Smart Metering Implementation Programme

Publication of the Industry's Draft Technical Specifications

August 2011

1. Introduction

The Government's vision is for every home in Great Britain to have smart energy meters, with businesses and public sector users also having smart or advanced energy metering suited to their needs. The rollout of smart metering equipment will give people far better information about, and control over, their energy consumption and deliver other significant benefits to consumers; for example, it will bring an end to estimated billing and make it easier to switch energy supplier. Smart metering will also play an important role in Britain's transition to a low-carbon economy and help meet some long-term challenges such as ensuring an affordable, secure and sustainable energy supply.

The smart metering proposals have been the subject of considerable attention and extensive consultation, most recently in the *Smart Metering Prospectus* (the Prospectus)[1], jointly published by DECC and Ofgem in July 2010. In March 2011, DECC and Ofgem published a *Response to the Prospectus Consultation* (the Response)[2], which set out the planned approach to the design of the new obligations on energy suppliers to install smart metering equipment.

In the Response, the Government confirmed the high-level functionality that smart metering equipment should achieve, based on an assessment of the costs and benefits to consumers of a given level of minimum functionality (see Table 1 below). The Government also published a *Functional Requirements Catalogue*[3] (the Catalogue), setting out a more detailed description of what the smart metering equipment should deliver. However, the Catalogue did not set out how the equipment should deliver these functionalities.

The Government concluded that technical specifications – based on open, non-proprietary standards, building on the functional requirements (within the Catalogue) – should also be developed and mandated. This stage was considered essential to ensure the technical interoperability of all smart metering equipment, such that it allows consumers to switch suppliers without the need for equipment to be replaced. Technical specifications would also provide certainty to meter manufacturers (who need to develop and produce equipment) and to suppliers (who need to procure equipment). It was announced that draft technical specifications would be completed in July 2011.

The Response noted that the Programme would commission (and facilitate the work of) industry experts to develop the draft technical specifications. Work was carried out through a number of objective-focussed working groups, these included experts from consumer bodies, manufacturers, energy suppliers, network operators and other interested parties (see chapter 2 of this paper for more information and Annex 1 for a list of organisations involved). The Industry's Draft Technical Specifications, published alongside this covering paper, is the main output of this process. The Government intends to adopt technical specifications when it considers that they are of sufficient detail to deliver technical interoperability and smart metering benefits, and are drafted in a manner suitable as the basis for a regulatory obligation

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[1] Smart Metering Prospectus consultation available at: http://www.decc.gov.uk/assets/decc/Consultations/smart-meter-imp-prospectus/220-smart-metering-prospectus-condoc.pdf
[2] Response to the Prospectus Consultation available at: http://www.decc.gov.uk/en/content/cms/consultations/smart_mtr_imp/smart_mtr_imp.aspx
[3] Response to Prospectus Consultation: Functional Requirements Document available at: http://www.decc.gov.uk/en/content/cms/consultations/smart_mtr_imp/smart_mtr_imp.aspx

on suppliers. The Government would like to thank all those involved in the process for voluntarily providing their expertise, commitment and enthusiasm to this task and for delivering the document to such a challenging timetable.

As part of its review, in the coming weeks, Government will launch a consultation on proposed new licence obligations on energy suppliers to rollout smart meters, including the process for adopting technical specifications those meters must meet. Through that consultation, views will be sought on the Industry's Draft Technical Specifications and on a number of specific issues on which Government is particularly keen for further input. Government will undertake further work to ensure that the technical specifications associated with the licence conditions enable the installation of interoperable smart metering equipment in consumer premises in line with the Programme business case and to ensure that the specification is sufficiently precise to be legally enforceable. Following that consultation, and as part of the formal response, it is intended to publish the revised version of the technical specifications alongside final licence modifications.

The Government currently expects that when complete, the technical specifications and associated licence modifications will need to be notified to the European Commission, in line with requirements of the Technical Standards and Regulations Directive (Directive 98/34/EC). This process introduces a mandatory 'stand-still' period of three months before the technical specifications and associated governance obligations and licence obligations can be adopted. There is a possibility for a further three month period if a detailed opinion is received from the European Commission or a Member State following the initial 'stand-still'.

	High level functionality	**Electricity**	**Gas**
Table 1: High-level functionality requirements for smart meter system			
A.	Remote provision of accurate reads/information for defined time periods • delivery of information to customers, suppliers and other designated market organisation	✓	✓
B.	Two way communications to the meter system • communications between the meter and energy supplier or other designated market organisation • upload and download data through a link to the wide area network, transfer data at defined periods, remote configuration and diagnostics, software and firmware changes	✓	✓
C.	Home area network based on open standards and protocols • provide "real time" information to an in-home display • enable other devices to link to the meter system	✓	✓
D.	Support for a range of time of use tariffs • multiple registers within the meter for billing purposes	✓	✓
E.	Load management capability to deliver demand side management • ability to remotely control electricity load for more sophisticated control of devices in the home	✓	
F.	Remote disablement and enablement of supply • support remote switching between credit and prepayment modes	✓	✓ (domestic)
G.	Exported electricity measurement • measure net export	✓	
H.	Capacity to communicate with a measurement device within a microgenerator • receive, store, communicate total generation for billing	✓	

2. How the Programme facilitated industry's work

The Government established the process to develop technical specifications. The work was carried out by the Smart Metering Design Group (SMDG). This group, which includes industry experts, was established to provide advice to the Programme on the development of the smart metering equipment design. The work to develop the Catalogue and the Industry's Draft Technical Specification has required a large amount of commitment from individuals and organisations working on a voluntary basis over recent months.

The Industry's Draft Technical Specifications was developed by working groups operating under the SMDG, each considering individual elements of the specification. The Government established the objectives (see Table 2 below) and terms of reference for each of these groups to focus their work on Programme priorities, achieving interoperability and the Programme's business case.

Having agreed the objectives for each of the working groups, the SMDG sought volunteers from the energy industry, meter and communications manufacturers and other interested parties (for example Consumer Focus) who could contribute both time and expertise, either by chairing or participating in working groups. The SMDG and the Government then reviewed all nominations to ensure that the required expertise was in place and interested sectors were adequately represented within the working groups.

In addition to the technical experts, the six largest energy suppliers provided project management support to work with the programme team to ensure that all areas covered by the smart metering design work received appropriate attention and that the working groups project plans and deliverables were delivered on time. During mid-June 2011 the Programme facilitated a full-time industry 'hot house' to bring together the deliverables of the working groups. This six week process enabled the population of the documents forming the Industry's Draft Technical Specifications.

Table 2: SMDG working groups and objectives	
Working Group	**Objective**
Home Area Network	Define the HAN selection procedure and make recommendations as appropriate
Tariffs	Define the minimum tariff structure to be supported by the smart metering system
Pre-Payment Metering	Define the minimum data items associated with PPM
Application Layer	Define the data items and undertake gap analysis of proposed solutions (e.g. DLMS)
Installation & Maintenance	Define the minimum data items associated with installation and maintenance
Gas Meter Variants	Define the meter variants required for non standard installations such as Radio Tele-Switch, CT, large gas, non domestic
Electricity Meter Variants	Define a meter envelope (includes semi concealed)
Microgeneration	Define the minimum data items associated with Microgeneration, and the procedure for micro-generation on self disconnect
Difficult Property types/ Positions	To understand what would make a property difficult for a smart meter to be installed and to understand the number of these properties that might be expected.
In Home Display	To define the functionality of the minimum specification IHD
Interoperability testing	To identify options for testing and trialling the components of the smart metering system.
Access to Data	To define how consumers and their authorised parties will be able to access consumption data
Data Modelling	To produce a catalogue of data items that the meter will be able to record or transmit.
Gas Meter Battery Life	To understand the operations that will have an impact on the expected life of a gas meter battery. To define what a typical use profile would be and confirm that a 15 year lifespan is achievable
Extended Statement of Design Requirements (ESoDR)	Ensure that technical specifications meet needs of programme, consumers and other stakeholders
Normative References	To identify and catalogue the standards and benchmarks for which adherence to will form part of the functional specification
Architectures	Defining the options for the architectures of the smart metering system.

Security Requirements

Security requirements were developed separately due to the specific expertise required and sensitive nature of the risk analysis undertaken by the Government. The Programme formed a Security Technical Expert Group (STEG) to provide expert advice on designing appropriate levels of security across the end-to-end smart metering system (developed from the high-level requirements outlined in the Catalogue). STEG membership included industry and Government security experts and worked under terms of reference that ensured potentially sensitive information was protected. The STEG initiated two working groups, one to develop the Risk Assessment and the other to focus on developing the Smart Metering Security Requirements.

The Security Requirements developed by this working group that relate to the smart metering equipment within a consumer premises are included in the Industry's Draft Technical Specifications. Members of this working group have assisted with the 'hot house' process in order to resolve any issues where security risks may have an impact.

3. Contents of the *Industry's Draft Technical Specifications*

Architectures

The components of the smart metering system may be purchased by different suppliers or sourced from different manufacturers. Therefore, there needs to be a level of agreement of the architecture(s) (i.e. in which pieces of equipment certain functionalities such as data storage and processing will be carried out) in order to achieve interoperability.

However, in order to allow for specific circumstances, such as the gas meter being installed before the electricity meter, the industry recommended that there will not be one single architecture that will suit all consumer premises. The Architectures Working Group considered the different options for where functionality could be located and have identified a main architecture and two alternatives.

Extended Functional Requirements

The Extended Functional Requirements build on the Catalogue requirements. Additional layers of detail are specified against each requirement. Manufacturers have indicated this is the level of detail required to produce manufacturing specifications and build interoperable meters capable of providing the required functionality. Suppliers have also indicated that this level of detail provides the necessary platform to commence the procurement process for smart metering equipment.

Security Requirements

These requirements set out the security functions that need to be carried out within the smart metering equipment located within the premises. This is in order to provide the appropriate level of security as part of the end-to-end security requirements.

Appendices

Glossary

In order to provide clarity for readers, a glossary of terms used has been developed. This builds on the list of terms identified within the Response.

Normative References

This appendix provides an overview of the standards and Normative documents that are referred to within the Industry's Draft Technical Specifications.

Home Area Network (HAN) – Evaluation Criteria

This appendix details the work done to identify appropriate criteria to select or evaluate potential HAN technologies for the GB Smart Metering Implementation Programme.

Supporting Documents

In addition to the main documents of the Industry's Draft Technical Specifications the following documents have been developed to provide further background and clarity.

Use Cases

The Use Cases document is used to explain how the requirements identified in the Catalogue could be translated into actions that the smart metering system would carry out.

Other documents

These documents provide additional context for the Industry's Draft Technical Specifications and explain how the working groups reached their conclusions. In some cases the output of the working groups do not directly relate to a specific functional requirement but provide further understanding of the issues on which they were asked to focus.

Annex 1: Organisations that participated in the SMDG

Association of Meter Operators (AMO)
British Electrotechnical and Allied Manufacturers Association (BEAMA)
British Gas
Consumer Focus
EDF Energy
Electralink
Electricity Networks Association (ENA)
Energy Retail Association (ERA)
EON UK
Energy Services and Technology Association (ESTA)
First Utility
Gemserv
Good energy
I&C Shippers and Suppliers (ICoSS)
Intellect
Ofcom
RWE npower
Society of the British Gas Industries (SBGI)
ScottishPower
Scottish and Southern Energy (SSE)
Technology Strategy Board (Astutim)
The Application Home Initiative (TAHI)
Utilita
Xoserve