

Disablement / enablement functionality for smart gas meters

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Contents

Introduction	4
Analysis	5
Gemserv Report	5
Impact Assessment.....	5
Technical	6
Costs and benefits	6
Non-quantifiable considerations	7
Summary	8

Introduction

In March 2010 DECC commissioned research and analysis on the issues relating to the inclusion of remote disablement/ enablement functionality for smart gas meters. This followed previous consideration of this issue in the context of the development of high level functionality for smart gas meters. This paper sets out the Government's view following completion of this further work and it should be read in conjunction with the detailed technical and cost benefit work set out in¹:

- Annex 1 of the, *Impact Assessment of a GB-wide smart meter roll out for the domestic sector*, DECC 2010.
- *Analysis on disablement/ enablement functionality for smart gas meters* – for the technical analysis, Gemserv 2010.

The smart meter programme will need a set of minimum functional requirements and technical specifications for smart gas and electricity meters to ensure interoperability so that customers can change supplier without the need for a change of meter.

For gas meters the functional requirement to remotely disable and enable gas supply necessitates the inclusion of a valve in the meter. The valve closes to disable supply and opens to enable the gas to flow again². Similar functionality is currently used by suppliers in prepayment meters to provide prepay services – the valve stops gas when the prepaid amount runs out and allows it to start again when a payment is made. Over 2m meters or 10% of the current gas meter stock, already have valves. Whilst it may be possible for suppliers to offer prepayment tariffs without a valve it is not clear that this would be a commercially attractive approach for many suppliers, because it would remove the capability to stop gas supply when credit has been used. Valve functionality in smart meters also supports benefits associated with remote switching between credit and prepay, as well as remote disconnection which will help to better manage debt in the future.

There is broad agreement amongst stakeholders that where a consumer currently has a prepayment meter this should be replaced with a smart meter with a valve. Stakeholders have, however, previously expressed a range of views on whether Government should mandate a valve as part of the minimum functional requirements for all gas smart meters or whether this should be left to supplier choice. A number of issues have been raised both for and against a universal requirement. DECC therefore commissioned Gemserv to investigate the issues raised. Gemserv's analysis also informed the further economic analysis on the gas valve set out at Annex 1 of the Impact Assessment.

Taking into account responses to previous consultations and calls for information as well as the analysis undertaken by Gemserv the Government's view, subject to any further evidence or submissions received during the consultation closing 28 September 2010, is that the valve should form part of the minimum requirements for all smart gas meters. A requirement for a

¹ All the documents referred to in this paper can be found at:

http://www.decc.gov.uk/en/content/cms/consultations/smart_mtr_imp/smart_mtr_imp.aspx

² Whilst the requirement would not be for a valve itself, for ease of presentation we will use the provision of a valve to mean the high level functional requirement for remote disablement and enablement of gas supply

valve is therefore included in the smart metering system functional requirements as set out in the Statement of Design Requirements Functional Requirements Catalogue³. Any further evidence or comments on the inclusion of a requirement for a valve should be submitted as a response to that consultation document. The closing date for comments on this aspect of the consultation is 28 September 2010⁴.

Analysis

During the first phase of the smart meter implementation programme the Government has undertaken further work on issues relating to the gas valve to deepen our understanding of the range of issues and to test the arguments and robustness of the evidence underpinning them.

Gemserv Report

DECC commissioned Gemserv to conduct an analysis of the full range of issues relating to mandating the disablement / enablement functionality for smart gas meters. Gemserv was asked to:

- review, assess and consolidate the available information, including on costs and benefits;
- test the robustness of the arguments made in relation to the gas valve; and
- examine issues relating to retrofitting, technical capability, safety and maintenance requirements, commercial operations and cost implications across the piece.

As part of its work Gemserv received contributions from some 40 stakeholders including gas suppliers, meter operators and consumer representative groups. Written contributions were supplemented by various bilateral and technical discussions. Key areas and questions considered in Gemserv's final report include the viability of retrofitting, a review of the technical capability of meters with valves, the existing safety regime and network implications. Gemserv also considered experience from the operation of existing prepayment meters and customer interaction with metering. Gemserv also reviewed relevant responses to the consultation document published by DECC in May 2009.

Impact Assessment

DECC has undertaken further cost benefit analysis to assess the economic case for mandating a gas valve for all smart meters. This work was informed by the main findings of the Gemserv report. Gemserv also provided input and advice on the development of the cost benefit analysis contained in the Impact Assessment.

In order to assess the cost benefit case for including a valve in all gas smart meters two options were assessed:

³ Smart Metering Implementation Programme Statement of Design Requirements - (Annex 3) Functional Requirements Catalogue, July 2010

⁴ For details of how to respond to the consultation reference should be made to the Smart Metering Implementation Programme Prospectus, July 2010

- Option A: a “universal” approach where all gas meters must be smart and fitted with valves; and
- Option B: a “supplier choice” approach where the minimum requirement does not include a valve. This allows suppliers to choose the approach they wish to take and to decide for example what percentage of consumers receive a gas meter with a valve or without a valve, and whether to use retrofits.

In assessing the cost benefit case the impact assessment takes into account a wide range of factors. Considerations include the expected deployment of smart meters with valves⁵, the numbers of meters installed without valves and the scope for retrofitting existing non-smart meters⁶. It also considers the take-up of prepayment/ pay-as-you-go (PAYG) tariffs. The impact assessment notes that for some benefits quantification has not been possible. The results of the economic assessment can be found at Annex 1 to the Impact Assessment.

Technical

The Government notes that the central finding in Gemserv's report is that, subject to DECC's economic impact assessment, there are no fundamental technical or safety issues arising from the deployment of gas smart meters with valves⁷. In addition Gemserv concludes that:

- about half of current non-smart meters are technically capable of being upgraded/ retrofitted and retrofit equipment has been demonstrated to work effectively; and
- smart meters with valves could provide a platform for prepay to become a mainstream payment option through the offer of new PAYG tariffs. Consumer Focus research suggests this could amount to 30% of the total market by 2020.

Gemserv's report also highlighted the need for a review of the consumer protections related to the operation and use of a gas smart meter with a valve and for ongoing monitoring of use and performance by the industry. These issues will be taken forward under the smart meter implementation programme. The Smart Metering Implementation Programme Prospectus and supporting document on Consumer Protection provide further information on the approach.

Costs and benefits

Mandating a valve for all gas smart meters will affect both costs and benefits. In terms of the benefits, the capability to remotely enable and disable electricity or gas supply supports benefits related to prepay and debt management for instance making the switch between credit and prepay easier. The remaining quantified gas smart meter benefits (avoided meter reading, back office efficiencies, energy and carbon savings) are achieved without a valve. The inclusion of the valve also supports a number of additional market and consumer benefits, although it was not possible to quantify these as part of the economic analysis.

⁵ Suppliers are expected to install meters with valves in the supplier choice option for a proportion of consumers; to replace existing prepayment meters or because they anticipate take-up of PAYG for some customers or to manage debt.

⁶ Retrofitting involves installing a reading and communications device to the existing non-smart gas meters delivering a proportion of the benefits of gas smart metering by enabling remote meter reading and providing information to consumers.

⁷ Assuming that the main purpose of the valve is to support debt management for both suppliers and consumers by allowing remote and self-disconnection and reconnection. The valve is not a replacement for the existing Emergency Control Valve.

In terms of costs, the valve has a direct impact, adding around £13 per meter to the costs. Allowing flexibility to install a smart gas smart meter without a valve therefore reduces meter asset costs overall if lower-cost smart gas meters without valves are installed. In the absence of a requirement to include a valve suppliers would also have the option of retrofitting existing non-smart gas meters. Retrofit devices cost less and are quicker to install than a new meter, further reducing costs. The use of a retrofit can also reduce stranding costs by extending the useful life of non-smart meters. Ultimately if suppliers are given the choice, then decisions about installing meters with valves and the use of retrofitting will depend on a variety of factors, including suppliers' roll out strategies and commercial drivers. These factors and the assumptions used in the analysis are discussed in more detail in Annex 1 of the Impact Assessment.

The analysis undertaken has used the economic model which assesses all of the aspects of the smart meter roll out, so the results demonstrate the implications of the two gas valve options on the full cost benefit assessment of the whole roll out of smart gas and electricity meters. The analysis indicates that where the gas valve is not mandated and suppliers have choice to install meters (with or without valves) or to install a retrofit device the total benefits of the roll out exceed costs by £5,141m. Where a valve is installed in all smart gas meters benefits exceed costs by £4,989m⁸.

The supplier choice option delivers a marginally higher overall net benefit primarily because it is based on assumptions that suppliers will install some meters without valves and will retrofit some non-smart meters, reducing overall costs. The assumption used about the proportion of gas smart meters with valves installed by suppliers in the choice option is relatively conservative, and the assumption on the level of retrofitting is at the higher end of what is considered economically viable. Increasing the proportion of meters with valves or decreasing the level of retrofitting tends to increase costs for the supplier choice option, narrowing the gap between the supplier choice and universal options. Where a valve is required in all gas smart meters there are some additional benefits, but the extra cost per meter mean that the overall net benefit is lower.

Non-quantifiable considerations

There are a number of other benefits related to the inclusion of a valve in all gas smart meters, which are not quantified in the modelling:

- The services offered across gas and electricity would be the same and customers would be able to opt for PAYG easily and quickly for both fuels, without the need for additional meter exchanges⁹, removing a barrier take-up of new PAYG tariffs.
- Encouraging the growth of PAYG could make this sector of the market more attractive to suppliers, increasing competition within it, as well as removing the perceived stigma of having a prepayment meter.

⁸ The net benefit is calculated by subtracting the total costs from the total benefit, it is given in *net present value* terms over the period 2010-30

⁹ Additional meter exchanges will be needed in circumstances where consumers request PAYG or suppliers need to manage debt, but the installed smart meter does not have a valve

- Suppliers would know what meters they have to procure and install which could reduce some of the complexity around procurement and potentially maximise economies of scale for meter provision.
- For the smart meter roll out achieving technical interoperability is likely to be easier because it will not be necessary to consider developing requirements for retrofit devices.

These are important considerations and deliver benefits for customers and support future market developments. The supplier choice option may create barriers to the realisation of some of these benefits. For instance the need for an additional meter exchange may discourage more widespread take-up of prepay tariffs and the procurement, logistics and installation challenges to support a mixture of technologies (valves, no valves, retrofits) are likely to add complexity to the roll out.

Summary

The universal approach maximises the quantified benefits, but it also adds to costs. Overall the estimated difference in the cost benefit impact between the two options is relatively small in the context of the costs and benefits of the full smart meter roll out at £152m. The universal approach immediately supports a number of important non-quantified benefits for consumers, suppliers and for the smart meter roll out. It supports market developments by providing a better platform for the offer of new prepayment tariffs and enables easily the move from credit to prepay. An important degree of certainty is also provided, simplifying the task of achieving interoperability. Given the scale of the roll out this is considered a significant benefit for suppliers and for the efficient delivery of the roll out. Overall the Government considers that these benefits outweigh the difference in the cost benefit impact.

Any further evidence or comments submitted in response to the consultation on the functional requirements will be considered, however subject to that, on the basis of the analysis summarised in this paper, the Government's view is therefore that the minimum functional requirements for gas smart metering should include functionality for remote disablement/enablement in all smart gas meters.

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