Glen Dimplex Submission – CER Smart Meter Consultation – Dec 2011

Summary of key Glen Dimplex points:

- **Smart meter infrastructure in Ireland is a key enabler in the delivery of smart appliances participating in automated DSM programmes i.e. not requiring user intervention for triggering. These programmes can deliver, in addition to improved energy efficiency, a massive reduction in CO2 emissions in domestic energy use; and facilitate wind penetration as per Ireland's 2020 renewable energy targets.**

- **Smart Meter Infrastructure in Ireland must:**
  - **Support the HAN and integration of smart appliances**
  - **Support TOU tariffs**
  - **Support DSM trials and roll out of appliances that participate in DSM programmes**
  - **Support the integration of onsite renewable generation such as PV, and the integration of these technologies into the grid.**

- **Glen Dimplex has complete end to end systems (from cloud based control through to smart water and space heating appliances, both traditional direct acting and renewable) at an advanced stage of development and trial**

1. Introduction

The Glen Dimplex group of companies produces heating products and household appliances. Products include heat pumps, PV systems, solar thermal systems, ventilation, MVHR systems, direct acting heating (installed and portable), storage heaters, hot water cylinders, cooking appliances, fridges/freezers. From an appliance perspective the smart meter infrastructure is critical to the development of products and systems that will deliver on energy efficiency and demand side management programmes.

Response to the consultation document

1. Glen Dimplex fully support the introduction of TOU tariffs and recognize the importance of these being designed into (both hardware and legislative) the whole smart meter infrastructure in Ireland from day one.
2. Glen Dimplex believe that a mix of products including renewables , fossil fuel based and electrical resistance heating will come to the fore in the medium to longer term. These systems will be networked within the home and there will be connectivity to the outside world through the smart meter infrastructure, and possibly by other communication routes.
3. DSM products and Systems: The consultation document remarks “important sources of variation in estimated NPVs arose from assumptions about the expected pattern of residential demand response”. Glen Dimplex believe that in the area of space & water heating in the domestic environment, there is great potential for automated demand side management products/systems – see note 1 at the end of this document. These products can deliver a large reduction in carbon emissions by shifting from fossil fuel based electrical generation and gas consumption to renewable energy (wind based in an Irish context); and done so in a way that is invisible to the home owner/occupant. These systems are being tested in labs and trials in Ireland, the UK and across Glen Dimplex group companies EU wide. The risk of Investment in these product offerings is high as the route to market is not clear (immaturity of standards a key issue). If during the design stage and early roll out, the Smart Meter programme supports the connection of appliances to the consumer HAN for the purpose of trial and test, this would support such investment and mitigate risk. In other words Glen Dimplex believes that to preclude the connection of appliances and product offerings to the consumer HAN at the SM implementation design stage (phase 2) and pre-deployment

phase, would be a major setback to appliance manufacturers looking to engage in the Smart products and DSM product market. The smart meter programme should look to support manufacturers in this regard i.e. allow the market for systems connected to the consumer HAN to mature and be proven, thereby fueling a hard business case for the investment in and maturing of the HAN communications layer itself. It is important that these systems are not precluded, on the basis of their immaturity from phase 2 of the smart meter programme. This would be a lost opportunity for the development of these technologies by Irish companies.

4. Consumer HAN: Two way communications is very important, GD broadly agree with the document's view that the benefits of two way comms far outstrip the incremental cost of a shift from one way to two way data transfer. Glen Dimplex supports the view that these comms technologies are not fully mature but mature solutions will emerge quickly once market pull (i.e. an application which solves a significant problem) is there. In this regard comms solutions should be modular from a SW and HW perspective. Production meters can be upgraded mid roll-out easily with low risk or worst case a field upgrade can be done at relatively low cost if necessary. Same modular approach should be adopted wrt development on the appliance side.

5. Consumer HAN: The meter data should be made available at a reasonable frequency to other appliances and control systems within the home, reasonable frequency of not less than 10 second intervals (in reality the IHD would need to be serviced more frequently, or at least at this rate. Waiting for any longer than 10 secs to see power register on the IHD would arguably impact consumer acceptance and confidence in the IHD). This allows the development of systems that can use this data and deliver services without stressing the HAN network or requiring technologies that are costly and difficult to implement and integrate (frequency of delivery of meter data over the backhaul network to the supplier i.e. over the WAN as opposed to the HAN is a separate issue)

6. Smart Meter WAN: As well as the smart meter WAN infrastructure, Glen Dimplex believe that the internet infrastructure will also be important to the development and roll out of system solutions being installed in homes. Security and data protection also of key importance.

7. Communications Hub: Whilst not disagreeing with the statement on page 52 (section 5.2) re the Hub, Glen Dimplex believe the Smart Meter Rollout shouldn't eliminate the provision (rather future proof for it) at some stage for the use of a separate communications hub. The scenario envisaged by Glen Dimplex is that the initial rollout may have a gas meter talking to an electricity meter (the hub) which conveys information to the IHD and other devices that have shown through trails to deliver on energy efficiency or carbon reduction. If in the future the information is received by an additional hub (provided by the market as it facilitates energy efficiency and carbon abatement) and then conveyed to other appliances/ systems within the home. The advantages of the hub are:
    a) The hub solves a future problem i.e. how to upgrade the Consumer HAN infrastructure/functionality without the need to change the basic smart meter
    b) If, at a future date, the smart meter can no longer service the HAN requirements this allows the smart meter infrastructure to be upgraded with an additional separate module without the need for an upgrade of the smart meter itself. Approval/ conformance of the hub to a particular standard would need to be tightly controlled.
    c) Its cost could be swallowed by the cost of the system installation that required the hub in the first place.
    d) It can be upgraded without upgrading the smart meter as technologies develop
    e) Hub can be a bridge between wireless/wired technologies and protocols, may also allow the provision of a firewall to facilitate security needs of the Smart meter network.

8. Provision for switching legacy loads: Consultation doc states "It is proposed that the electricity meter includes functionality for a single controllable physical circuit for legacy loads such as night storage heating. The smart meter will be required to provide control for storage heating loads via an embedded auxiliary contactor. This contactor will be controlled by the meter. This will cater for the existing storage heating circuits in residential premises that are generally switched on and off by a time switch which is controlled from the electricity meter or electricity timer". Yes fully support this, will facilitate the rollout of smart meters into existing building stock, given legacy installed products.

9. Consumer Awareness & Education: Given the disruptive nature of smart products and systems, and indeed the roll out of smart meters themselves, Consumer awareness and education is critical as part of the programme.

10. Consultation doc states "The utility HAN should also accommodate if required a second electricity meter installed to measure actual output of embedded micro generator". Glen Dimplex strongly support the integration of renewable generation, and design future proofing of the same, into the smart meter roll out.

11. Glen Dimplex believe the following should be made available to the consumer HAN via the smart meter, and this should be designed in from early on in the process. Majority of parameters below would be implemented in one of the standard wireless or power line carrier protocols e.g. Zigbee Smart Energy Profile being implemented in various smart grid trials.

    a. Tariff: Price and tariff level [4 energy demand levels CRITICAL, HIGH , MEDIUM, LOW (see table below for explanation) or the provision of something similar allows products and systems in the home to curtail or ramp up energy use based upon this level, and the current energy needs in the home]. The level signals allow a standardization of information flow between the Utility and the appliance without specific prices being needed or processed.

Energy Demand Level	Description
Low	Period where there is no energy demand therefore no need for load shed, sometimes referred as a maintenance mode: when to charge batteries, run routine maintenance, etc.
Medium	Period where there is not a significant energy demand.
High	Period of High energy demand, load shedding is recommended during this period.
Critical	Period of Critical energy demand, load shedding is required during this period.

b. Time (local time [day, month, year, hour, minutes, seconds), tariff (level and/or price), Note: clock synchronization alluded to re Gas meter input functionality in the consultation document. From an appliance perspective, if accurate real time is available over the consumer HAN, this is extremely valuable for delivering service to the home. Whereas the appliance will need to run its own real time clock in the event of HAN failure, this is considerably less costly to implement than an accurate real-time clock in a stand alone product.
c. Power kW: sent from the smart meter over the HAN at intervals of no less than 10 seconds. The sense of the power should also be included in the parameter i.e. positive for power import, negative for power export i.e. on site renewable generation exceeds onsite load.
d. Status HAN:

Below are less essential but of use to appliances:

e. Historic kWh
f. Weather/temperature outside conditions.

Notes:

1. In 2009 the average dwelling in Ireland consumed 23,136kWh of energy; of this 18,069 kWh was fossil fuel based and 5,067 kWh was electricity. This contributed to ca 25% of CO2 emissions. Although not referenced in the report ca 60% of domestic energy is used for space and water heating. REF SEAI report: Energy in Ireland 1990 – 2009 (2010 Report).