Response to DECC Call for Evidence on Data Access and Privacy

eMeter welcomes the opportunity to respond to DECC Call for Evidence on Data Access and Privacy.

eMeter is a smart meter software company that provides a smart network application platform (SNAP) to integrate smart meters and smart grid communications networks and devices with utility IT systems. Being vendor-neutral toward all meter, hardware, and legacy utility software systems (e.g. CIS and Billing), eMeter has a unique, unbiased and global perspective on smart meter IT issues. In addition, eMeter's principals have participated in the definition and development of the smart grid for nearly three decades, including leading advanced metering working groups in regulatory proceedings, participating in a wide variety of industry standards groups, founding the Demand Response and Smart Grid Coalition (DRSG, managing consumer- oriented Smart Grid pilots (e.g. PowerCentsDC and the Ontario Smart Price Pilot) that have been recognized for demonstrating best practices, and testifying before the U.S. Congress and various state legislatures on these issues. eMeter has also been active in Europe, participating in EU and ERGEG activities and consultations, founding the Smart Energy Demand Coalition (SEDC) and having been an active participant in DECC and Ofgem's previous and current smart metering consultations, including those regarding DCC scope and functionalities. Finally, eMeter's software is in use in Smart Grid projects around the world, including several in Europe and successful multi-tenancy implementations of clearing house similar to the DCC, such as the IESO's centralized meter data management and exchange platform in Ontario, Canada.

This call for evidence looks for information on data access and privacy for consumers and not the implementation of security requirements for the smart meter systems. We understand suppliers are developing a Consumers Privacy Charter, which will contain and define what data is being collected, how it will be treated and what consumers' rights are. We are looking forward to participating in that consultation as well.

eMeter response here consists of general comments and the answers to those questions that are relevant to our expertise.

GENERAL COMMENTS:

1. Data Consistency between Meter and Retailer's Billing System. Based on our extensive experience, it is virtually certain that the data stored in the meter will differ from the data that retailers will use for billing. The latter will have had validation, estimation and editing performed as necessary for billing. While only a small percentage of smart meter data is typically changed – averaging around 2 percent of the intervals – the differences occur nevertheless. This retailer smart metering functionality verifies the

accuracy of interval data and makes corrections. Therefore, it ensures retailers have the most current and accurate data to drive billing or customer service, which will differ slightly from the data stored in the meters.

This problem of inconsistent data can be resolved by designating a single system as the official system of record and adopting business rules to specify the course of action when the two data streams differ. Our experience, based on approximately 40 major system implementations in North America, Europe, and Asia-Pacific, is that the best practice is to designate the meter database held by the meter data collector or management agent – depending on the market – as the official system of record. Data sent directly from the meter to an in-home display is generally designated as estimated, and customers are notified that billing quantities may differ. Such notification is even more important for amounts expressed in pounds and cents; clearly, for such data, the retailer's billing system is the proper system of record.

In our implementation at Westar Energy in Kansas, we also address this issue with respect to interval data presented online. This data is updated daily, based on meter readings from the previous day, and include a daily estimated cost calculation. At the end of each month, when bills are issued, the daily cost estimates are adjusted to match the final bill amount in a reconciliation process between the billing system and web presentment application. Such a reconciliation between half-hourly data stored in meters and data stored in the retailer's billing system would be quite difficult and complex, but may be needed to maintain consumer confidence in the accuracy of the data. eMeter would be pleased to discuss these issues with DECC and other industry participants if desired.

2. Regulated activities/Frequency/Changing them over time (

3. Experience of Other Jurisdictions. In July, the California PUC voted unanimously to adopt the world's first comprehensive set of rules to ensure that consumers can access the detailed energy usage data gathered by their smart meter — while also protecting the privacy and security of their data[1]. This decision applies to the three large investor-owned utilities which serve 80% of Californians with electricity (Pacific Gas & Electric, San Diego Gas & Electric and Southern California Edison). At last count, these three utilities had installed 8 million smart meters. By the end of 2012 they will deploy the final 3 million.

Here's what this decision calls for:

[1] - Decision 11-07-056, available at: http://docs.cpuc.ca.gov/published/FINAL_DECISION/140369.htm

- Web presentment. Utilities must provide via their websites the following information, updated daily: detailed energy usage, bill-to-date, month-end bill forecast, and projected month-end energy price. (Californians pay higher prices as they use more energy, progressing through up to five pricing "tiers").
- Tier alerts. When customers move from one price tier to the next, the utilities are to provide notifications "via e-mail, text message, tweet, chat, or some other form of rapid communication." PG&E already does this for its smart meter customers.
- Rate option calculator. Though few customers are aware of it, all residents and businesses served by California's three largest utilities have the option of switching to a time-of-use rate. The newly required calculator, which will appear on these utilities' websites, will help consumers understand whether they would save money by switching to a time-of-use rate. This tool would use an individual customer's data automatically from the utility.
- Real-time data. The smart meters installed by these three utilities all contain a radio that uses the ZigBee standard for transmitting data to homes and businesses. This is called the Home Area Network interface. So far this interface has not been turned on. Today's CPUC decision requires these utilities to file plans that "include an initial phase with a rollout that enables a minimum of 5,000 HAN-enabled devices to be directly connected with smart meters, as envisioned in the decisions approving the deployment of [Advanced Metering Infrastructure] — even if full functionality and rollout to all customers awaits resolution of technology and standard issues."
- Third-party data services. Consumers will be able to authorize third parties to receive their backhauled smart meter data data directly from the utility (as opposed to data that comes directly from the meter), to support services such as energy efficiency, demand response, energy advice, and more. The three major utilities will submit to the CPUC applications with specific plans, including which standards they will use — probably the Open Automated Data Exchange (OpenADE) standard in final development by NIST's Smart Grid Interoperability Panel and the North American Energy Standards Board. Importantly, the CPUC found: "The utilities, however, will bear no new liability for the actions of third parties which acquire information via this [mechanism]."

These interfaces and access channels are illustrated below. "OpenADR" refers to the open automated demand response standard for sending demand response price and control signals. In the UK, the

same overall architecture applies, though a portion of the "Utility Data Center" and the smart meter communications is handled by the DCC, and the HAN interface is external to the electric meter.

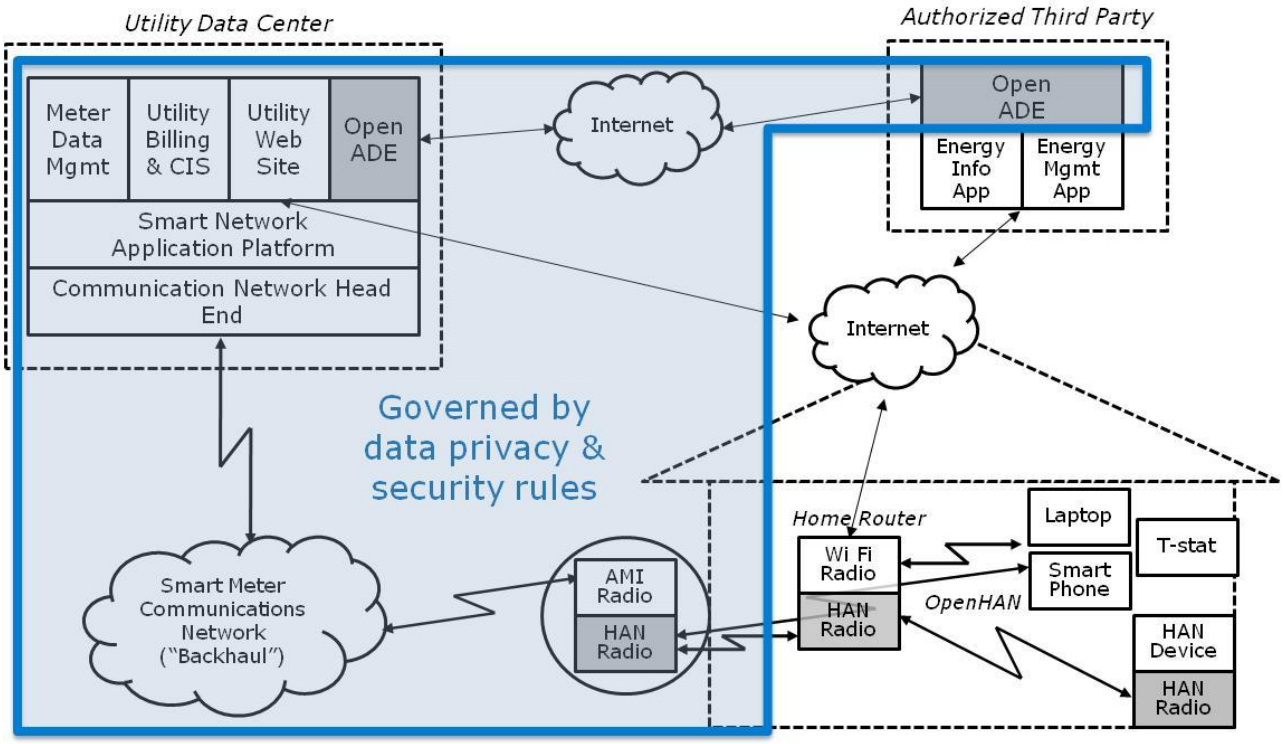

Figure 1: Data access, privacy, and security per California Public Utilities Commission decision in July 2011.

Furthermore, to protect consumer privacy and data security, the CPUC is exercising jurisdiction over third parties who receive data (via the backhaul mechanism) in the course of providing services to utilities, or when authorized by consumers. However, the CPUC is not exercising jurisdiction over third parties who receive energy usage data directly from a device installed at residence or business that receives data via the HAN interface.

In this decision the CPUC relied mainly on existing privacy law, using the Fair Information Practice Principles which the U.S. Department of Homeland Security developed as its privacy framework. To clarify the application of these principles, the CPUC decision includes an appendix with details of its privacy rules. Here are the FIP principles, all of which are utilized by the CPUC:

- Transparency
- Individual participation

- Purpose specification
- Data minimization
- Use limitation
- Data quality and integrity
- Security
- Accountability and auditing

The CPUC decision — which runs to 168 pages without the five appendices — contains more details. CPUC Commissioner Mark J. Ferron said he hopes that "this decision will result in a more service-oriented and customer-friendly industry."

eMeter is not suggesting that DECC adopt everything included in the CPUC decision, only to consider the decision, arguments, and practices therein.

4. eMeter's comments on Working Group Privacy (working on it…)

5. Energy Information Feedback: In-home displays are not the only answer to the question of how to motivate consumers to conserve energy through feedback. In-home displays are useful tools for some consumers, but not all, and have insufficient information in many cases. For example, the consumer focuses on reducing electric heat by knowing it contributes 50% of the bill amount, not knowing it has real-time power consumption of 1.5 kilowatts, as do a hair dryer or toaster. We suggest the answer, instead, is to provide the right information in the right way to widely varying individual consumers. This includes recognizing that "right" differs for consumers: some like in-home displays, others prefer the data on their laptop where it can be more easily manipulated and understood, others on their smart phones, and others a printed report with their bill. A statistically valid survey of residents and businesses throughout California expressed the following preferences for receiving information:[2]

[2] - Opinion Dynamics Corporation, *Final Report, Information Display Pilot, California Statewide Pricing Pilot*, January 5, 2005.

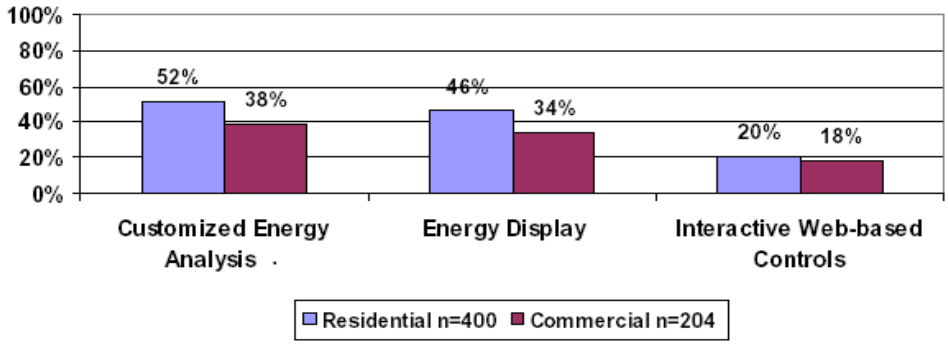

Figure 2: Residential and consumer interest in energy information; California survey results.

Additional information on this issue is provided below.

ANSWERS TO SPECIFIC QUESTIONS

Question 1. Please submit any further evidence, such as surveys or consumer research, regarding privacy issues and smart metering. In particular is there evidence available about the effects of the availability and aggregation levels of more granular data (for example daily)?

Privacy is at once a major concern and a problem largely solved. It is a concern, because regular and sudden dips in energy usage could indicate the consumer is away from home, and the length of the dip could also indicate the duration. As the information collected may be available in a number of ways, including access from mobile devices, this information could theoretically put the consumer premises at risk.

However, sensitive data handled carefully has managed and limited any such risk. Far more sensitive data is available with regard to phone call records, banking data, credit card information, and even stock trades made online. In such cases, telecommunications and banking firms have taken extensive steps to protect privacy, with high – though certainly not perfect – levels of success. Privacy should be protected via limited access, password security, multiple levels of security, and encryption of data sent from smart meters through both local and wide area networks. The California PUC has adopted the U.S. Fair Information Practices principles that provide a high level of privacy and data security; DECC should review the PUC decision for applicability to GB.

Regarding availability, consumers respond via better understanding and energy saving measures to data ranging from monthly data for billing to next-day online data to real-time data. More specific details on each of these is included in the California data access and privacy decision discussed above.

VaasaETT conducted a study of approximately 100 pilot programs, finding reduced energy consumption of up to 19% for information provided to consumers:[3]

> *The aim of the research whose results are presented in this report has been to discover the potential and limitations of a range of feedback and dynamic pricing programs enabled through smart metering technologies. VaasaETT's findings and conclusions based on a large pool of pilots are designed to gauge repeated results and surrounding requirements for success. The research involved collecting and comparing about 100 pilots. Typically, organisers divide participants in a pilot into sub-groups in order to test different solutions, for instance different feedback types, different dynamic pricing schemes, a group with home automation and one without, etc. Hence, the pilots were broken down into 460 samples. The samples were then analysed according to 22 different variables selected to gauge internal structural pilot variables influencing success as well as outside market factors which might also impact a pilot outcome. In total, over 450,000 residential consumers were involved in the reviewed pilots. Feedback pilots are designed to help participants reduce their overall energy consumption, lowering distribution and supply costs. In comparison with the other feedback channels, IHD resulted in the highest energy savings. The remaining channels for feedback, webpage, and informative bills produced almost equal consumption reduction levels. Quite possibly, the key advantage the IHD offers over the remaining channels for feedback is the almost real-time and visible aspects of the delivery of feedback. TOU peak reductions are the lowest, but they occur daily, while CPP and CPR produce the highest reductions but only for critical peak periods. The main findings demonstrate that consumers do react to feedback and dynamic pricing mechanisms positively, pilot results maintain over 2-3 years and they can also be effective in consumer groups of over 1,000 households. In addition, post pilot surveys show that on average 75 – 90% of participants were satisfied with the pilot with in which they took part. That said, results vary widely within a given program type; an IHD pilot can attain 3% or 19% reductions. Therefore the research findings also confirmed the assumption that surrounding variables have a substantial impact on program success levels over and above the supportive technology used or program structure.*

Question 2. To what extent would different rules for access to data between suppliers and third parties

[3] - VaasaETT, *Empower Demand: The potential of smart meter enabled programs to increase energy and systems efficiency: a mass pilot comparison,* October 2011, available at: http://www.esmig.eu/press/filestor/empower-demand-report

be expected to impact on the development of an energy services market (in terms of product and tariff innovation and / or entry to the energy market by third parties)? What are the particular data uses to which these concerns apply?

Half hourly metering data would support benefits to suppliers such as bill accuracy, demand forecasting, product innovation, energy management products, reduced energy bills, better system planning, and demand response. Half hourly data should be also made available to third parties, regulated or consumers approved, as it not only will enhance competition, but also it will bring consumers choices of services and services providers.

Specifically, if retailers have access to half-hourly data, they can offer the full variety of tariff options, a key source of benefits of smart meters. Such programs can account for $2 billion in savings for a utility with less than 1.5 million meters.[4] However, as with the other benefits of Smart Grid, such savings are possible only if the software application functionality properly supports implementation of the pricing plans. In another example, dynamic pricing benefits in the European Union have been estimated at EUR 53 billion.[5] See the chapter by Faruqui for additional elucidation of dynamic pricing benefits.

Dynamic pricing rates include several options. Time-of-use (TOU) rate schedules assign different pre-determined rates to pre-defined time periods and customers pay those pre-determined rates during each time period. For example, during the summer, the rate charged during the afternoon is generally higher than the rate charged at night. The different rates reflect the fact that it is generally more expensive to serve customers during some time periods. TOU rates do not change based on current market conditions. Different TOU rates are set for the summer and the winter seasons.

Critical Peak Pricing (CPP) generally describes rates where a very high rate will apply to a customer's usage during CPP events, typically 60 hours per year. In return, the customer gets a small discount during the remaining hours of the year. The CPP event is triggered based on system conditions, such as high temperature. CPP events are for specific hours and are called on a day-ahead basis, and must be tracked in the IT system to enable billing. There are a limited number of CPP events a year. Another name for CPP is Peak Day Pricing (PDP)

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[4] - Baltimore Gas & Electric Company, *Application of Baltimore Gas and Electric Company for Authorization to Deploy a Smart Grid Initiative and to Establish a Tracker Mechanism for the Recovery of Costs,* July 13, 2009.

[5] - Ahmad Faruqui, Dan Harris, and Ryan Hledik, *Unlocking the EUR 53 billion savings from smart meters in the EU: How increasing the adoption of dynamic tariffs could make or break the EU's smart grid investment,* Energy Policy, October 2010.

Real Time Pricing (RTP) rates are based on prices in the wholesale energy market, e.g., the PJM day ahead market. RTP rates apply to every hour of every day, and are subject to changefrom hour to hour. RTP rates are usually communicated to customers a day ahead. Such rates are also called "Hourly Pricing." Hourly prices were tested with residential consumers in Washington DC, where 93% of the program participants preferred such prices to their previous rates.[6] In Illinois, all residential consumers have the option of signing up for such pricing, although an extra monthly metering fee of $2.25 is likely limiting participation.[7]

Peak Time Rebate (PTR) is a program that provides the customer a rebate on a per kWh basis for reductions in the customer's usage below a threshold level on days when a PTR event is called. The baseline is specific to each customer and is based on the customer's prior usage for specific days prior to the day of the PTR event. The PTR event is like a CPP event, is called based on system conditions, and is called on a day-ahead basis. The number of events per year is either specified or can be within a range, usually up to 15 days, four hours per event. PTR programs have proved popular with both regulators and consumers, and utilities in California and Maryland are planning to offer them to all small business and residential consumers.[8] In the Washington DC pilot program, PTR prices were offered to low income consumers as well, with 91% of them saving money on the program.[9]

Regarding low income consumers, the Edison Foundation Institute for Electric Efficiency found:[10]

> *While there is mixed evidence on the magnitude of the responsiveness of low income customers relative to other customers, there is strong evidence across these five programs that low income customers do respond to dynamic rates and, in many cases, that response is a load reduction above 10%. Furthermore, even without responding to dynamic rates, a large percentage of low income customers will be immediate beneficiaries of dynamic rates due to their flatter than average load profiles. These results suggest that when evaluating dynamic pricing, it is important*

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[6] - eMeter Strategic Consulting, *PowerCentsDC Program Final Report*, September 2009, available at: www.powercentsdc.org.

[7] - CNTenergy and Navigant Consulting, *Residential Real-Time Pricing Program Achieves Savings for Utility and Customers,* Presented at Annual Conference of Association for Energy Services Professionals, Phoenix, Arizona, February 2010.

[8] - Chris King, *Smart Meters: Tariff Design Options and Case Studies*, Presentation at National Association of Regulatory Utility Commissioners Annual Conference, Atlanta, Georgia, November 2010.

[9] - *Op. cit.*

[10] - Institute for Electric Efficiency, *The Impact of Dynamic Pricing on Low Income Customers,* White Paper, September 2011.

to recognize that such rates are not harmful, and, in fact, may be beneficial to a large percentage of low income customers.

Beyond basic smart meter capabilities (such as remote reading, memory switching, prepayment diagnosis, and interoperability), other features are needed to support smart grids. These include:

- Measuring interval data at least as often as market operator settlements occur (typically half-hourly or hourly).
- Tracking how wholesale electricity prices change in response to demand.
- Tracking the amount of electricity supply available to meet demand.

Question 3. Are there any data uses, apart from those set out below, where the arrangements for access to data could have an impact on the benefits of the programme. How does this analysis differ for the gas market?

eMeter recognizes more than the first six uses of data that DECC lists in the call. Therefore, the arrangement for access to data will have an impact.

1. Energy Efficiency, through consumer information feedback
2. Theft
3. Time of Use Tariffs
4. Settlement
5. Wholesale Hedging
6. Debt Management
7. Peak Reduction through dynamic pricing and automated control.
8. Demand Response
9. Balancing Supply /Demand and greater support of intermittent renewable
10. Voltage Control and Better Management and Planning of Consumers Generations sites.
11. Increase utility operating efficiency through automation of manual functions
12. Support for Electric Vehicles through dynamic pricing and automated sensing and controls
13. Distribution Automation.

We would like point out that to engage consumers with smart meters uses, they should not wait for smart meter benefits. UK consumers should start enjoying benefits from their smart meters no more than a few days after installation. These benefits include:

- Details about their energy consumption, along with the context of price and even their greenhouse gas footprint.
- Next-day online access to their energy information.
- Optional access to real-time data through a Home Area Network interface.

To avoid delaying consumer benefits, UK suppliers must have their IT and communication systems ready by the time smart meters are installed. What is more important, is that consumers should have next-day web access to their consumption. And they should be able to view their energy consumption together with the price, and, if possible, with the carbon dioxide footprint that their consumption produces.

We believe that counting only on the in-home display mandatory would actually end up putting consumers at a disadvantage, since this fast-moving market continually delivers new and better solutions. For example, there are already web portals and smartphone applications that help consumers plan and monitor their energy use, or set alarms for specific consumption thresholds or budget targets.

Question 4. What types of energy services and energy advice could be provided by the market (by suppliers and / or ESCOs / potential new entrants) that require access to specific levels of data?
What level of data granularity (frequency, time-lag) are needed to provide such services and what is the potential impact of these services in terms of percentage energy savings?
Please provide empirical examples and explain the basis of any assumptions and distinguish between gas and electricity.

Services	Participant	Frequency	Time Lag	Impacts
Demand Response	Supplier, ESCOs	HH		Optimization of the distribution and transmission grid capacity
Power Quality	DNOs			Last Gap control
Dynamic Pricing	Peak/Off Peak	Peak/Off Peak		Demand Reduction / Rebates
Net Metering	PV Developer/ Consumer			Accuracy

EV charging	ESCO, Suppliers	Peak/Off Peak		Identify time of charge
Voltage Control	DNOs, ESCOs			Better grid planning

Demand-side programs could help balance the network — but to do so, there should be a link between network operators and their customers' base. For instance, where smart meters are deployed, network operators could get involved in demand side efforts such as electric vehicles, heat pumps, and distributed generation.

Consumers should be able to sign up for automated demand response programs and control systems. This will allow them to receive price signals or price information, to which they can respond by modifying their energy use. Thus, simple demand becomes smart energy demand.

Examples of how consumers can respond to dynamic prices:

- Cut peak demand
- Shift usage to off-peak hours.
- Reduce total energy consumption.
- Actively manage electric vehicle charging.
- Actively manage energy usage to respond to the availability of solar, wind, and other renewable resources. For example, programming a dishwasher to run only when wind resources exceed a certain threshold previously established. A smart dishwasher could communicate with the grid operator to get this information via the HAN gateway or the internet.
- Purchase more efficient appliances and equipment, based on a better understanding of how each device uses energy.

These actions maximize savings to consumers and other energy users. And in the bigger picture, aggregators will use information from smart meters and home interfaces to help keep the overall power grid balanced and efficient.

Question 5. Should theft management be considered a regulated duty for which suppliers should have access to a certain level of smart metering data? What level of data would be required and how would this be used to manage theft? Please provide practical examples.

Energy theft harms all honest energy consumers and should be a priority for DECC. Theft in advanced industrial countries such as GB is estimated by various industry sources at around one percent,

equivalent to about 300 million GBP per year for all of GB at that level. If retailers are provided with sufficient information from smart meters, they can identify or prevent many cases of energy theft. Smart meters enable detection of energy theft using the following methods:

- Flags for "momentary" outages, typically delivered along with daily meter reads. Such flags may indicate a meter disconnected to install a bypass, particularly when no other meters in the area experience the outage. Because this requires comparison of data in a localized area with customers served by multiple retailers, it may be better suited for DNOs to perform such detection. In addition, DNOs will be processing other outage alert data, so adding momentaries to their remit is a logical extension.
- Unusual usage patterns indicated by half-hourly data, revealed via data mining of billing data, half-hourly usage, weather, time of day, and other factors. One example would be a sudden change in load magnitude or shape. Another would be load different from that of other, similar customers.
- Energy balance of metered data vs. aggregated data at the transformer or feeder level. Again, because this involves customers served by multiple suppliers, it may be more suited for DNOs. Moreover, DNOs are already financially incentivized to reduce distribution system losses, which include both technical and non-technical – theft – losses. This technique is most effective if the transformer or feeder has its own meter.

BC Hydro of British Columbia estimates present value savings of reduced electricity theft of $732 million CDN over the 20 year life of its two million smart meters.[11]

Question 6. Does data need to be collected from all customers all of the time, for theft management, or could there be a trigger for accessing more detailed data (for example where theft is suspected)?

As indicated above, various analytics offer the best means of detecting and managing theft. Accordingly, it is most effective to collect all data from all customers all of the time. In addition, having a standard data management protocol for all customers minimizes the business process management costs of having different levels of data collection for different cases and in a dynamic environment.

Question 7. What level of take-up of time-of-use tariffs could be expected under different scenarios for access to data? What information is needed to design time of use tariffs? In particular would sample or

[11] - BC Hydro, *Smart Metering & Infrastructure Program Business Case*, January 2011.

anonymised data be sufficient?

Based on experience designing time-of-use rates for several utilities, including Pacific Gas & Electric, eMeter Strategic Consulting can testify that sample, anonymized data is sufficient to design such rates.

In contrast, regarding take-up, the California utilities found that individualized bill comparison data – time-of-use vs. non-time-of-use – was highly effective in educating consumers about time-of-use rates and about making an informed decision about such rates.[12]

For these reasons, the California Public Utilities Commission in July 2011 decided to require the California utilities to offer individual-specific time-of-use rate comparisons to all of their customers on the utility websites.[13]

Question 8. Do you agree that individual half-hourly data is not currently required for suppliers to meet their obligations in relation to settlement? Over what timescale are any changes to settlement likely to take place and what might the implications be in terms of data requirements?

In our response to ELEXON Consultation/ Impact Assessment on Mandatory Half-Hourly Settlement for Smart Meters, we agreed with Elexon that half hourly metering data would support these benefits to electricity retailers:

- Accuracy
- Demand forecasting
- Product innovation
- Energy management products
- Reduced energy bills
- Better system planning
- Demand response (smart energy demand)

If HH data is not used for settlement, consumer usage changes are not reflected in the bills they receive. This is because customer class average profiles are used instead, and an average profile does not change when an individual's usage changes. Thus, if HH data is not used for settlement, retailers see no wholesale cost savings and have nothing to pass on to the consumer.

[12] - Charles River Associates, *Impact Evaluation of the California Statewide Pricing Pilot,* March 2005.

[13] - *Op. Cit.*

To get this cascade of benefits flowing — and avoid consumer backlash to smart meters seen in some places — consumers must see benefits from smart meters immediately after installation.

If Great Britain were to implement HH settlement according to the early scenario mentioned in Elexon's consultation (by 2014), that would enhance the chances for smart meter success, since consumers would realize benefits faster.

In Northern California there was a gap between when Pacific Gas & Electric installed smart meters and when customers started seeing benefits such as access to detailed energy information, pricing options, and automated control of thermostats and appliances. This delay contributed to a much-publicized smart meter backlash in that region.

Non-half hour Settlement	HH Settlement
Spot Meter Read Annualized Advances (AAs) Estimated Annual Consumption (EACs) Profiling Multiple Registered – Economy 7 Representation of the average consumption shape, not individual consumption shapes.	Accuracy Demand Forecasting Product Innovation Energy Management Products Customer Invoicing and accurate Bills Reduced Energy Bills Reduced Agency Cost Settlement Cast Flow Reduce Dist. Use of System Charges Better System Planning Demand Side Response PLUS Benefits according to eMeter

How and how often consumers receive the accurate and latest information will affect their capability to be more or less active toward more dynamic and often readings. Standalone In Home Display versus Web Applications where the consumers could interact with information with easy tools that set up filters of consumption alarms in case of prepayment.

Vital for the successful of the roll out of smart meters is that consumer should experience immediate benefits after the installation of the smart meters, such as detailed information about their energy usage with their monthly bill, next day only access to their energy information, and the option of real time through a Home Area Network (HAN) interface.

eMeter believes an early mandate of Half and Hour reading rather than the later ones will enhance opportunities of a successful smart metering system roll out. Therefore we see benefits coming from the mandating Half and Hour reading when the DCC goes live, in 2012. Here we would like to comment on the Swedish Case, where households are already equipped with smart meters can gather data hourly but to realize the full benefits of the smart metering system and demand response, together with managing micro-generation and private energy production, the meters must record and transmit data more frequently, at least daily. Since in Great Britain the meters are already mandated to collect HH data, the settlement should also benefit from more granular information.

Question 9. How far would aggregated or sample data provide suppliers' with what they need in the area of wholesale hedging? Please provide examples of how the data would be used and where possible quantify potential benefits and costs.

Better data increases accuracy and reduces risk – therefore lowering wholesale hedging costs. Retailers could aggregate HH data for their customers based on actual consumption rather than estimates and use the aggregated HH data to determine supply – and thus hedging – requirements.

Question 10. What level of data would be required and how would this be used to manage debt? Please provide practical examples.

Here again, we see the solution could sit on setting up some debt trigigers and analytics at the retailers' back office smart metering software. They will recognize consumers with debt behavior patterns, and could investigate further where they are vulnerable consumers.

Question 11. How would suppliers envisage using daily data to support debt management and what evidence do they have to support claims of additional savings that could be achieved with access to daily data as opposed to less frequent data?

It is slowly becoming standard in North America for utilities with smart meters to develop daily month-to-date bill estimates and deliver such to customers online or through smart phones. Texas retailers voluntarily – spurred by retail competition – provide a service where consumers can send a text message to their retailer and receive an immediate response of their bill to date, calculated using smart meter data collected daily. These Texas retailers also allow consumers to set monthly energy budgets or thresholds and receive emails or text alerts when their bills exceed the thresholds.

California is requiring it of its investor owned utilities.[14] This gives consumers – especially those with debt problems – the ability to manage their energy better, thus reducing debt management costs for retailers.

Question 12. How could smart metering data be used to identify and protect vulnerable consumers? Should such activity be considered a regulated duty and are any licence changes needed to create particular duties on suppliers in this area?

Smart metering data could be used as described in the response to Question 11 to identify and protect vulnerable consumers. Note that automated phone calls are another means for alerting customers (eMeter Strategic Consulting used automated phone alerts for notifying vulnerable customers of peak demand events in the PowerCentsDC Program[15]); some customers do not have Internet access or mobile phones.

Question 13. Do you consider that use of data by network companies to support them in maintaining an efficient and economic network should be considered a regulated duty?

Network operators companies will benefit from having access to the smart meter data. Vattenfall Finland, a network operator, estimates that its operational efficiency will improve 5% thanks to access to the meter data. This will be also visible to the consumers in the form of better power quality, i.e a reduced amount of down-time in the network and reduction of blackouts. This is a clear example on how enabling network operators having access to the meter data will not only bring operational benefits to them, but to maintain an efficient and economic network. Therefore we believe access to the meter data should be open to network operators.

Vattenfall Sweden presented this list of utility smart meter benefits at the IEEE Power, Energy, and Society conference on Innovative Smart Grid Technologies, Europe (Oct. 11-13, 2010, Gothenburg, Sweden):

- Automatic collection and compilation of outage statistics
- Power outage identification and proactive fault tracing
- Identifying remaining outages in the low-voltage grid
- Indicators for analyzing disturbances in the high-voltage grid

[14] - *Op. Cit.*

[15] - *Op. Cit.*

- Automatic analysis of load and voltage to spot sources of disturbances
- Better automation of power quality measurements
- Allowing the customer service center to make spontaneous meter readings
- Scheduled meter readings
- Automatic tariff changes
- Customer complaint handling
- Ground fault alarm
- Load analysis
- Network capacity planning using precise metered values for peak load
- Categorizing customers by load characteristics
- Locating electricity theft
- Analyzing network losses
- Internal analysis of reactive power demand
- Unified (and thus more efficient) handling of meter readings

Question 14. Do you agree with the requirement for such data to be anonymised or aggregated wherever possible, and how should this be monitored?

It is more important to protect the privacy and security of data than to anonymise or aggregate it. All companies with regulated access to smart metering data – i.e., data not provided by the consumer voluntarily and with informed authorization – should be required to report any unauthorized releases of data, and regulators – likely Ofgem – should have authority to investigate similar complaints by customers or those working on customers' behalf.

Question 15. Would suppliers be expected to advise consumers of network company usage of data given network companies do not have a direct relationship with customers?

No comment.

Question 16. Are there any alternatives to a basic opt-in or opt-out approach to consumer choice such as some form of prompted choice? What are the practical and consumer protection considerations in relation to different options(for example when and how)? From a consumer perspective what alternative approaches and vehicles (for example letter, email, phone) to seek customer consent are there?

For a smart balanced grid, the more consumers engaged in the smart metering roll out, the better. For that reason and taking into account the outcome of recently released research by E.On, nearly two-thirds (63%) of UK residents are confused about smart meters and what they do. Some respondents believe a smart meter is an electronic device that lets you make face-to-face calls with your energy retailer, or a gadget that lets you turn off electricity in part of your home. For that reason to introduce the opt-in by default seems more appropriate than to opt-out based on lack of understanding of smart metering and smart grid potential.

Question 17. What evidence is there of likely take-up rates that could be achieved through different approaches to consumer choice?

In the case of Puget Sound Energy, over 90% of residential and small customers voluntarily remained on an opt-out time-of-use rate – even after negative press stories. This involved over 300,000 customers. In California's Statewide Pilot Program, market research via statistically representative surveys estimated about 70% of customers would remain on an opt-out dynamic pricing program.[16]

Regarding opt-in, about 35% of residential customers at Arizona Public Service and Salt River Project in Arizona – a total of over 500,000 customers – have selected and remained on time-of-use prices.[17]

In the U.S. caller ID for telephony was implemented via opt-out. In most states, well over 90% of customers allowed their phone numbers to be revealed to call recipients. In California, the PUC implemented an aggressive campaign to educate consumers – with three letters from their phone company (this was in the 1980s). A large percentage of consumers – roughly half – felt the repeated mailings implied that the PUC believed consumers should opt out of caller ID and those consumers decided to opt out. Whether this was good or bad is a matter for debate. However, since that intensive campaign was concluded, the opt-out rate is well under 10%.

Question 18. What current and future technical options exist for energy consumption data minimisation / privacy enhancing technologies? How might aggregated or anonymised data be provided in practice? Would this imply additional services to be provided by DCC?

Aggregated and anonymised data are easy to provide if done by a centralized agency such as the DCC. The DCC could easily strip out customer identifiers and aggregate by any number of criteria. Other

[16] - *Op. Cit.*

[17] - *Op. Cit.*

parties would have difficulty performing aggregation, since only the DCC – by definition – has access to all of the data. Any party could easily strip out customer identifiers, but the identity of the party providing the data – for example a specific retailer – could reveal something about the data. In California, when retail competition was in place, the distribution utilities provided data aggregated by postal code for use by competitive retailers, including time-of-use data for customers who had such data. In practice, the data was not used in any significant way. (eMeter could provide samples if desired.)

Question 19. What parts of the privacy policy framework do you think should be delivered by regulation and why?

As noted above, the California data access and privacy decision provides a useful framework for consideration.

Question 20. What is the most effective way to set out any sector specific protections around privacy (e.g. licence conditions or other alternatives)?

As noted above, the California data access and privacy decision provides a useful framework for consideration.

Question 21. What practical options for authentication would provide the right balance between allowing easy access to consumer data in the home while providing the necessary privacy protection? Are there any other issues or options that the programme should be considering in developing the approach in this area?

eMeter would urge DECC to adopt authentication principles already widely and effectively used, such as on the Internet and by call center representatives. Smart meter data is not inherently different with respect to privacy and security and does not require new options; instead, we suggest effective application of existing options.

Question 22. Are there other issues that need to be considered to make using the HAN a viable route for access to data in the home, from either a process or consumer perspective?

The HAN is, in principle, the same as a home Wi-Fi network. The same security principles should apply.

Question 23. What sort of arrangements would provide an appropriate balance between providing ease

of access for consumers seeking to sign up to new services and adequate protection for consumers' data when accessed via DCC? Do you have any suggestions for alternative approaches?

eMeter would urge DECC to adopt authentication principles already widely and effectively used, such as on the Internet and by call center representatives. Smart meter data is not inherently different with respect to privacy and security and does not require new options; instead, we suggest effective application of existing options.

Question 24. Are there other issues or options that the programme should be thinking about for the Foundation Stage or for non-domestic customers to facilitate access to data?

As noted above, the California data access and privacy decision provides a useful framework for consideration.

Question 25. Do you have any suggestions as to how the Foundation Stage can be used to further learn about our approach to data access and privacy?

The same principles should be applied in the Foundation Stage as during the operational stage. Roles may differ, of course, because the DCC will not be in place. However, there is no reason policies should differ.