

# **Response to DECC Consultation on Smart Metering**

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### **1 Summary**

We welcome this consultation and the responses it has generated. We have worked with many parties who have also submitted a response and do not intend to repeat our views here. Instead this response will highlight areas which we believe require expansion, where we disagree with the other parties we have worked with, recommendations on methods which are likely to be useful in roll-out, and steps we have taken ourselves to meet these.

Generally we welcome the proposals so far, and have concerns over two main issues;

- 1) the dangers of implementing a replacement roll-out of such size, complexity and with so many dependencies
- 2) the apportionment of benefits to the parties, against who will pay for the services. This appears to be very much in favour of the large energy suppliers over the customer. We do not believe this is appropriate or necessary

We will recommend how some of these concerns may be alleviated.

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## **2 Pilot Systems**

Pilot Systems have been operating for over 20 years in digital fiscal metering software and technology. We defined the way meters communicate in the UK (the FLAG protocol). We specified and implemented the operating system that all meter vendors support for reading and programming (CHIRPS). And we have developed an add-on product (MeterPod™, appendix i) which provides all the smart meter functionality required by both customer and supplier (apart from contactor switching) at a fraction of the installation cost, and independent from the energy suppliers. We also sell and support the Comet optical reader from Zemtec for mechanical meters.

Our product development has been based on a long-term road-map of a near-perfect working meter market. Whilst our recommendations will include the use of our product and services, we only propose these to the extent that such a market can be achieved. A good working metering market is essential with such a size of project spend. We are committed to our technology being used in this market, either from the customer or supplier initiative, because we cannot see an alternative that will provide everything that is proposed within the budget, timescales and risk criteria.

We offer our products directly to the customer as a challenge for the supply industry to meet similar performance and value. We make a plea now that these products are not excluded from the roll-out, even if only to ensure that the energy supplier provides the best value to the customer from a privileged monopoly position.

## **3 Central Communications Model**

We agree that a Central Communications Model is the only practical way forward but recommend the following additional provisions

1. Opportunity for re-tendering in a more distributed/localised model at a future point – e.g. in electricity UKDCS was the sole party in 1994, but this was re-tendered by all the energy suppliers 4 years later in 1998, once the processes had been established
2. Serious consideration to the contract award of a thin service being restricted outside the supply industries commercial interests. Energy suppliers currently have too much control of the benefits (e.g. most half-hourly customers have not seen their data, despite the fact they're paying for it). Communications players such as BT, Vodafone, Orange, etc. are well enough versed in metering to be able to provide a transparent and generic service. The specification for this would be relatively simple, and geared to minimising operation cost against useful data bandwidth. Whilst energy suppliers would pay a contribution for the service (or rather their customers would) this could be as a supply license levy, and controlled independently from them i.e. a government agency or Oftel, so that all the additional benefits of

such a communications system could be realised (e.g. health, fire, security), as well as new energy requirements (micro-generation, electric cars, etc) that may not be able to be considered at the initial roll-out stage. Supplier benefits would be then attributed to how well each individual supplier used the system, and customers would be able to differentiate on this.

It should be noted that UKDCS was jointly owned by the regional electricity companies in 1994, and sold off to IMServ around 1999/2000. Since then most suppliers have pulled back the DC contracts to their own businesses. This has polarised the benefits in favour of the energy suppliers at the expense of the customers, and should be avoided with any Central Communications Model

#### **4 Energy Demand Research Project (EDRP)**

Progress of this is being followed with interest. Generally positive in terms of energy reduction in response to the program, there are a number of obstacles that will certainly be escalated in a full roll-out. The main ones are;

- immature technology. Meter vendors integrating their meter with radio communications, GSM modems and displays to meet the timescales of the project have not been able to deliver proven integrated technology. This indicates that a single source/spec of such a mix of technologies in a short time is dangerous.
- installation difficulties. Problems generally with RF communication to the display, and GSM coverage, indicates a mix of communications types will be needed for roll-out
- customer acceptance and use. Difficulty even after initial customer agreement to get customer to “own and use” the system. The more the customer can opt-in, clearly see what extra he is paying, and how much the technology depends on him, the better his response will be

#### **5 Roll-out**

The only way to do this properly, minimising risk and cost is to do it incrementally. Large scale roll-out should only be done in areas where economies of scale are an issue. There are some things we are certain of, and some that we are not so certain of. For example we know that every premises in the country will need 2-way Wan and Han of a defined (fairly low) bandwidth. This can be implemented centrally. Meter and display functionality we are not so certain of. Benefits to different parties and what they should contribute we are not so certain about. Additional services – we know there are many, but we don't know how they would be implemented. Another uncertainty. The type of Wan communication technology IP, private GSM/GPRS/SMS, power-line are all contenders, and a mix is likely needed to properly secure all installations.

Including communications initially as an add-on is the obvious way to mitigate some of these risks. Add-ons such as the MeterPod™ have different communications options, and radio types, to suit most installation environments, and the popular display interfaces. Making use of this to get the technology mix right is essential. The technology can be included within the meter at a later stage of the roll-out, once the communications has been proven. With this approach, work can proceed on communications immediately, without going through more detailed consultations defining meter functionality.

## 6 Specification

Care should be taken to avoid specifying functionality that is independent from the communication system. This allows a transparent/generic model to be formed (for both Han and Wan). For example in Question 7, provided that 2-way communication for both Han and Wan is specified with delivery times, then the details of content should not be specified. The communication infrastructure put in place should be generic enough to support all the functions provided in a meter, and these will certainly evolve over time. Consideration should be given to paying for this centrally, and independently from the energy suppliers (for example initially direct government funded).

The baseline specification given in the supply license modification for non-prepayment customers is fairly straight-forward and should be used as a starting point, for both roll-out and consideration of contribution against benefit. It is a stake in the ground for today's situation, contractual relationships between parties, and the functionality that the energy suppliers and customers are working with, together with the basic requirements to deliver carbon savings and remove estimated bills/customer reads.

- real time information / interval data to the customer (which the customer should pay for)
- monthly or quarterly readings of maximum of 2/3 registers with meter serial number and time/date stamp to the supplier (which the supplier should pay for)

- A – Reads
- B – 2-way Wan
- C – 2-way Han
- D – Tariffs
- E – Load Management
- F – Remote disconnect
- G – Export
- H – External registers (e.g. micro-generator)

Most digital meters already provide functions A, D, E and G, and an add-on product such as the MeterPod™ can then provide B, C and H.

Functionality over and above the above baseline can be considered as separate exercises, weighing in the costs and benefits to the various parties. Bundling them all into a single specification, even if it were possible to agree what that was, will be fraught with problems.

Note: see Appendix ii) for current installed base of FLAG meters 22% nationally, and some as high as 50%. Many of these meters still have years of asset life left in them. Note that the only function a MeterPod™ add-on cannot provide is F – remote disconnect, and this is the most contentious function !

## **7. Interoperability**

We disagree with ESTA that industrial / commercial advanced metering is running satisfactorily. In the 100kW market interoperability has only been achieved by 3<sup>rd</sup>-party multi-vendor “head-end” software. Implementation of the many protocols has been at the behest of these vendors, effectively preventing new meters to be included independently. This restricts functionality to what the “head-end” software provides. Consequently there have been very few new meter types introduced since 1994 in the 100kW market, with no opportunity for innovation. It is also widely known that the database of technical details of the meters (e.g. channel numbers, pulse factors, etc, on which the head-end systems depend) has diverged from the actual details. This means that site visits are necessary to avoid erroneous readings.

In sub 100kW various vendors have offered complete solutions, including meters and software. These use GPRS or SMS technology but are very dependent on the integrated system, and do not allow for a new supplier / provider to take on the meter without first having a contract with the vendor. Generally if a new supplier is appointed the advanced meter is ripped out and a new one (that the new supplier supports) is put in its replacement. The customer is not generally aware that he is required to meet this cost again. This is an unacceptable position for roll-out to large scale (2M SME customers).

We are working with Elexon on a 2<sup>nd</sup> generation retrieval software specification. This allows meter vendors to launch new products together with a “driver” CD installed at the “head-end”. This ensures that the communications system and software will remain future-proof, as new meters and functionality arrives. Generic software with well-specified interfaces, such as CHIRPS (which has now been running virtually unchanged for 20 years) will ensure that the communication and head-end software remains stable. This will allow difficult decisions about meter functionality (for example remote disconnect) to be delayed until absolutely necessary.

We have been a major influence on the ESTA development of the AMR Service Provider Code of Practise for Gas, and believe this should be extended to include add-ons for electricity too. This is a great example of an independent approach being embraced by the Big 6 and is to be encouraged. There are a number of further initiatives. For example the CustARD

specification for electronic meter reads from customer to supplier has been launched in conjunction with ESTA members, SPAA and GS1, the global independent standards company. Based on an XML version of the existing data flows, this standard will allow customers to submit meter readings to their suppliers using AMR equipment they install themselves, or via a very simple user interface on their PC.

Add-ons such as the MeterPod™ should not be excluded from customer initiatives (e.g. CRC). In fact we believe if there are domestic initiatives in place, the customer will be more willing to take greater ownership of the metering, and is likely to get better value.

We agree with the BSi response that specifications in the roll-out should comply with national and international standards. Not only because this is an EU mandate to ensure interoperability, but also because it is common sense to follow the example of work that has been done by others beforehand and in other member states. Historically energy supply companies have had the privilege of setting their own standards. However they are now completely commercial companies, not public services, and we see no reason why any function should be subject to an exclusive specification within the industry. All this will do is enforce the “scarcity power” the Big 6 have over the whole economics of metering, resulting in higher cost, lower performance and the customer losing out.

## **8 Smart Grid**

The functions required for the smart grid will include remote switching of loads and monitoring of more detailed electrical values more instantaneously. We are not certain what all these functions will be yet.

Unpacking the generic communications model a little more, the main difference between smart metering and smart grid is access to fairly instantaneous data in both directions (instantaneous means probably within a minute). The specification need not go further than that. However this will have implications on bandwidth, and a decision will need to be taken as to the details of the communication to support this or not. But lets not complicate the issue, so we can get a better handle on what the cost increase is to have instantaneous communications, against batched daily.

## **9. Customer Interface**

Much research on customer feedback mechanisms has already been done in Europe both in ESMA (the European Smart Metering Alliance, of which we are members) and in Vaasa ETT, the Finnish based global energy think-tank. We are working with SenterNovem (an agency of the Dutch Ministry of Economic Affairs) on a common interface to the various display types already available. This is based on a fairly simple specification of an XML stream to the display, nominated over several of the more popular Han media (IP, Zigbee, ZWave, etc) together with a frequency request.

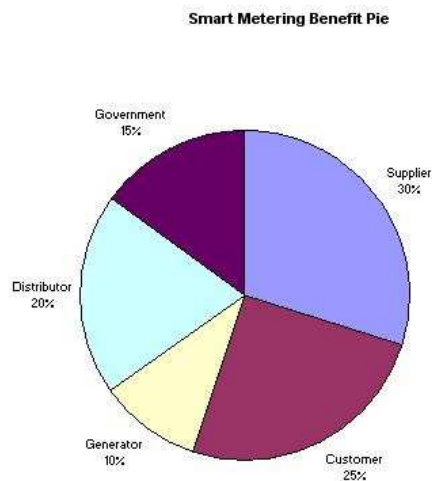
How the data is displayed to the customer should be left to the commercial decisions of the display unit manufacturers. They have also done a lot of research on this already. With a defined interface, the market would then be open not only to displays similar to the domestic trials, but to methods such as info to Internet, TV, mobile phones, PDAs, fridge magnet displays, use in central-heating controllers, dongle/software only solutions, etc. There are too many possibilities to be specified in a roll-out, and each customer will want different information and respond in a different way. The more choice he has the more engaged he will become. We are certain that this is an area the customer will be prepared to pay for.

There are already many parties out there selling and researching different methods of communicating energy consumption to the customer, including the likes of Microsoft. A model which relies on deciding a display method too early will lose value quickly.

On Q15 the essential difference is if the business is of a “household” type, i.e. when there is usually one person who can see consumption and can do something about it. A chip-shop with say a manager and a couple of staff would fit into this category, and would be OK on the domestic model. However a law firm, which may have similar consumption, but say over a dozen staff would need to be treated more like a business, because there would be more and different people reviewing and controlling energy use.

## 10 Benefit Pie

The benefit pie for smart metering is something we have proposed to DECC but have had some difficulty in having it considered further. This is likely to be because it does identify specific government benefits (largely international obligations) for which we believe they should contribute.



Assuming a communications infrastructure can be put in place that meets all the requirements of all the main parties, then how are the benefits roughly apportioned. This gives a reasonable indication of how the communications

costs should be met. The chart above is just an example – DECC will have a better idea of these figures.

The advantage of including government as a direct contributor/beneficiary means the customer would get better value than if done by a supplier-controlled “tax”. However it is done, it will certainly be seen as a “tax” by the consumer. You won’t get away with hiding it in the electricity or gas bill. Including government makes them more accountable for the delivery, and therefore a more credible tax for the customer.

The benefit pie also helps to unpack how costs should be apportioned between the parties on the areas that need to be rolled out centrally. It is clear that the customer will pay for the service eventually, but we believe that clarifying the stages of implementation against benefits received will maximize the customer value from a monopoly service provision.

## **11 Asset Life**

The stranded asset issue is covered in the consultation, and details of why compensation is unlikely to be awarded. However no mention is made of how this cost could be avoided. It is a responsible approach, particularly in a recession, to try to minimize this. The customers have already paid for it. Surely they have a right to continue using it to the end of its life. Dumping assets early is a costly intervention in itself. The incremental approach of using add-ons with existing metering that still have significant asset life, is the easiest way to minimize this

## **12 Conclusions**

We welcome the mandated roll-out smart metering, and agree with ESTA that the proposals are far too biased towards the energy supplier. We recommend the following

1. a thin Central Communications model, run independently from the energy suppliers
2. the embracing of independent add-ons (e.g. MeterPod™, Comet™), giving the customer greater choice, and driving the energy supplier-led solution costs down
3. encourage suppliers to embrace add-ons (e.g. FlowSeal) to assist in the gradual and controlled integration of proven communications technology
4. making use of the full asset life of all the meters
5. the adoption of new-generation “head-end” software to ensure new meters and functionality may be added in the future without major revisions (software driver CD principle)

6. definition of a simple Han interface using similar transparent communication principles to the above (XML type data streams)
7. a clear and accountable financial contribution from government in recognition of the benefits it will receive

## Appendix i) Meterpod™ and FlowSeal

### An Independent Solution

The suppliers will continue to be challenged while there remains an independent solution. The Pilot Systems MeterPod™ is such a device.



- 1) it uses the existing approved fiscal meter and does not require any change in arrangement with the supplier, data collector or meter operator
- 2) it sends HH data nightly to a collection point of the customers choice
- 3) it sends demand data to a local real time display
- 4) it sends register data (as customer reads) to the supplier in the format of their choice either monthly or quarterly on the date they specify, so that the customer receives a timely and accurate bill with a 'C' reading
- 5) it does not require any change to settlements

### Benefits to Customer and Supplier

Pilot offer the MeterPod™ solution, but we're certain there are or will be others. The important thing is it can be installed independently and it solves all the problems, benefiting both supplier and customer - DECC reckon this is about 30% supplier, 70% customer. The supplier certainly benefits from 4) above. That's the baseline.

## **Additional Supplier Requirements (FlowSeal) (Controlled by the Supplier)**



**FlowSeal – the MeterPod™ is added as a replacement terminal cover to the meter. This can be hot-wired to the existing meter in a fraction of the time taken to replace it**

Now the supplier will want to talk about security of installation and integrity of data, and the additional provisions below can be accommodated at an additional cost

option 6) - 4) can be provided via an approved data collector to produce the D0010 flow

option 7) - 1) can be provided by fitting the device in a replacement terminal cover, requiring meter operator privilege

Clearly the supplier should meet that additional cost, if he wants the additional integrity/security of option 6/7. He's been happy with up to two year's estimated readings, or customer own readings up till now. The market has allowed him to do this since 1998. So he's looking to improve service with these options, for which he should pay.

So what we're saying is supply contracts should initially remain the same, and as an addition this "independent" advanced metering model implemented - whether it's the device, or whether suppliers can be forced to make their pricing sufficiently transparent – that's why they need an independent offering there to challenge them.

## Appendix ii) FLAG Meter Coverage, as at Spring 2008

			<b>Total</b>	<b>HH</b>	<b>Token</b>	<b>Key</b>	<b>Smart</b>	<b>NHH</b>	<b>FLAG</b>
10	Eastern	A	3511249	12447	9385	87769	0	3401648	40.10%
11	East Midlands	B	2609569	12108	72268	187360	151	2337682	47.07%
12	London	C	2275867	13270	13	360610	0	1901974	22.38%
13	Manweb	D	1476749	4648	102838	166589	18	1202656	5.92%
14	Midlands	E	2429934	10284	52768	91192	181400	2094253	14.89%
15	Northern	F	1594021	5256	26	200818	37	1387884	28.54%
16	Norweb	G	2416615	8870	5922	62850	207852	2131121	11.34%
20	Southern	H	2980144	10990	20	281976	1	2687157	35.74%
19	South Eastern	J	2189395	6377	6	218161	1	1964850	1.65%
21	South Wales	K	1082679	3422	114495	43251	22	921489	16.91%
22	South West	L	1536762	4595	11	215089	1	1317066	29.11%
23	Yorkshire	M	2266591	9129	131498	118819	24	2007121	0.04%
18	South Scotland	N	2113629	6090	145030	207862	3	1754644	0.04%
17	North Scotland	P	848630	3385	90595	77545	1	677104	38.61%
<b>TOTALS</b>			<b>29331836</b>	<b>110871</b>	<b>724877</b>	<b>2319891</b>	<b>389511</b>	<b>25786649</b>	<b>22.13%</b>

Note FLAG meters were extrapolated using meter serial numbers from ECOS. Radio Telemeters are ideal for add-on communications because they already include load-shedding capabilities. These are installed extensively in East Midlands / Eastern and Scottish Power areas. Note the FLAG figure for Scottish Power is much higher than in the table. We believe this is due to Scottish Power redefining meter serial numbers.