functionalities and other aspects which appear to be less well covered by such work and to which the ESOs may need to give particular attention.

- Functionality 1 (remote reading) This functionality appears to be generally covered

- Functionality 2 (2-way communication) Downloads e.g. software/firmware to non-electric meters need more development.

- Functionality 3 (advanced tariffing and payment systems) The existing standard covers electricity only. This needs to be extended to deal more fully with prepayment aspects and extended to cover relevant non-electric meters.

- Functionality 4 (remote disablement/enablement) IEC TC13 WG11 is currently undertaking a project focused on the safety aspects for electricity metering equipment via IEC 62052-31 – Product Safety Requirements. This safety standard is planned to replace all safety related requirements in other TC 13 standards (electricity meters only). This work is scheduled to be completed by June 2010 and it will need to be adopted as required into a European standard as soon as possible after this date. What additional safety aspects for non-electric meters will need to be reviewed and decided and the appropriate standards vehicle updated accordingly.

  Similarly the existing standards linked to load control are primarily focused on electrical systems. This needs to be extended appropriately to relevant non-electric smart meters that would make use of this additional functionality.

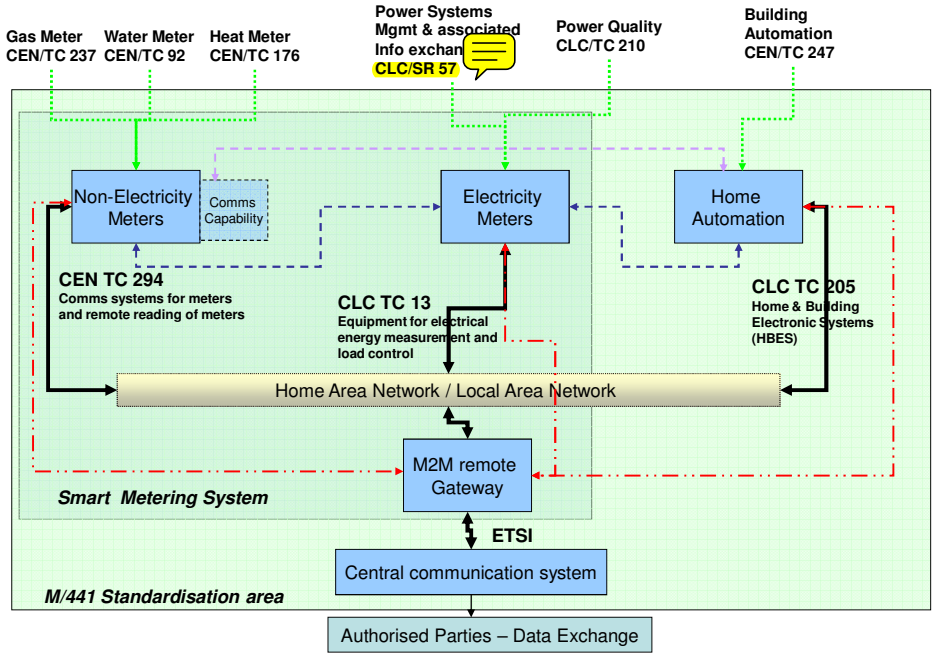
- Functionality 5 (Communication with other devices) There is possibly a need to consider where there may be gaps in existing standards related to home automation for non-electric applications.

- Functionality 6 (Meter providing information via portal / gateway to an in-home / building display or to auxiliary equipment) With regard to electricity metering systems the European standard EN 62056 specifies security mechanisms for data access and data transport (encryption and authentication) for non-smart meters. These principles will need to be extended for electricity smart metering systems as required and applied appropriately to cover non-electric smart metering systems.

- General: access security and encryption Functionality 6 addresses specific security aspects related to providing information into a home. There is a need to ensure that the overall principles underpinning the security of smart metering systems (physical and data related) and their associated communication infrastructure are fully aligned. This is an area that will tend to be heavily influenced by the requirements of each Member State, but there will be aspects that need to be set down in principles or standards.

Proposed responsibilities

The following diagram summarises the proposed responsibilities for the standardization work associated with additional functionalities.



Note: Depending on the application, the communications module could be integral with or remote from the meter

LEGEND:

Normal Connection from Meter or Home Automation via Home Area / Local Area Network to M2M remote gateway

Potential Alternative route via Electricity Meter then via Home Area / Local Area Network to M2M remote gateway

Potential Alternative Route connected directly to M2M remote Gateway from meters or Home Automation

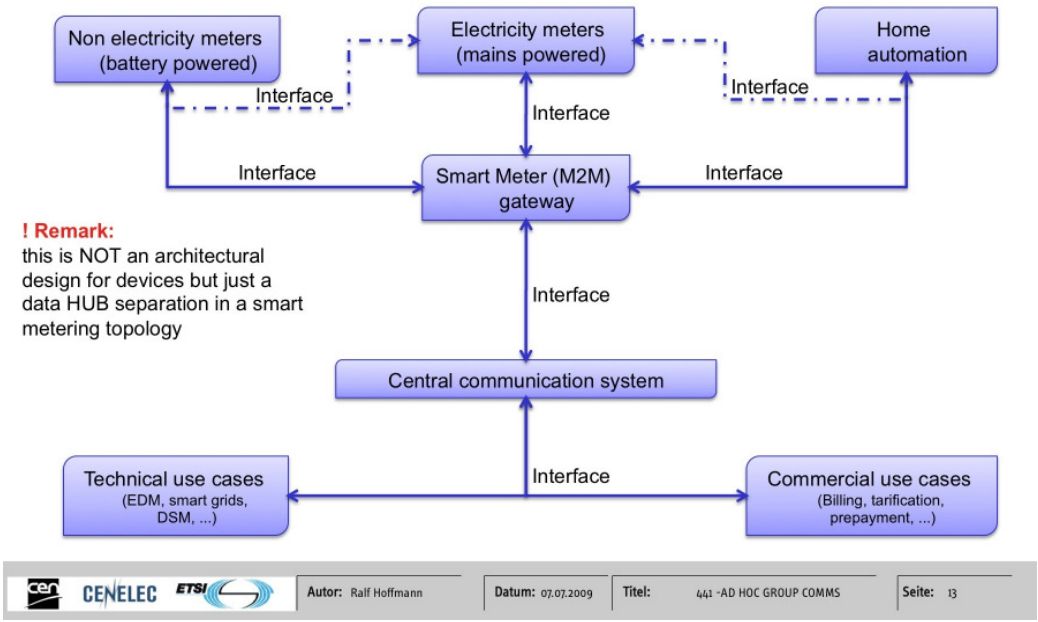
If Communication capability exists for non-electric meters independently, then there is potentially an alternative Route connecting non-electric meters to Home Automation, not going via electric meter.

Link to other Technical Committee that Lead TC will potentially need to liaise with

7. Communications

7.1 Communication standardization process M/441

The standardization bodies concerned with standardization divide a possible Smart Metering Network into communication hubs. The communication hubs are shown in the following picture:



A **central data communication system** is the "communication head" of a Smart Metering system. Data comes in from meters and meter data concentrators (if deployed) through WAN communication in public networks.

The interactor of such a central system is an **M2M remote gateway** which can be equipped inside any meter or installed separately. The design of such a communication hub depends on individual market and customer requirements. The communication procedures shall apply the same in any kind of installation.

Interactors of M2M remote gateways are **electricity meters, battery powered** meters or **home automation** and **customer information systems**.

There is an important difference, affecting communication, between electricity meters and other utility meters, concerning their power supply. Whereas electricity meters are mains powered, non-electricity meters are generally battery powered, and long battery life battery is of prime importance. Therefore, electricity meters can support more frequent communication and higher data volume compared with non electricity meters, where direct communication is likely to be more limited.

To come to appropriate standards, lead responsibilities are defined for each interface. A lead responsible ESO/TC shall work together with all other applicable standardization groups, monitor and maintain the standard definitions and develop existing standards where necessary towards fill the gap between today's available standard and what tomorrows functionalities will require.

7.2 Mandate standardization area

The picture identifies an M/441 standardization area where standards will be defined and apply to smart metering applications (upper area). The area where standardization in the upper segment will affect systems and applications is shown in the lower segment.

Any selected communication standard shall meet the general requirement of interoperability and openness. Appropriate standards or specifications shall be identified. One of them is EN 50090-3-3:2009 "Home and Building Electronic Systems (HBES) -- Part 3-3: Aspects of application - HBES Interworking model and common HBES data types".

As many of the processes in this central segment of legacy systems are based on manual or other input in a pre-smart metering phase today, the implementation of smart meters and the switch to automated process introduce the need to improve existing systems in this segment as well.

As an example: Smart metering could introduce online multi-tariff registration for customers. Tariffs are stored and commercially evaluated in billing/crm systems on manual basis today and most of the market data exchange architectures in Europe (e.g. Edifact/MSCONS) in some Countries do not support multi tariff market data exchange today. The parties concerned will need to consider how best to solve this issue but SM-CG will not suggest rules and procedures as this issue is not covered by the mandate expressed today.

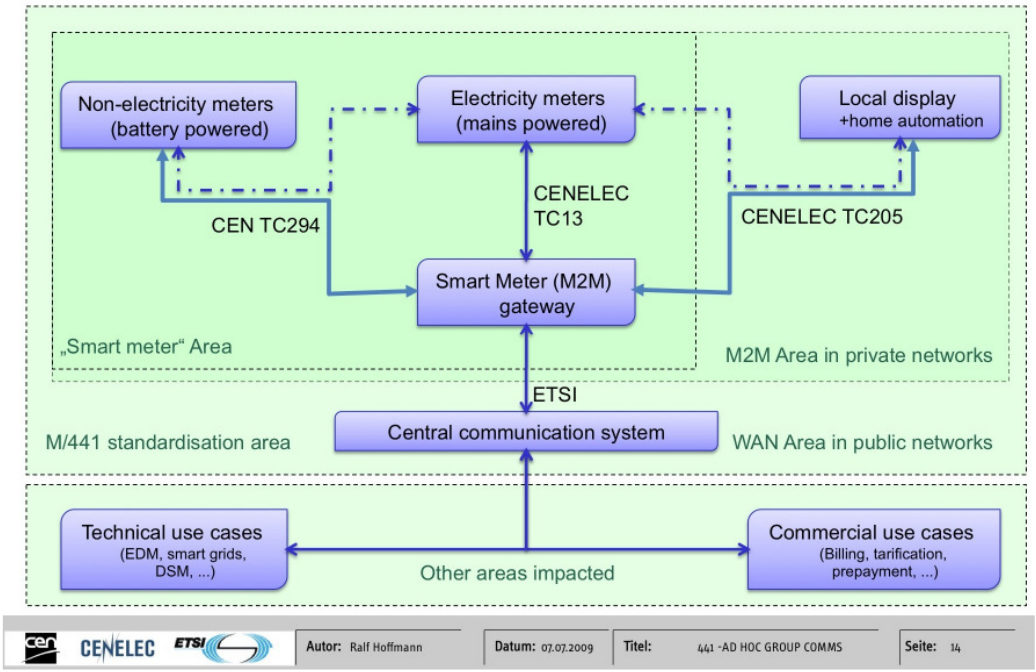
7.3 Standardization responsibility sharing model

The standardization model foresees 4 different main interface areas and mandates the standardization responsibilities as following:

Interface	Leading ESO	Coordinating ESOs
Communication between electricity meters and M2M gateways	CLC/TC 13	CLC/SR 57, CEN/TC 294, CLC/TC 205, ETSI PLT, ERM TG28
Communication between battery powered meters and M2M gateways	CEN/TC 294	CLC/TC13, ETSI ERM TG28

Communication towards home information and home automation systems	CLC/TC 205	CEN/TC 294, CLC/TC 13, CEN/TC 247, ETSI M2M, ERM TG28
WAN communication to central data collection systems and authorised parties	ETSI M2M, PLC LAN TC13	CLC/TC 13

The following diagram is a general overview and shall be used to allocate the responsibilities of defining, improving and maintaining the required communication standards.



The allocation of responsibility is meant in direction to the arrows, not the boxes. As said before, the standardization activity is towards the communication interface, represented by the arrows.

The icon blocks do not identify hardware components or installation locations in general. Communication gateways can be installed inside or outside a meter or a home.

The following separation describes a communication hub and the responsible main standardization organisation for this issue. Hubs can be affected by more than one standardization organisation or group (e.g. CENELEC plus ETSI or CEN plus ETSI plus IEC). The named responsible organisation is required to reflect related other stakeholders in their work and find common solutions that respect the other´s interest.

7.4 Standardization details

a) Electricity meters <-> M2M gateway

This interface between the electricity meter(s) and the M2M gateway, is necessary when this latter is a stand-alone physical unit.

Whichever architecture is chosen, the interfaces to the other hubs shall be the same to ensure interoperability:

- M2M gateway / electricity meter to battery powered (non-electricity) meters;
- M2M gateway / electricity meter to Home Automation;
- M2M gateway / electricity meter to concentrator / Central communication system.

The main issues are:

- the M2M gateway may act as a gateway or a proxy server towards the central system;
- protection of legal metrology function when the M2M gateway is integrated into the electricity meter;

Given, that:

- the M2M interface may be integrated into electricity meters;
- the DLMS/COSEM model covers all utility meters;
- the data model is independent of the communication medium;
- DLMS/COSEM specifies communication profiles already widely used for data exchange between the M2M interface and the concentrators or the Central communication system;

- the EN 62056 DLMS/COSEM standards are relevant for all interfaces and a close co-operation is needed between CLC/TC 13 and the other technical bodies.

***Recommendation 1*: Proposed main responsibility: CLC/TC 13**
CLC/TC 13 will need to co-operate with CEN/TC 294, ETSI ERM TG 28, and CLC/TC 205. This is already the case, as the EN 13757-1 standard published by CEN/TC 294 is strongly based on the IEC 62056 series established by CEN/TC 294, whereas PLC standards in the IEC 61334 series are using the CENELEC A-band specified by CLC/TC 205 and its subcommittee CLC/SC 205A.

Approved standards for data exchange:
Communication protocols:

- EN 62056-21:2002 Ed.1.0, Electricity metering - Data exchange for meter reading, tariff and load control – Part 21: Direct local data exchange
- EN 62056-46:2002 Ed.1.1 (and amendment 1:2007), Electricity metering – Data exchange for meter reading, tariff and load control – Part 46: Data link layer using HDLC-protocol
- EN 62056-47:2007 Ed. 1.0, Electricity metering – Data exchange for meter reading, tariff and load control – Part 47: COSEM transport layers for IPv4 networks
- EN 62056-53:2007 Ed.2.0, Electricity metering – Data exchange for meter reading, tariff and load control – Part 53: COSEM Application layer

Data model standards:

- EN 62056-61:2007 Ed.2.0, Electricity metering – Data exchange for meter reading, tariff and load control – Part 61: Object identification system (OBIS)
- EN 62056-62:2007 Ed.2.0, Electricity metering – Data exchange for meter reading, tariff and load control – Part 62: Interface classes

The EN 62056 standards listed also provide the basis of the EN 13757-1 standard established by CEN/TC 294. EN 13757-1 adopted the COSEM Object model and the communication profiles – in addition to M-Bus standards – from TC 13. The data identifiers (OBIS codes) are energy type specific.

IEC/TC 13 WG 14 maintains a D-Type liaison with the DLMS UA, providing registration, maintenance, development and conformance certification services for the users of IEC/EN 62056. A liaison with CEN/TC 294 is being established.

The most up-to date version of the DLMS/COSEM specification is to be found in the documents DLMS UA 1000-2 “Green Book” and DLMS UA 1000-1 “Blue Book”. The latest editions of these documents include many new elements for modelling smart metering applications, as well as he S-FSK PLC communication profiles based on the following standards:

- EN 61334-4-1:1996 Ed. 1.0, Distribution automation using distribution line carrier systems – Part 4: Data communication protocols – Section 1: Reference model of the communication system
- EN 61334-4-32:1996 Ed. 1.0, Distribution automation using distribution line carrier systems – Part 4: Data communication protocols – Section 32: Data link layer – Logical link control (LLC)
- EN 61334-4-511:2000 Ed. 1.0, Distribution automation using distribution line carrier systems – Part 4-511: Data communication protocols – Systems management – CIASE protocol
- EN 61334-4-512:2002 Ed. 1.0, Distribution automation using distribution line carrier systems – Part 4-512: Data communication protocols – System management using profile 61334-5-1 – Management Information Base (MIB)
- EN 61334-4-41:1996 Ed. 1.0, Distribution automation using distribution line carrier systems – Part 4: Data communication protocols – Section 41: Application protocol – Distribution line message specification
- EN 61334-5-1:2001 Ed. 2.0, Distribution automation using distribution line carrier systems – Part 5-1: Lower layer profiles – The spread frequency shift keying (S-FSK) profile

These new elements have been offered for international standardization to IEC/TC 13 WG 14.

b) Battery powered meters <-> M2M gateway

Battery powered meters do have limited power supply resources as the communication process needs to be operated over many years without changing the power supply battery (typically at le ast 10 years). For this issue, specific communication procedures have been developed that are different from the electricity meters communications. This separation has obvious physical reasons and shall be continued. Battery powered meters can have communication to M2M gateways or electricity meters.

This separation concerns mainly the lower layers of the protocol stack. The principles and solutions for higher protocol layers and application modelling may be the same, provided that these are efficient enough not to exhaust the battery.

The main issues of this hub are:

- gas meters
- heat meters
- water meters
- small data packets
- battery monitoring
- connection control, authorisation
- “One to many” remote communication towards M2M gateway (In this application field, it shall be noted that as regards RF communication, the same MAC is shared between CEN/TC 294 and CLC/TC 205 standards. To its experience in existing products, CLC/TC 205 can offer its expertise to cooperate with CEN/TC 294 in order to specify interoperability on application level in accordance with EN 50090-3-3)

Approved standards:

EN 13757 series: (Meter Communication) consisting of:

- EN 13757-1:2002: Communication systems for meters and remote reading of meters Part 1: Data exchange
- EN 13757-2:2004 Communication systems for and remote reading of meters Part 2: Physical and Link Layer twisted pair, baseband (M-Bus)
- EN 13757-3:2004 Communication systems for and remote reading of meters Part 3: Dedicated application layer (M-Bus)

- EN 13757-4:2004 Communication systems for and remote reading of meters Part 4: Wireless meter readout
- EN 13757-5:2008 Communication systems for and remote reading of meters Part 5: Wireless relaying
- EN 13757-6:2007 Communication systems for and remote reading of meters Part 6: Local Bus

The revision process for EN 13757-3 is started.

A revision process for EN 13757-1 has been applied for by BSI

A future revision process for EN 13757-4 has been informally suggested

***Recommendation 2*: Proposed main responsibility: CEN/TC 294**
It is already recognised that CEN/TC 294 will need to co-operate with CLC/TC 13, ETSI ERM TG28, and CLC/TC 205.

c) Home automation, -information <-> M2M gateway

Home automation and energy management systems need to get information on consumption data from smart meters. Home displays are designed to show actual load demand to customers. To enable open application support to these use cases, a passive data interface shall be defined to the electricity meter and the M2M gateway where home automation gateways can connect and get data. This method enables different kinds of home automation systems and energy management technologies to connect to smart meters within the European standard using a standardized interface. Home automation and energy management gateways can have communication to M2M gateways or electricity meters.

"Passive" means here that it shall not be possible to inadmissibly affect the operation and the metrology of the electricity meter / M2M gateway, in particular any legally relevant function.

The main issues of this hub are:

- interface to smart home architecture
- open communication protocol
- home displays
- "One to many" remote communication towards M2M gateway or electricity meter

***Recommendation 3*: Proposed main responsibility: CENELEC TC205**
CLC/TC 205 stands for Home and Building Electronic Systems, and is able to deal with Smart Metering Network aspects in home as well as buildings.
CLC/TC 205 activities include:

- *general requirements for different kinds of home and building automation systems including electrical safety, EMC, installation and interoperability considerations*
- *one Open Communication Protocol embodied in the EN 50090 series, which comprises a complete set of 4 communication media (TP, PL, RF, IP). The RF communications is compatible and shares the MAC access with CEN/TC 294 standards. The corresponding protocols are in use since 20 years*

Approved standards:

EN 50090 series: Home and Building Electronic Systems (HBES) - Open Communication Protocol consisting of:

- EN 50090 Part 1: Standardization structure
- EN 50090 Part 2: void
  Note: the content of previous Part 2-1 is incorporated in part 1
  Previous Part 2-2 and 2-3 are intended to be withdrawn the corresponding requirements will be transferred to EN 50491 series
- EN 50090 Part 3: Aspects of application

- EN 50090 Part 4: Transport layer and network layer
- EN 50090 Part 5: Media and media dependent layers
- EN 50090 Part 6: Interfaces
- EN 50090 Part 7: Management
- EN 50090 Part 8: Conformity assessment of products
- EN 50090 Part 9: Installation requirements

EN 50491 series (under development): General requirements for Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS) consisting of:

- EN 50491 Part 1: Overview and general requirements
- EN 50491 Part 2 Environnemental conditions
- EN 50491 Part 3 Electrical Safety requirements
- EN 50491 Part 4 Functional safety (planned standard)
- EN 50491 Part 4-1 General requirements (planned standard)
- EN 50491 Part 4-2 Particular requirements for safety related equipment (planned standard)
- EN 50491 Part 5: EMC General requirements (planned standard)
- EN 50491 Part 5-1: Requirements, conditions and test set-up
- EN 50491Part 5-2: Requirements for residential, commercial and light industry environments
- EN 50491 Part 5-3: Requirements for industrial environments
- EN 50491 Part 6-1: Installation requirements for HBES (planned standard)
- TR 50491 Part 6-2: Inspection and Testing of HBES Installation (planned standard)

Conformance to frequency regulation; protocol in accordance with RF SRD at 868MHz (i.e. ETSI EN 300 220), and EMC according EN50491-5 series (and EMC radio ETSI EN 301 489-1 and -3)

Further work needed:

- Define several interoperable communication levels based on 50090 series
    - EN50090 compliant communication on one of the available media including IP, or
    - object only based communication based on EN50090-3-3
- Application specification dedicated for Smart metering

Proposed time schedule for further work:

- Wait for specification of services and information data for customer.
- Working out the application specification for functional blocks, and if necessary additional data point types.
- Co-operation with : CEN/TC 294, CLC/TC 13, ETSI M2M, ETSI ERM, CEN/TC 28, CEN/TC 247

d) M2M gateway <-> Head end

The M2M gateway shall ensure mass data transportation from many distributed energy meters in the field to one or several concentrated data collection hubs using public networks. The functions of this gateway need to support all possible data items from all connected meters, home automation and energy management systems. As ETSI is the standardization body for telecom, wired and wireless communication markets, the definitions for future oriented M2M communication shall refer to their standards. Meter communication shall make use of secure and non proprietary protocols and communication platforms to ensure the best possible synergies for smart metering with other mass market M2M applications. Proprietary protocols could be considered also provided that they follow the FRAND principle.

The main issues of this hub are:

- remote communication
- gateway between private and public networks

- Open for applicable data protocol, architecture and physical layers
- remote reprogramming
- security access
- possible alliance with electricity meter

Metering systems are the central data backbone of any smart metering infrastructure. As these systems may be connected to public networks and may operate in security related utility environments, a proper support of state-of-the-art security obligations and guidelines is mandatory. To enable open access to metering systems of several suppliers and technology vendors, head end systems need to support a common communication and data exchange standard. Central communication systems may be the communication gateway to public smart meter data portals and need to support open interfaces to such portals.

The main issues of this hub are:

- data collector for M2M gateways and direct comms meters
- data warehouse for billing systems
- data and system access security
- installation management
- remote control of smart meters

***Recommendation 4*: Proposed main responsibility: ETSI M2M**
It is recognised that close co-operation with CLC/TC 13 will be necessary.

e) Other areas impacted

The following section illustrates some of the areas outside the M/441 mandate which will be impacted by the introduction of smart meters. Some areas are based on individual market rules defined by national regulators in EU member states and possible changes may require local action of regulation bodies. To enable full automation of a smart metering process in the market and to receive the best possible synergies of a smart metering implementation, amendments of the standards used are likely to be required.

- Technical use cases (EDM and smart grids management)

Smart metering data is required in smart grids environments to enable smart grid management decisions based on real consumption, cogeneration or grid status. Energy data management systems need to interchange meter operator contractual data, electronic access keys for meters and signature information which was unknown to such systems in a manual meter infrastructure.

- data analysis instance
- meter keys and installation data
- additional functionalities basis
- data warehouse
- gateway to 3rd parties applications, market partners

- Commercial use cases (legacy systems)

Smart metering data is required in commercial use cases to enable automatic billing and tarification processes to smart metering users. Online tarification and multi tariff handling are mostly unknown in today´s commercial metering applications (legacy systems) and are likely to have to be improved as well as market data exchange structures.

Applications e.g.
- multi tariff definition and exchange
- metrological requirements
- commercial gateway towards customers

- commercial gateway to market actors (grid, supplier, etc.)
- defines application support level
- defines change of supplier processes

8. Standardization process

8.1 General consideration

The ESOs should give preference to (draft) European standards out of the portfolio of the ESOs existing technical bodies.

If for specific cases or functionalities no suitable EN standard is available, the corresponding ESO technical body shall identify the gap between the existing EN standard and the required standard and start the standardization process for improvements. National proposals can be used to inform this process.

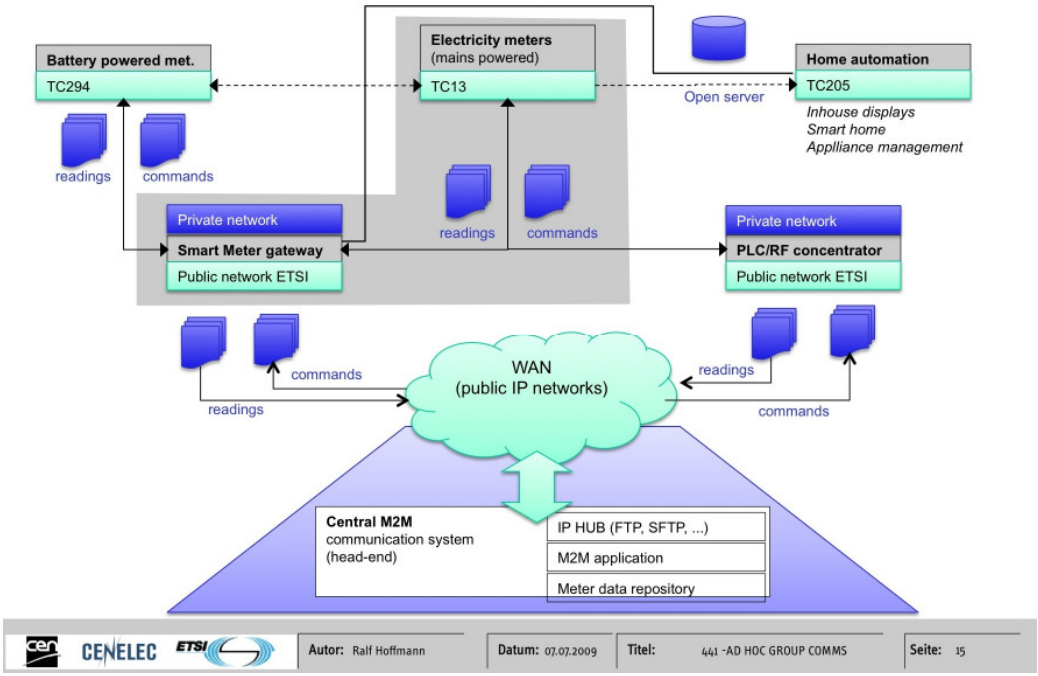
For the international standardization processes, the working group agrees in general terms to define, distribute and maintain European Standards related to Smart Metering. For CEN and CENELEC, respectively the Vienna and Dresden agreements will be extremely helpful in this context.

Existing standards vs. new standards

New technologies and new standard proposals should lead to an improvement of existing standard. This principle avoids existing standards from getting outdated and the helps the market to concentrate on widely accepted and maintained standards**.**

Technical Committees will seek co-operation with other relevant groups (fora and consortia such as the DLMS User Assocation, the Euridis Association and the ZigBee Alliance). New technologies can be adopted anytime but have to follow the existing standardization rules, especially regarding the proprietary solutions, within the ESOs. The ESOs shall take care to accept new work items from national mirror groups anytime when required. This ensures that new technologies, procedures and protocols (such as ZigBee, Wimax, etc.) can be adopted from the market and incorporated into the formal standardization process.

The made definitions on standardization responsibilities enable a broad range of individual technology and market solutions. As the recommended standards offer open access to any market player, technical solutions can be created and adopted freely. A possible example of an architectural setup can be made like that:



Other architectural setups based on individual requirement are possible. Examples will be adopted as part of the standardization mandate.

In its initial work, SM-CG has noted that the different legal or regulatory frameworks of Member States may sometimes have implications for the way in which Member States approach the MID. To assist the future standardization work of the ESOs in the area of smart metering, SM-CG proposes further work is carried out at an EU level, potentially under the aegis of WELMEC, to attempt to resolve differences of approach to the MID as far as possible and so facilitate smart metering standards harmonization. Clearly the active participation of all stakeholders will be sought and taken account of.

8.2 Standardization recommendations: Communication

***Recommendation 1*: Proposed main responsibility: CLC/TC 13**
CLC/TC 13 will need to co-operate with CEN/TC 294, ETSI ERM TG 28, and CLC/TC 205. This is already the case, as the EN 13757-1 standard published by CEN/TC 294 is strongly based on the IEC 62056 series established by CEN/TC 294, whereas PLC standards in the IEC 61334 series are using the CENELEC A-band specified by CLC/TC 205 and its subcommittee CLC/SC 205A.

***Recommendation 2*: Proposed main responsibility: CEN/TC 294**
It is already recognised that CEN/TC 294 will need to co-operate with CLC/TC 13, ETSI ERM TG28, and CLC/TC 205.

***Recommendation 3*: Proposed main responsibility: CLC/TC 205**
CLC/TC 205 stands for Home and Building Electronic Systems, and is able to deal with Smart Metering Network aspects in home as well as buildings.

For the purpose of the mandate, only approved EN standards shall be considered in the first instance. International standards not approved in Europe, as well as Consortia specifications may serve as reference only, and their use as input shall be taken into account during the work in the technical bodies. Listing one could possibly exclude another.

***Recommendation 4*: Proposed main responsibility: ETSI M2M**
It is recognised that close co-operation with CLC/TC 13 will be necessary.

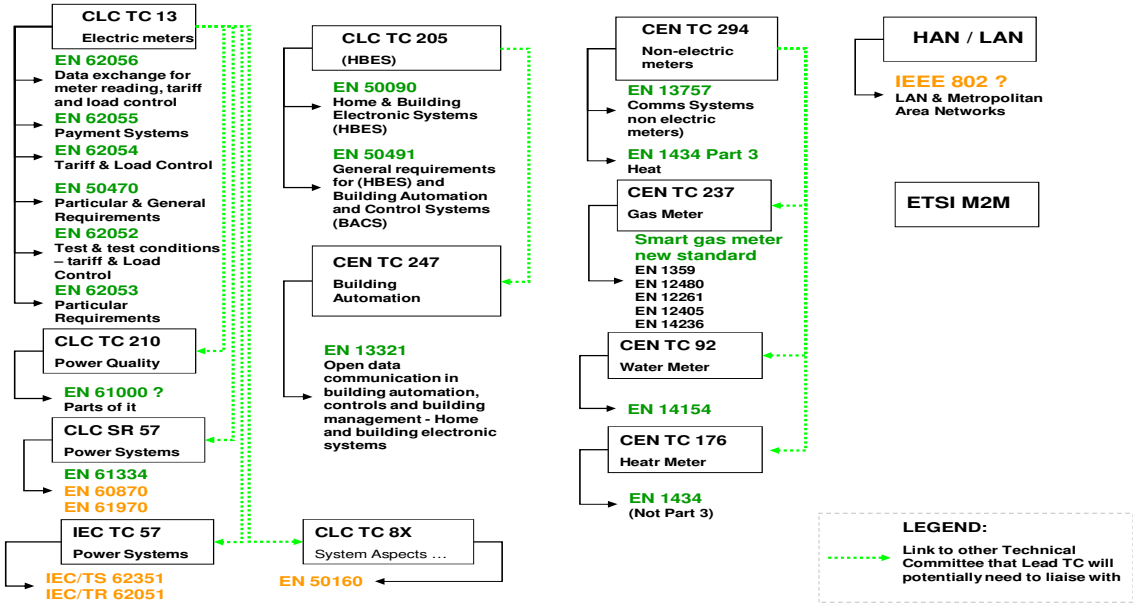
8.3 Standardization recommendations: Additional Functionalities

***Recommendation 5*: Proposed main responsibility: CLC/TC 13**
CLC/TC 13 will need to co-operate with CLC/SR 57 and CLC/TC 210

***Recommendation 6*: Proposed main responsibility: CEN/TC 294**
CEN/TC 294 will need to co-operate with CEN/TC 237 CEN/TC 92 and CEN/TC 176

***Recommendation 7*: Proposed main responsibility: CLC/TC 205**
CLC/TC 205 will need to co-operate with CEN/TC 247

A fuller picture of liaison between technical committees is shown in the diagram below, with output being consolidated where appropriate.

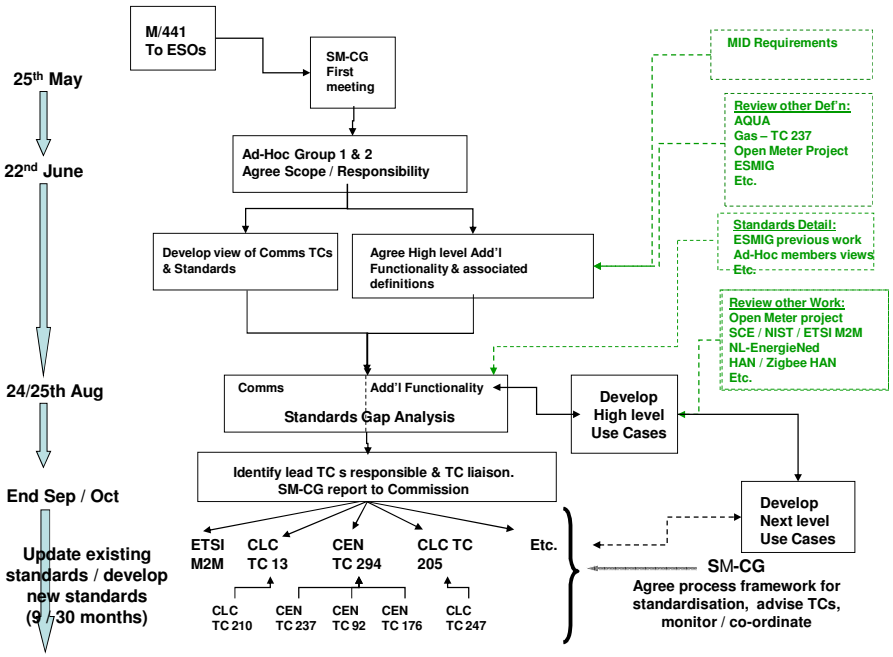


9. Next steps

9.1 Proposed work programme

The following diagram provides an overview of the process by which this response to Mandate M/441 has been prepared, and shows using the example of the additional functionalities area the way in which the standardization work is allocated to lead ESOs /Technical bodies and supported by other technical bodies.

(Table under revision - to be updated with November report release)



9.2 Process

The technical bodies are responsible for the detailed standardization work which will follow presentation of this work programme and in some cases have already taken steps to address the issues identified. While lead technical bodies have been nominated and tasks allocated, it is essential that there is liaison between technical bodies where topics are of common interest and that consensus is reached among all technical bodies involved in a particular area so that the resultant standards are suitable for all the applications covered – electricity, gas, heat and water.

9.3 SM-CG

The work of the SM-CG has been helpful in developing a shared appreciation and understanding of the task and in bringing together the many stakeholders affected by smart metering standardization. These include European representatives of the industries concerned, federations and regulatory bodies.

As originally envisaged, members of the SM-CG will continue to act as a joint advisory group during the standardization process, to help ensure transparency for the many parties involved, to monitor progress against an overall work programme, to help clarify non-technical questions for the technical bodies, and to provide a focal point for co-ordination as necessary and consideration of common issues.

This approach will also ensure the ESOs are kept advised of developments and changing priorities in the industries concerned, in the regulatory framework or in other areas which may be relevant to the smart metering standardization process and can support the Joint Presidents' Group by advising on matters where there are difficulties or conflicts.

9.4 Timetable

A detailed timetable for the work has yet to be developed by the ESOs so the following is illustrative ***[to be developed]***. It is envisaged that a draft timetable would be produced and considered by members of both groups at the meeting at the end of October [23rd?] and formally adopted by SM-CG in early November [9th?].

Noting the point in the Mandate about the importance of transparency during the process of developing standards, the timetable would incorporate periodic sessions with the SM-CG to ensure that stakeholders are kept informed of progress and that they can advise the ESOs on smart metering developments and opportunities for dialogue.

11. TABLES

Table 1 - High level additional functionalities

1. Remote reading of metrological register(s) and provision to designated market organisation(s)[2]			**Applicability[3]** (subject to sufficient power source availability in the case of gas, heating/cooling and water)			
	Explanation	**Customer and other benefits**	**Electricity**	**Gas**	**Heating/cooling**	**Water**
(a)	Meter readings and other metrological data recorded at the customer's premises, which are made available to designated market organisation(s) at a pre-defined time schedule and on request	Potential for more frequent meter reading, leading to bills that better represent actual consumption. Reduction/elimination of estimated bills, a significant source of customer complaints. Supplier is able to provide end user customer with better and more timely information on consumption (and costs); awareness helps consumers to better manage their usage. Improvements in customer	Yes Priority 1[4]	Yes Priority 1	Yes Priority 1	Yes Priority 1

[2] The phrase 'designated market organisation' means a player who is entitled to have access to customer specific information e.g. by legal or regulatory rule

[3] The table refers only to 'meters', which are used for charging purposes. Sub-meters are used in a number of Member States, although functionalities and applications may be limited where sub-meters are used.

[4] This table does not seek to comment on the importance which Member States may attach to inclusion of a particular smart metering functionality. References to Priorities 1 and 2 in this table indicate solely the importance of ensuring that suitable standards are in place for that functionality.

		service and to the change of supplier (switching) process. Also permits improvements in construction of load profiles for typical classes of customers.				
(b)	Includes export metering (i.e. provision of consumption and injection data and on net flows exported)	Facilitation of distributed generation, including solar and wind. Could also be used where water exported from a property	Yes Priority 1	No n/a	Yes Priority 2	Possible Priority 2

2. Two-way communication[5] between the metering system and designated market organisation(s)			**Applicability** (subject to sufficient power source availability in the case of gas, heating/cooling and water)			
	Explanation	**Customer and other benefits**	**Electricity**	**Gas**	**Heating/cooling**	**Water**
(a) Metering system to designated market organisation(s)	Uploading of data and information to permit e.g. monitoring of supply quality, outages (electricity), network leakage detection (water) and identification of possible meter malfunction - tamper and fraud detection - diagnostics (mainly for electronic components) - meter / metering system status (e.g. battery	Improved monitoring of customer service More timely identification of suspected fraud, whose costs can be borne ultimately by end user customers and network losses (water). Improved industry data and meter management Reduction of waste due to incorrectly sized or blocked	Yes Priority 1	Yes Priority 1	Yes Priority 1	Yes Priority 1

[5] Note that even though some data exchange with the meter is generally necessary to retrieve information on metrological registers, remote meter reading is considered as one-way communication throughout this table.

	condition credit/prepayment mode) Also identification of incorrectly sized or blocked meters (water)	meters (water)				
(b) Designated market organisation(s) to metering system	Downloading data[6] to metering system to enable e.g.: - remote configuration of the meter or parameters used by the meter/metering system - clock synchronisation - software and firmware updates	Reduction in need for visits to customer premises, and thus reduced servicing costs	Yes Priority 1	Yes Priority 1	Yes Priority 1	Yes Priority 1
(c) Designated market organisation(s) to customer i.e. where messages/information shown on metering system. See also 6 (a) below.	Ability of the metering system to receive messages from designated market organisation(s), both standard and ad hoc, e.g. on planned interruptions, messages on price changes) and to receive information (incl. account information)	Communication of customer information on a timely basis e.g. price changes Improved customer service and customer accounting information	Yes Priority 1	Yes Priority 1	Yes Priority 1	Yes Priority 1

[6] Downloads only permissible in areas outside legal metrological control and where there is no influence on the flow measurement data or registers

3. Meter supporting advanced tariffing and payment systems			**Applicability** (subject to sufficient power source availability in the case of gas, heating/cooling and water)			
	Explanation	**Customer and other benefits**	**Electricity**	**Gas**	**Heating/cooling**	**Water**
(a) Prepayment[7]	Metering system to support prepayment (and other payment) options May also permit credit/prepayment switching	Facilitates wider use of pay-as-you-go payment systems which can help customers to better monitor / manage their household budget. Potential to reduce costs of prepayment to industry and customer	Yes (subject to satisfactory resolution of safety issues) Priority 1	Yes (subject to satisfactory resolution of safety issues) Priority 1	Yes Priority 1	Possible Priority 2
(b) Multiple rate tariffs	Use of multiple registers within meter or recording of interval reads (See also 1 (b) above on export metering)	Enables more sophisticated tariffs e.g. time of use tariffs and other customer offers related to usage	Yes Priority 1	Yes Priority 2	Yes Priority 1	Possible Priority 2

[7] 'Prepayment' refers to meters which enable the customer to 'pay as they go' for energy consumption.
The main features of such a payment system are:
a) a mechanism for purchasing an amount of energy in advance, including a record of the transaction
b) the transfer of information to update a register in the meter which measures the consumption of the energy purchased
c) a means of setting the rate of such register (this may include a settable facility to recover past debt).
d) a display indicating how much of the purchased energy (including any 'unspent' amount previously purchased) remains at any time thereafter including display of 'warnings' in relation to points (e) and (f) below
e) a means of interrupting the supply when all purchased energy has been used and reconnecting it when more energy is purchased
f) a facility to allow some settable 'leeway' in exceeding the purchased amount (i.e. an 'emergency credit'), usually to restore supply temporarily after interruption
g) a facility to disable prepayment and revert to credit mode, and to activate/reactivate prepayment from credit mode

4. Meter allowing remote disablement and enablement of supply			**Applicability** (subject to sufficient power source availability in the case of gas, heating/cooling and water[8])			
	Explanation	**Customer and other benefits**	**Electricity**	**Gas**	**Heating/cooling**	**Water**
(a)	Remote connection / disconnection and	Possibility of remote disconnection could encourage payment and reduce debt build-up, so reducing costs to industry and customer of providing prepayment facilities Remote closing of the valve can also be useful in case of accidents and to prevent unsafe early self-reconnection after loss of gas supply. Possibility of more flexible/cheaper debt policies and change of tenancy arrangements	Yes (subject to satisfactory resolution of safety issues) Priority 1	Yes (subject to satisfactory resolution of safety issues, in particular where property unoccupied) Priority 1	Yes Priority 2	Technically feasible but not permitted in many Member States
	Remote flow/power limitation	May also permit management of maximum capacity by network operator, supplier or end user customer Above linked to advanced tariffing and payment systems (see above)	Yes Priority 1	No n/a	Yes Priority 2	Possible Priority 2

[8] Note: Power limitations e.g. in the case of water meters may mean valve has to be activated by a separate system

5. Communicating with (and where appropriate directly controlling) individual devices within the home/building			**Applicability** (subject to sufficient power source availability in the case of gas, heating/cooling and water)			
	Explanation	**Customer and other benefits**	**Electricity**	**Gas**	**Heating/cooling**	**Water**
(a)	Used by the network operator AND/OR the supplier for remote load management applications - by means of a local energy management system or home/building control system - where appropriate by direct control of individual devices within the home/building	Permits demand side management and (for the network operator) improved system efficiency Can be combined with remote load limitation	Yes Priority 2 (subject to satisfactory resolution of safety issues) Priority 2	Technically possible but subject to satisfactory resolution of safety issues	Yes Priority 2	Yes (by network operator only) Priority 2
(b)	Used by customer for remote control of individual devices	Possibility of customer control may improve energy conservation and energy management	Yes Priority 2	Yes Priority 2	Possible Priority 2	No n/a
(c)	Used by customer[9] for information on individual appliance consumption information from microgeneration device(s) on gross electricity generated	Improved information and control should encourage energy conservation and energy management Information on gross electricity generated will support microgeneration	Yes Priority 1 Yes Priority 2	Yes Priority 1 No	Yes Priority 1 No	Yes No

[9] Note: Providing the customer with information on individual appliance consumption can be seen as adding to the general functionality described in section 6 (a) below.

6. Meter providing information via portal / gateway to an in-home/building display or auxiliary equipment[10]			**Applicability** (subject to sufficient power source availability in the case of gas, heating/cooling and water)			
	Explanation	**Customer and other benefits**	**Electricity**	**Gas**	**Heating/cooling**	**Water**
(a)	Interfacing with home communications systems / home area network Enables meter to export metrological and other information for display and potential analysis Potential for home and building control applications and sophisticated energy management systems - see also 5 (d) above. [In-home/building displays may also be preferable for information noted in 2 (c) above]	Permits easier and more frequent access by customer to metering, consumption, billing, profile data etc. and customer messages. Information can be used by customer to better manage his consumption Improved information should encourage energy conservation and may assist customer switching In water, can assist leakage detection.	Yes Priority 1	Yes Priority 1	Yes Priority 1	Yes Priority 1

[10] Note: This section envisages meter readings and other metrological data being provided directly within a local area network to a display or other device, in order to assist the customer to better manage his overall consumption. In circumstances where battery life is critical, the information from the meter/metering system may instead be made available to designated market organisation(s) as in section 1 of this table, and analysis provided to the customer by means such as the internet.

Table 2 : Definitions of additional functionalities and key supporting references

Functionality	General definition[11]	Supporting references
1. Remote reading of metrological register(s)and provision of these values to designated market organisation(s)	Metering system capability to provide at a distance the designated market organisation(s) with the value of the meter register(s) through a standard interface at a pre-defined time schedule or on request.	EN 13757 (Communication systems for meters and remote reading of meters, other than electricity); EN 61968 (Application integration at electric utilities - system interfaces for distribution management); EN 1359 (Gas meters – diaphragm gas meters) EN 12261 (Gas meters – turbine gas meters) EN 12405-1 (Gas meters – conversion devices – Part 1 volume conversion) EN 12480 (gas meters – rotary displacement gas meters) EN 14236 (Ultrasonic gas meters) EN 1434 (Heat Meters); EN 14154 (Water Meters) EN 60870 (Telecontrol equipment and systems) IEC 62351 (Power System Management and associated information exchange – information security) EN 62052 Electricity metering equipment (AC) – General requirements, test and test conditions EN 62053 Electricity metering equipment (AC) – particular requirements including metrology EN 50470 Electricity metering requirements (ac) – General and particular requirements (EN version of IEC 62052/IEC 62053 to comply with MID EN 62056 Electricity metering – Data exchange for meter reading, tariff and load control): EN 62056-61, EN 62056-62 – data model standards EN 62056-21, EN 62056-31, EN 62056-42, EN 62056-46, EN 62056-47, EN 62056-53 – protocol standards EN 61334-4-41 (Data communication protocols – DLMS standard, on which 62056-53 is based); EN 61334-4-42 (Application layer) IEC 61334-5-1 (S-FSK PLC) IEC 61334-5-2 (FSK profile)

[11] Note: This is intended as a simple description of each functionality, to assist identification of relevant standards. More detailed definitions explaining the meaning of particular terms will be necessary to support development of appropriate standards, potentially by means of a glossary.

		Other documents include: *NTA 8130 (Dutch Smart Meter specification and tender dossier)* *SRSM (ERA UK Smart Meter Specification)* *292/06 (Italian Smart Electricity Meter Requirements)* *155/08 (Italian Smart Gas Meter Requirements)* *OMS (German MUC Open Metering System)* *FNN: Lastenheft MUC – Multi Utility Communications* *DLMS UA 1000-1: 2009 Ed. 9.0, COSEM Identification system and Interface classes "Blue Book"* *DLMS UA 1000-2:2007, Ed. 6.0 DLMS/COSEM Architecture and protocols, "Green Book"*
2. Two-way communication between the metering system and designated market organisation(s)	Capability of the metering system to retrieve at a distance data on e.g. usage, network and supply quality, events, network or meter status and non-metrological data and to make this data available to the designated market organisation(s); Ability of the designated market organisation(s) to configure the metering system at a distance and to carry out firmware/software upgrades. Ability of the metering system to receive information – for example information sent from the supplier (and/or via relevant third parties e.g. distribution system operator or metering operator) to the end user customer.	IEEE 802 (Local Area Network standards and Metropolitan Area Network standards) EN 13757 (Communication systems for meters and remote reading of meters, other than electricity) EN 50160 (Power Quality), EN 60870 (Telecontrol equipment and systems) IEC 62051:1999 (Electricity metering – Glossary of Terms) IEC 62051-1:2004 (Electricity metering - Data exchange for meter reading, tariff and load control. Glossary of Terms) EN 62056 (Electricity metering - Data exchange for meter reading, tariff and load control EN 61334-4-41 (Data communication protocols); EN 61334-4-42 (Application layer) IEC 62351 (Power systems management and associated information exchange - Data and communications security) *Other documents include:* *NTA 8130 (Dutch Smart Meter specification and tender dossier),* *SRSM (ERA UK Smart Meter Specification),* *292/06 (Italian Smart Electricity Meter Requirements),* *155/08 (Italian Gas Electricity Meter Requirements),* *OMS (German MUC Open Metering System);* *FNN: Lastenheft MUC – Multi Utility Communication* *DLMS UA 1000-1: 2009 Ed. 9.0, COSEM Identification system and Interface classes "Blue Book"* *DLMS UA 1000-2:2007, Ed. 6.0 DLMS/COSEM Architecture and protocols, "Green Book"*

3. Meter supporting advanced tariffing and payment systems	Support for payment systems: Capability of the metering system to allow the customer to prepay for usage by suitable payment means, to connect a supply and disconnect it after a predetermined consumption or certain time duration. Support for tariffing: Metering system provided with multiple rate registers for consumption (and where applicable) injection to allow e.g. for time of use tariffs, critical peak, real-time pricing or combinations of these.	IEC 62051:1999 (Electricity metering – Glossary of Terms) IEC 62051-1:2004 (Electricity metering - Data exchange for meter reading, tariff and load control. Glossary of Terms) IEC 62056 (Electricity metering - Data exchange for meter reading, tariff and load control) EN 62052 (Electricity metering equipment (AC) - General requirements, tests and test conditions) EN 62054 (Electricity Metering Tariff and Load Control) EN 62055-31 (Electricity metering – Payment Systems) EN 62056 Electricity metering – Data exchange for meter reading, tariff and load control) *Other documents include:* *NTA 8130 (Dutch Smart Meter specification and tender dossier)* *SRSM (ERA UK Smart Meter Specification)* *292/06 (Italian Smart Electricity Meter Requirements* *155/08 (Italian Gas Electricity Meter Requirements)* *OMS (German MUC Open Metering System)* *FNN: Lastenheft MUC – Multi Utility Communication* *DLMS UA 1000-1: 2009 Ed. 9.0, COSEM Identification system and Interface classes "Blue Book"* *DLMS UA 1000-2:2007, Ed. 6.0 DLMS/COSEM Architecture and protocols, "Green Book"*
4. Meter allowing remote disablement and enablement of supply	Capability of the metering system to allow the designated market organisation(s) at a distance to safely control or configure supply limitation (not gas), enable and disable supply through configurable parameters set at the meter.	IEC 62051:1999 (Electricity metering – Glossary of Terms) IEC 62051-1:2004 (Electricity metering - Data exchange for meter reading, tariff and load control. Glossary of Terms) EN 62055-31 (Electricity metering – Payment systems), covering requirements and tests for load switch EN 62056 (Electricity metering - Data exchange for meter reading, tariff and load control) EN 61334-4-41 (Data communication protocols) EN 61334-4-42 (Application layer); *Other documents include:* *NTA 8130 (Dutch Smart Meter specification and tender dossier)* *SRSM (ERA UK Smart Meter Specification)* *292/06 (Italian Smart Electricity Meter Requirements)* *155/08 (Italian Gas Electricity Meter Requirements)* *OMS (German MUC Open Metering System)*

		FNN: Lastenheft MUC – Multi Utility Communication *DLMS UA 1000-1: 2009 Ed. 9.0, COSEM Identification system and Interface classes "Blue Book"* *DLMS UA 1000-2:2007, Ed. 6.0 DLMS/COSEM Architecture and protocols, "Green Book"*
5. Communicating with (and where appropriate directly controlling) individual devices within the home/ building	Capability of the metering system to securely exchange data with home and building or energy management systems and where appropriate with individual devices within the home/building (e.g. air conditioners, heaters, boilers) .	IEEE 802 (Local Area Network standards and Metropolitan Area Network standards); EN 13321 (Open data communication in building automation, controls and building management - Home and building electronic system); EN 14908 (Open data communication in building automation, controls and building management –Protocol, Twisted Pair, PLC specification IP) EN 60870 (Telecontrol equipment and systems (Protocols, etc.) EN 62056-31 (Euridis Bus) EN 60079 Safety requirements specification standards series – explosive atmospheres EN 62056 (Electricity metering – data exchange for meter reading, tariff and load control EN 61334-4-41 (Data communication protocols) IEC 61334-4-42 (Application layer) ISO/IEC 14543 (Information technology - Home electronic system (HES) architecture); EN 50090 (Home and Building Electronic Systems (HBES)) *Other documents include:* *OMS (German MUC Open Metering System)* *FNN: Lastenheft MUC – Multi Utility Communication* *NTA 8130 (Dutch Smart Meter specification and tender dossier)* *DLMS UA 1000-1: 2009 Ed. 9.0, COSEM Identification system and Interface classes "Blue Book"* *DLMS UA 1000-2:2007, Ed. 6.0 DLMS/COSEM Architecture and protocols, "Green Book"*
6. Meter providing information via portal / gateway to an in-home/building display or to auxiliary equipment	Capability of the metering system to provide information on total usage, injection and other metrological and non-metrological data for external visual display.	EN 61970 (Energy management system application program interface (EMS-API)) IEEE 802 (Standards for LAN and Metropolitan Area Network EN 62056 (Electricity metering – data exchange for meter reading, tariff and load control EN 61334-4-41 (Data communication protocols) IEC 61334-4-42 (Application layer)

		Other documents include: *FNN: Lastenheft MUC – Multi Utility Communication* *NTA 8130 (Dutch Smart Meter specification and tender dossier)* *SRSM (ERA UK Smart Meter Specification)* *292/06 (Italian Smart Electricity Meter Requirements)* *DLMS UA 1000-1: 2009 Ed. 9.0, COSEM Identification system and Interface classes "Blue Book"* *DLMS UA 1000-2:2007, Ed. 6.0 DLMS/COSEM Architecture and protocols, "Green Book"*

Note; Standards development should also take account of:
WELMEC Guide 7.1 – Software Requirements on the Basis of the Measuring Instruments Directive (MID),
WELMEC Guide 7.2 – Software Guide (Measuring Instruments Directive 2004/22/EC),
WELMEC Guide 11.1 - Measuring Instruments Directive 2004/22/EC – Common Application for Utility Meters, and
OIML D31 - General requirements for software controlled measuring instruments

12. ANNEXES

Annex 1: M/441:

EUROPEAN COMMISSION
ENTERPRISE AND INDUSTRY DIRECTORATE-GENERAL

New Approach Industries, Tourism and CSR
Construction, Pressure Equipment, Metrology

Brussels, 12th March 2009
M/441 EN

Standardisation mandate to CEN, CENELEC and ETSI in the field of measuring instruments for the development of an open architecture for utility meters involving communication protocols enabling interoperability

Objective

The general objective of this mandate is to create European standards that will enable interoperability of utility meters (water, gas, electricity, heat), which can then improve the means by which customers' awareness of actual consumption can be raised in order to allow timely adaptation to their demands (commonly referred to as 'smart metering').

Background and justification

The Competitiveness Council on 25 September 2008[1] underlined that, in general, lack of standards, or the slow updating of existing standards hamper the uptake of innovation, whilst standardisation that is lively and strong has the power to accelerate the access of innovation to both domestic and global markets. It underlined the need for standardising bodies to act in a coordinated manner to promote European standards, to take better account of convergence of technologies and to involve all parties concerned in the a transparent manner. The Council invited industry and other stakeholders to accelerate their cooperation in the development, implementation and use of standards supporting innovation in relation to the sustainable industrial policy and other areas particularly relevant for innovation. It also recommended fully utilising synergies.

Directive 2006/32/EC on energy end-use efficiency and energy services[2] concerns achieving an overall indicative energy savings target by each Member State. National energy efficiency action plans showing how the target is to be met must be prepared by Member States, as provided for by the Directive. Article 13 mentions the need for providing final consumers with competitively priced individual utility meters that accurately reflect the final customer's actual energy consumption and that provide

[1] Council Conclusions on standardisation and innovation , Competitiveness Council of 25 September 2008, http://ec.europa.eu/enterprise/standards_policy/standardisation_innovation/doc/councilconclusions_20080925_en.pdf

[2] OJ L 114/64 of 27.04.2006

Responsible person: Daniel Henekuyk (daniel.henekuyk@ec.europa.eu)

information on actual time of use, in so far as it is technically possible, financially reasonable and proportionate in relation to potential energy savings.

Article 13 of Directive 2006/32/EC is a performance-related requirement which must be satisfied as fully as possible by means of measures which need not be technical specifications.

Directive 2004/22/EC on measuring instruments (MID)[3] concerns full harmonisation of utility meters. It allows all functionalities that do not interfere with the metrological characteristics of the instrument. Most of these functionalities are not subject to any other limitations, i.e. MID allows any specification to be put into use. By means of Mandate M/374 of 20 October 2005 for Standardisation in the field of measuring instruments, CEN and CENELEC were invited to develop standards for utility meters.

There is fast technological development in the area of utility meters to provide customers with the necessary information to empower them through innovative management tools and services to optimize their energy use and to reduce their carbon emissions. It is possible to develop common solutions that enable interoperability which will enable mass production and full competition on the scale of the EU market to reduce the price of highly performing state of the art meters. However, the involvement of many different parties in the absence of harmonisation could result in a multitude of competing technological solutions, which although not fundamentally different, may nonetheless be mutually incompatible thereby fragmenting competition on the internal market. On the other hand, from a competitiveness point of view, Europe could become a market leader should harmonised solutions be developed, hence the need for European standardisation.

Standards already existing at the European level may not be sufficient for a full coverage, although they may be a useful base for future development. Proactive integration of various draft national standards may aid a rapid development.

Description of the mandated work

CEN, CENELEC and ETSI are requested to develop:

1. A European standard comprising a software and hardware open architecture for utility meters that supports secure bidirectional communication upstream and downstream through standardised interfaces and data exchange formats and allows advanced information and management and control systems for consumers and service suppliers. The architecture must be scalable to support from the simplest to the most complex applications. Furthermore, the architecture must consider current relevant communication media and be adaptable for future communication media. The communication standard of the open architecture must allow the secure interfacing for data exchanges with the protected metrological block.

2. European standards containing harmonised solutions for additional functionalities within an interoperable framework using where needed the above-mentioned open architecture for communication protocols. These solutions must be

[3] OJ L 135/1 of 30.04.2004

standardised to achieve full interoperability. Solutions meant to be installed in living quarters should be silent, non-intrusive and safe.

3.

The standards to be developed must be performance-based and permit innovation in the protocols that enable remote reading of utility meters and advanced information and management services for consumers and suppliers. In particular, the standards shall permit fully integrated instruments, modular and multi-part solutions. Standards developed under this mandate and M/374 should not conflict with each other and other standards and any overlaps should be indicated.

CEN, CENELEC and ETSI should take into account international, European and national standards that have already been developed or are under development.

Execution of the mandate

CEN, CENELEC and ETSI shall present a work programme to the European Commission within 3 months of the acceptance of the mandate. This work programme shall include the precise time schedules for the work as well as a full list of the European standards to be developed for additional functionalities. After notifying the Standing Committee under Directive 98/34/EC, the European Commission will without delay inform CEN, CENELEC and ETSI of the proposed standards it accepts as being covered by this mandate.

The deliverables shall nevertheless be presented to the European Commission as follows:

a. The European standard for communication shall be presented within 9 months of the acceptance of the mandate.
b. The harmonised solutions for additional functions (European standards) shall be completed within 30 months of the acceptance of the mandate.

CEN, CENELEC and ETSI shall provide a combined progress report on the mandated work by the end of October 2010.

It is requested that deliverables indicate where they cover requirements which are necessary to comply with Directive 2004/22/EC (notably Annex I points 7.6, 8.1-8.5 and 10.5). Also deliverables should take into account applicable legal requirements concerning the confidentiality of personal data protected under Directive 95/46/EC[4] and Directive 2002/58/EC[5].

Given the many parties involved, e.g. consumers, instrument producers, third party instrument owners, transportation monopolies and energy suppliers, special attention should be paid to transparency during the process of developing these standards.

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[4] OJ L 281/31 of 23.11.1995.

[5] OJ L 201/37 of 31.7 2002.

CEN, CENELEC and ETSI shall take the utmost account of any relevant developments in international standardisation when working on this mandate.

Acceptance by CEN of this mandate starts the standstill period referred to in Article 7 of the Directive 98/34/EEC of 22 June 1998[6].

Organisations to be involved

As appropriate, CEN, CENELEC and ETSI will invite the representative organisations of consumers' interests (ANEC), environmental protection (ECOS), workers (ETUI-REHS) and small and medium-size enterprises (NORMAPME) to take part in the standardisation work.

CEN, CENELEC and ETSI shall also invite WELMEC (authorities of member states) and the Open Meter Project, in so far as it is relevant for the development of standards requested by this mandate, to take part in the work.

[6] OJ L 204/37 of 21.7.1998

Annex 2: Third Energy Package legislation – 2009/72/EC and 2009/73/EC

2009/72/EC: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:211:0055:0093:EN:PDF

2009/73/EC: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:211:0094:0136:EN:PDF

Annex 3: Smart Meters Co-ordination Group – Terms of Reference

Terms of Reference for the Smart Meters Co-ordination Group (SM-CG)

Objective

The Smart Meter Co-ordination Group (SM-CG) is a joint advisory group of the European Standards Organizations (ESOs) with the participation of the various organizations mentioned under "Membership" below. The Group will provide a focal point concerning smart meter standardization issues in respect to Mandate M/441 to CEN, CENELEC and ETSI in the field of measuring instruments for the development of an open architecture for utility meters involving communication protocols enabling interoperability.

The work programme proposed by the SM-CG will include the expected time schedule for the work for the list of the European standards and other documents to be developed.

Tasks

The SM-CG shall:

Clarify non-technical questions to avoid unnecessary discussions in technical groups.

Provide the list of proposed European Standards and other consensus based deliverables to be developed by the ESOs for smart meter functionalities related to the execution of the programmes required by the mandate and propose the work programme for approval by the ESOs for onward transmission to the EC.

Provide comments and recommendations to the European Standardization Organizations, related to smart meter standardization, covered by the current mandate.

Make proposals for the allocation of work.

Provide a suitable platform for discussion of smart meter standardization-related issues with the European Commission and EFTA.

Following acceptance of the work programme by the European Commission, consider (as part of mandate Phase 2) issues related to its implementation, monitor progress and provide necessary recommendations during phase 2 of the mandated work.

The SM-CG shall not itself produce any draft standardization deliverables.

Participation

SM-CG shall comprise representatives of relevant Technical Committees and other standards groups in the European Standardization Organizations, representatives of European industry associations and federations and regulatory bodies, of interested stakeholder bodies, and of EU and EFTA.
Following is the list of those invited to participate:

Industries, federations, regulatory bodies - one representative:
AIE
AQUA
ERGEG/CEER
ESMIG
EUREAU
EURELECTRIC
EUROGAS
EVVE
FACOGAZ
KNX Association
MARCOGAZ
OIML
T&D Europe
WELMEC
Open Meter Project

European Social Partners: ANEC, ECOS, ETUI-REHS, NORMAPME
Technical Committees – chairman or representatives of Technical Committees of the ESOs, including but not limited to:
CEN/TC 92 “Water meters”
CEN/TC 171 “Heat cost allocation”
CEN/TC 176 “Heat meters”
CEN TC 234 “Gas infrastructure”
CEN/TC 237 “Gas meters”
CEN/TC 294 “Communication systems for meters and remote reading of meters”
CEN/TC 318 “Hydrometry”
CEN/WS DPP (Data Protection and Privacy)
CLC/SR 57 - "Power systems management and associated information exchange”
CLC/TC 8X “System aspects of electrical energy supply”
CLC/TC 13 “Equipment for electrical energy measurement and load control”
CLC/TC 59X “Consumer information related to household electrical appliances”
CLC/SR 69 “Electric road vehicles and electric industrial trucks”
CLC/TC 205 “Home and Building Electronic Systems”
CLC/SC 205A “Mains communicating systems”
CLC/TC 210 “Electromagnetic Compatibility (EMC)”
CLC/TC 215 “Electrotechnical aspects of telecommunication equipment”
ETSI/TC M2M “Machine to Machine Communications”
ETSI/TC TISPAN “Telecoms and Internet converged Services and Protocols for Advanced Networks”
ETSI/TC ATTM “Access, Terminals, Transmission and Multiplexing”

ETSI/TC ERM “EMC and Radio Spectrum Matters”
ETSI/TC PLT “Powerline Telecommunications”

EC (European Commission)
EFTA (European Free Trade Association)

There will also be representatives of the CEN Management Centre, CENELEC Central Secretariat and ETSI Secretariat.

Other representatives of relevant stakeholders may be invited as required by agreement of the Group, to partake in the SM-CG meetings on an ad hoc basis.

Chairmanship

The group shall be chaired by a person from one of the participants, nominated by the Group, and appointed by the CEN/CENELEC/ETSI Joint Presidents’ Group. The Chairman’s role is to facilitate the SM-CG work in a neutral way. The Chairman shall not be considered as a representative of any of the participating organizations.

Secretariat

The Secretariat of the SM-CG will be provided by one of the ESOs.

Management and Working Methods

The SM-CG shall meet physically as required; full electronic working facilities in terms of an e-mail exploder and/or ftp server shall be provided by the Secretariat.

In order to ensure an effective operation, the Group may decide on the creation of advisory groups of 6 to 10 [max] participants on specific topics, which shall take the responsibility on a voluntary basis to drive the work forward, prepare input documents, etc.

The SM-CG shall work by consensus. It will function under the umbrellas of the CEN and CENELEC Technical Boards and ETSI Board in terms of the follow-up of activities. In the event of difficulties, the ESOs will seek to resolve them in consultation with the relevant interested parties. The CEN/CENELEC/ETSI Joint Presidents’ Group shall act as the final arbiter.

The SM-CG may disseminate recommendations and advice to its members, and/or other involved stakeholders. The SM-CG may organize open meetings, including for consultation on the proposed draft work programme.

The SM-CG is not a legal entity and all participants shall work on a voluntary basis representing their own organization only and any related cost in participating is to be met by each participant.

Annex 4: Smart Meters Ad Hoc Group 1 "Communication" – Scope and Participation

SMCG_AHG1_Sec0001

Smart Meters Co-ordination Group

Ad hoc Group on Communication

DRAFT SCOPE OF WORK and PARTICIPATION

1. **To provide benchmarks/mapping of existing standards and initiatives**

2. **To generate and provide an overall architecture on communication objects**

3. **To generate and provide an overall architecture on communication elements**

4. **Prepare a report evaluating available standardized meter protocols being used in Europe and**

   - **identify possible gaps to a common standard,**
   - **analyse existing proposals for amendments,**
   - **start implementation of gap filling amendmends**

5. **Make recommendations on interoperability, openness and legal precondictions in member states (such as frequency regulation, EMV regulation etc.),**

Participants: CLC/TC 13, CLC/TC 205, CLC/TC 215, CEN/TC 294, CEN/CLC Sector Forum on Energy Management, ETSI ERM, ETSI M2M, ETSI PLT, CEER/ERGEG, WELMEC, AIE, AQUA, ESMIG, EVVE, EUREAU, EURELECTRIC, FACOGAZ, KNX Association, Open Meter

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Annex 5: Smart Meters Ad Hoc Group 2 "Additional Functionalities" – Scope and Participation

SMCG_AHG2_Sec0001

Smart Meters Co-ordination Group
Ad hoc Group on Additional functionalities

DRAFT SCOPE OF WORK and PARTICIPATION

1. **To prepare a succinct list of additional functionalities that can be associated with smart metering systems in electricity, gas, heat and water**

2. **To propose a short definition of each functionality**

3. **For each functionality, to identify if a suitable international or EU standard is available.**

   If not, to identify if there is one or more appropriate national standards or specifications (including drafts) which could be of use to support smart metering and future industry arrangements

4. **To highlight the gaps i.e. those functionalities that are not currently addressed by a suitable international or EU standard. National standards/specifications may provide useful information.**

5. **For each functionality, to consider the data required to be communicated**

   - Assess the nature, likely format and frequency of the data for consideration by the Communications Group

6. **To agree on a basis by which it can be determined if functionalities are of a metrological or non-metrological in nature**

7. **To put forward a work programme, which the SM-CG can recommend to the ESOs and their Technical Committees**

   - The objective is to ensure that one or more appropriate EU standards for each functionality are available within the mandated timeframe

   - In the interests of time, the programme will as far as possible draw on existing or current work and consider draft national standards where appropriate.

Note: To assist in the development of the work programme, it may be necessary to focus on a list of the key smart meter functionalities

Participants: CLC/TC 13, CEN/TC 164, CEN/TC 234, CEN/TC 237, CEN/CLC Sector Forum on Energy Management, ETSI M2M, CEER/ERGEG, WELMEC, AQUA, AIE, ESMIG, EUREAU, EURELECTRIC, EVVE, FACOGAZ, KNX Association, MARCOGAZ, EUROGAS, Open Meter.

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Annex 6: Welmec Guide 11.1

http://www.welmec.org/publications/WELMEC_11.1_Issue_3.pdf