



Commission for Energy Regulation

An Coimisiún um Rialáil Fuinnimh

## CER National Smart Metering Programme Steady State Model

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## CER – Information Page

### Abstract

CER are publishing this consultation to seek views and evidence from interested parties on the Steady State Model (SSM) for the National Smart Metering Programme (NSMP).

In the July 2012 Decision Paper (CER12008), CER outlined the high level requirements for the design and functionality of the national smart metering end-to-end technology solution including metering, communications and back-end IT systems. The July 2012 Decision Paper focussed on the capabilities at a technology component level within the overall Smart Metering Architecture (i.e.) a 'bottom-up' approach.

This consultation paper introduces the concept of a Steady State Model (SSM) which outlines an initial 'top down' view of what a mature end-to-end Smart Metering solution may look like.

CER plans to make a decision on the design of the SSM by December 2013.

### Target Audience

This paper is for the attention of members of the public, the energy industry, energy consumers and all interested parties.

### Related Documents

NSMP documentation is available on the CER website [here](#).

Responses to this consultation should be returned by email, post or fax and marked for the attention of Programme Office (National Smart metering Programme) at the CER.

**The CER intends to publish all submissions received.** Respondents who do not wish part of their submission to be published should mark this area clearly and separately or enclose it in an Appendix, stating the rationale for not publishing this part of their comments.

## Executive Summary

### Introduction

In the July 2012 Decision Paper (CER12008), CER outlined the functionality and high level requirements for the design of the national smart metering end-to-end technology solution including metering, communications and back-end IT systems. The July 2012 Decision Paper focussed on the capabilities at a technology component level within the overall Smart Metering Architecture (SMA)<sup>1</sup> (i.e.) a 'bottom-up' approach. The Paper outlined a range of options at component level which were to be refined during the next Programme phase.

This consultation paper outlines a steady state mode. The model has been developed taking account of a number of different factors:

1. Identification of the strategic role of each stakeholder.
2. Identification and alignment with a set of five Design Principles including a principle of customer focus.
3. Review of the issues, options and requirements gathered to date from Industry stakeholders.
4. Review of the technology requirements as outlined in the July 2012 Decision Paper and options considered in the December 2012 Information Papers.
5. Consideration of best practice in the design of complex technology solutions with a focus on delivering appropriate technical solutions which will minimise capital and operating cost.

### High Level Evaluation

It is CER's view that the steady state model and associated key working assumptions outlined in Section 5.2 offers a cost efficient, appropriately incentivised solution and avoids an over-prescriptive model that may reduce future innovation. This view is based on the high level evaluation provided in Sections 5.3 and 5.5.

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<sup>1</sup> The NSMP Smart Metering Architecture (SMA) comprises the back-office supplier systems, industry market messaging, and the Automated Meter Infrastructure (AMI). The AMI will be delivered by the Networks organisations.

In summary, the key working assumptions outlined in Section 5.2 supports a retail market model where:

- Back office systems perform the majority of data processing and hold ‘Master’ versions of key data sets, such as customer account balance.
- Minimal functionality and data is held on the smart meter.

### **Purpose of this Paper and Next Steps**

The purpose of this paper is to seek the views of the public and any interested parties on the various elements outlined in this document including:

1. Stakeholder roles
2. Market design principles
3. Critical functions
4. High level evaluation of the market design
5. Other working assumptions that impact on market design and data flows in the market

The CER plans to issue two consultation papers on this topic (this paper in July 2013 and a further paper in October 2013). Responses from interested parties to this July consultation paper will be taken into consideration when the CER is developing the October paper.

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## 1.0 Introduction

### 1.1 The Commission for Energy Regulation

The Commission for Energy Regulation ('the CER') is the independent body responsible for overseeing the regulation of Ireland's electricity and gas sectors. The CER was initially established and granted regulatory powers over the electricity market under the *Electricity Regulation Act 1999*. The enactment of the *Gas (Interim) (Regulation) Act 2002* expanded the CER's jurisdiction to include regulation of the natural gas market, while the *Energy (Miscellaneous Provisions) Act 2006* granted the CER powers to regulate electrical contractors with respect to safety, to regulate to natural gas undertakings involved in the transmission, distribution, storage, supply and shipping of gas and to regulate natural gas installers with respect to safety. The *Electricity Regulation Amendment (SEM) Act 2007* outlined the CER's functions in relation to the Single Electricity Market (SEM) for the island of Ireland. This market is regulated by the CER and the Northern Ireland Authority for Utility Regulation (NIAUR). The CER is working to ensure that consumers benefit from regulation and the introduction of competition in the energy sector.

### 1.2 Purpose of this paper

The purpose of this paper is to seek the view of the public and the CER's stakeholders with regard to the SSM. In order to make an informed and impartial decision on this topic, the CER wishes to obtain comments from members of the public, the energy industry, Consumers and all interested parties. The CER commits to considering all views equally and affording each respondent the opportunity to clarify any issue raised in this paper.

### 1.3 Background Information

This document builds on a significant body of information and analysis conducted by CER as part of the NSMP and forms a key part of the work that CER is undertaking in Phase 2 of the programme. Given the volume of information available, a summary of the context for this consultation included in section 2.

### 1.4 Structure of this paper

This paper is structured as follows:

- **Section 2.0** provides the **context** of this consultation paper by outlining:

- The NSMP strategic objectives
  - Identifying CER as the legislative authority to conduct the NSMP
  - Providing background on analysis to date by reference to the July 2012 Decision Paper and the December 2012 Information Paper.
  - The current NSMP Work stream structure and related consultation papers.
- **Section 3.0** provides an overview of the expected **strategic role** each stakeholder would perform to drive the SSM.
  - **Section 4.0** identifies and provides a definition for the **Design Principles** which underpin the SSM.
  - **Section 5.0** outlines:
    - A **visual overview** of the SSM critical functions (data flows and processes).
    - The **key working assumptions** of the SSM.
    - A high-level **evaluation** of how the SSM working assumptions aligns to the Design Principles.
    - **Alternative working assumptions** within the SSM, with the same evaluation of how the alternative working assumptions align to the Design Principles.
    - A **conclusion statement** based on the evaluations.
  - **Section 6.0** outlines:
    - The **design process** to identify an optimal SSM across all NSMP work streams.
    - The **next steps** for this consultation process.

Wherever relevant, a list of direct questions related to a topic is included within a particular section. To aid regulatory transparency and assist in the delivery of an efficient consultative and decision making process, the CER asks respondents to address these questions directly in their responses.

**Appendix A** contains a summary list of all of the questions, which the CER has asked in this Consultation Paper. This is designed to be a useful aid to respondents when preparing their submissions and can serve as a “short-cut” for respondents who may not have the resources to devote to preparing a full submission.

Appendix A is also available separately in Word format. We recommend using this document as a template for your response if you are using the “short-cut” option. Responses that have availed of the short consultation option will be evaluated equally by the CER, when making its decision.

### ***1.5 Responding to this paper***

CER invites interested parties to comment on the questions raised in this consultation paper by close of business on Friday 6th September 2013.

As CER will publish responses in full on the CER website, respondents should include any confidential information in a separate Annex, stating the rationale for not publishing this part of their comments.

Please forward submissions on this paper, preferably in electronic format, to:

Smart Metering Programme Office  
Commission for Energy Regulation,  
The Exchange, Belgard Square North,  
Tallaght,  
Dublin 24.  
E-mail: [smartmetering@cer.ie](mailto:smartmetering@cer.ie)

## 2.0 Context

### 2.1 The CER National Smart Metering Programme

A smart meter is an electronic device that can measure the consumption of energy, record and store more information than a conventional meter and provide real time information to the Consumer on usage.

In addition to European energy efficiency targets, there are a number of key EU legislative instruments which require that Consumers are properly informed of actual energy consumption and costs frequently enough to enable them to regulate their energy consumption.

Smart meters can contribute to these targets by:

1. facilitating improved energy efficiency by empowering consumers with more detailed, accurate, and timely information regarding their energy consumption and costs;
2. reducing overall energy bills by shifting any discretionary electricity usage away from (more expensive) peak consumption times;
3. Reducing overall energy consumption thereby helping the environment.

The CER, working closely with the Department of Communications, Energy and Natural Resources (DCENR), established Phase 1 of the Smart Metering Programme (NSMP) in late 2007.

Phase 1 included a plan to conduct a nationally representative smart metering trial in order to assess the costs and benefits of smart meters and to inform decisions relating to the full rollout of an optimally designed universal National Smart Metering Programme. This work was completed in 2011 and the results are available on the CER website [here](#).

### 2.2 Strategic Objectives of the NSMP

The National Smart Metering Programme has the following strategic objectives (which apply to both electricity and gas unless stated otherwise):

1. **Encourage Energy Efficiency** - encourage end-use energy efficiency via enhanced information and pricing signals, resulting in reductions in overall energy usage and thus reduced emissions of carbon dioxide, nitrogen oxides and sulphur oxides as a measure to combat climate change and reduce pollution

2. **Facilitate Peak Load Management (electricity only)** - Reduce demand for peak electrical power, with consequential electricity generation savings and improved security of supply. This can be achieved via pricing signals such as Time of Use tariffs, where the price of electricity varies at different times of the day to reflect the costs of producing electricity at those times. Other options include automated demand side management and direct load control (via aggregators).
3. **Support Renewable and Micro Generation (electricity only)** - Assist in achieving of Ireland's stated national targets for renewable electricity generation (40% by 2020) by facilitating demand response solutions that will complement increasing levels of intermittent wind generation on the electricity grid and to facilitate the wider take up of micro generation.
4. **Enhance Competition and Improve Consumer Experience** - Support more timely and efficient change of supplier process for consumers, and promote competition by enabling suppliers to offer:
  - accurate billing;
  - accurate, detailed and more frequent information on their energy consumption and costs;
  - more innovative products to consumers to support the efficient use of electricity (balanced by the need to protect consumers from a proliferation of complex tariff products leading to confusion); and
  - a more diverse service offerings to consumers from suppliers including in the area of prepayment product offerings
5. **Improve Network Services** - Improve services to consumers, particularly in areas such as meter reading, fault monitoring and electrical power quality. Significantly improve theft prevention and measure losses more accurately.

### **2.3 Data Protection**

Smart metering will deliver a step change in relation to the amount, quality and timeliness of Consumers (electricity and natural gas) consumption information which will require additional analysis in regard to data protection and privacy.

In developing the SSM we have placed a **critical** emphasis on the requirement for **energy consumption data recorded at half hourly intervals and provision to Suppliers on a daily basis**. Suppliers already have access to consumer's energy consumption data through conventional meters and are used to operating within the framework provided by the Data Protection Act 1988 and 2003 (DPA). Similarly, Network operators are required to have policies and procedures in place to ensure the security and integrity of the network is protected at all times. It is of paramount importance to the NSMP to ensure the additional information

from Smart Meters is appropriately controlled in the SSM and all privacy and security issues are properly addressed.

The CER will work in collaboration with the Data Protection Commissioner (DPC) to ensure that the collection and processing of data complies with the provisions of the DPA. In the NSMP December 2012 Information Paper on Data Protection it was signalled that one of the key areas of focus for the NSMP during Phase 2 will be the development of a set of regulatory policy decision papers, which will include a paper on Data Protection, following intensive key stakeholder engagement and a full public consultation process.

To this end, the NSMP intends to work with industry and stakeholders over the coming months working towards a paper on Data Protection for DPC consideration towards the end of the year. One of the key work areas for this stage following an intensive period of stakeholder workshop engagement will be a full review of the requirements for:

- data control, consent and access rights;
- data retention and storage;
- data sharing and disclosure; and
- data use and rectification

The NSMP will retain a strong focus on smart metering data protection and one of the key work areas for this stage, following a full public consultation process will be the development of the regulatory policy and framework for data protection underpinned by a Data Protection Impact Assessment as defined by the Article 29 Data Protection Working Party.

## ***2.4 The July 2012 Decision Paper***

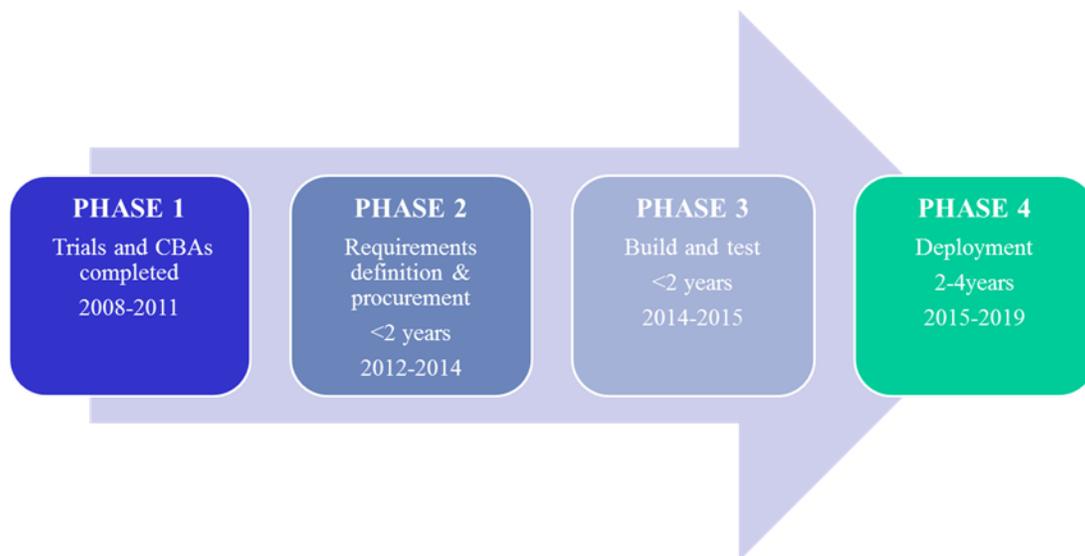
In July 2012, following significant consultation, analysis and trials, CER concluded phase 1 and confirmed their decision to proceed to Phase 2 of the NSMP. CER based this decision on the positive results of the electricity and gas smart metering trials and associated cost-benefit analyses published during 2011. The decision is further underpinned by relevant European and national legislation, which promote smart metering and outline specific related requirements.

The July paper - 'Decision on the National Rollout of Electricity and Gas Smart Metering' (CER12092) - is available on the CER website [here](#), and highlights a number of key policy decisions:

- Rolling out electricity smart metering to all electricity residential and business consumers currently on non-interval meters.

- Rolling out gas smart metering to all gas residential consumers and business consumers in the G4 meter category.
- Gas smart metering will leverage the electricity smart metering communications infrastructure.
- Mandating the rollout of in-home display (IHD) devices to all electricity consumers – the IHD will be capable of displaying gas information also for dual fuel consumers.
- Mandating energy usage statements (containing detailed consumption and cost information) to be provided by suppliers to their Consumers with their electricity and gas bills.
- Mandating time of use electricity tariffs for all electricity consumers.
- Enabling broader and easier access to prepayment services for electricity and gas consumers.

The paper also outlined the objectives of the NSMP and high-level requirements for the functionality of the end-to-end solution. The timeline for Phase 2 (i.e. the current phase) of the programme was also set out.



## ***2.5 The December 2012 Information Paper***

In December 2012, CER published an Information Paper - National Smart Metering Programme Information Paper Programme Update and Initial Phase 2 Deliverables (CER/12/213) - giving further details of the programme organisation, governance, approach and timelines for the NSMP. This paper is available on the CER website [here](#).

The information paper also gave an overview of some of the completed deliverables from Phase 2 of the NSMP, namely a number of papers, which were produced as part of the High Level Design Stage 1.

## **2.6 NSMP Work Stream Structure**

To facilitate the detailed requirements gathering and definition required in Phase 2 (High Level Design Stage Two), CER identified the following work streams, which are on-going and include representation from Industry stakeholders:

1. **Time of Use tariffs** – seeks to define the time of use tariff mandate.
2. **Consumer Web Interface, Smart Billing and IHD (CSI)** – seeks to define the requirements required to affect Consumer consumption behaviour and the optimal communication channel to deliver these requirements.
3. **Prepayment** – seeks to define the requirements and optimal model for delivering the ‘smart’ prepayment consumer product.
4. **Networks Led** – seeks to define the core smart services to be delivered by the Networks organisations (i.e. ESNB and BGN) plus provide a high level impact analysis on the Retail Market processes.
5. **NSMP Programme Team (Programme Manager, Design Authority & Market Systems Subject Matter Expert)** – leveraging the working assumptions from the above work streams; this function seeks to define an integrated smart metering solution.
6. **Consumer Engagement** – seeks to identify and develop consumer interaction methods to enable the realisation of the benefits of the NSMP.
7. **Data Protection** – seeks to ensure data protection considerations are addressed in the design of the integrated smart metering solution.

A set of decision papers representing a consistent design across all the above work streams is planned to be issued in December 2013, which will provide the next level of detail to the smart metering design in Ireland.

## **2.7 Relevant Consultation Papers**

### **2.7.1 ToU Tariffs Consultation Paper**

Following the decision in the July 2012 paper to mandate time of use tariffs for all electricity Consumers, and the information report published in December, CER created a time of use tariff work stream, as outlined above, with the specific aim of defining the shape of the time of use tariff mandate.

In parallel to this Consultation Paper, the ToU tariffs work stream has issued a consultation paper which outlines their initial suggestions in the context of the wider programme. It provides a number of evaluated examples of how the

mandate could be shaped. The Consultation Paper is specifically seeking views on these examples and would also appreciate views on the impact of each example.

### **2.7.2 CSI Consultation Paper**

Following the decision in the July 2012 paper relating to the presentation of information to consumers, and the information report published in December, CER established a work stream to determine the requirements and design for a Consumer Web Portal (C), a Smart Bill Statement (S) and the mandated In-Home Display (I). These elements have been consolidated under the CSI work stream.

The CSI consultation paper is scheduled to be issued in August 2013 and will inform subsequent developments relating to the Mandated In-Home Display (MIHD) and 3<sup>rd</sup> Party Access, which are referenced in this SSM document, but are not being consulted on at this stage.

### **2.7.3 Prepayment Consultation Paper**

Following the decision in the July 2012 paper to enable broader and easier access to PP services and the information report published in December, CER established a work stream to determine the requirements and design for a PP solution.

The PP consultation is scheduled to be issued in August 2013 and will inform subsequent developments relating to the SSM. Prepayment considerations are referenced in this SSM document, but are not being consulted on at this stage.

## 3.0 Stakeholder Roles

This section identifies the expected role each stakeholder will need to play to deliver the NSMP strategic objectives. The stakeholder role definitions are aligned to the existing 'as-is' stakeholder roles (i.e.) the Smart Metering business processes are considered an enhancement, and not a significant deviation, of existing stakeholder business processes.

The definition of the strategic role per stakeholder enabled the definition of the critical functions for the SSM.

### Overview of SSM Stakeholder Roles

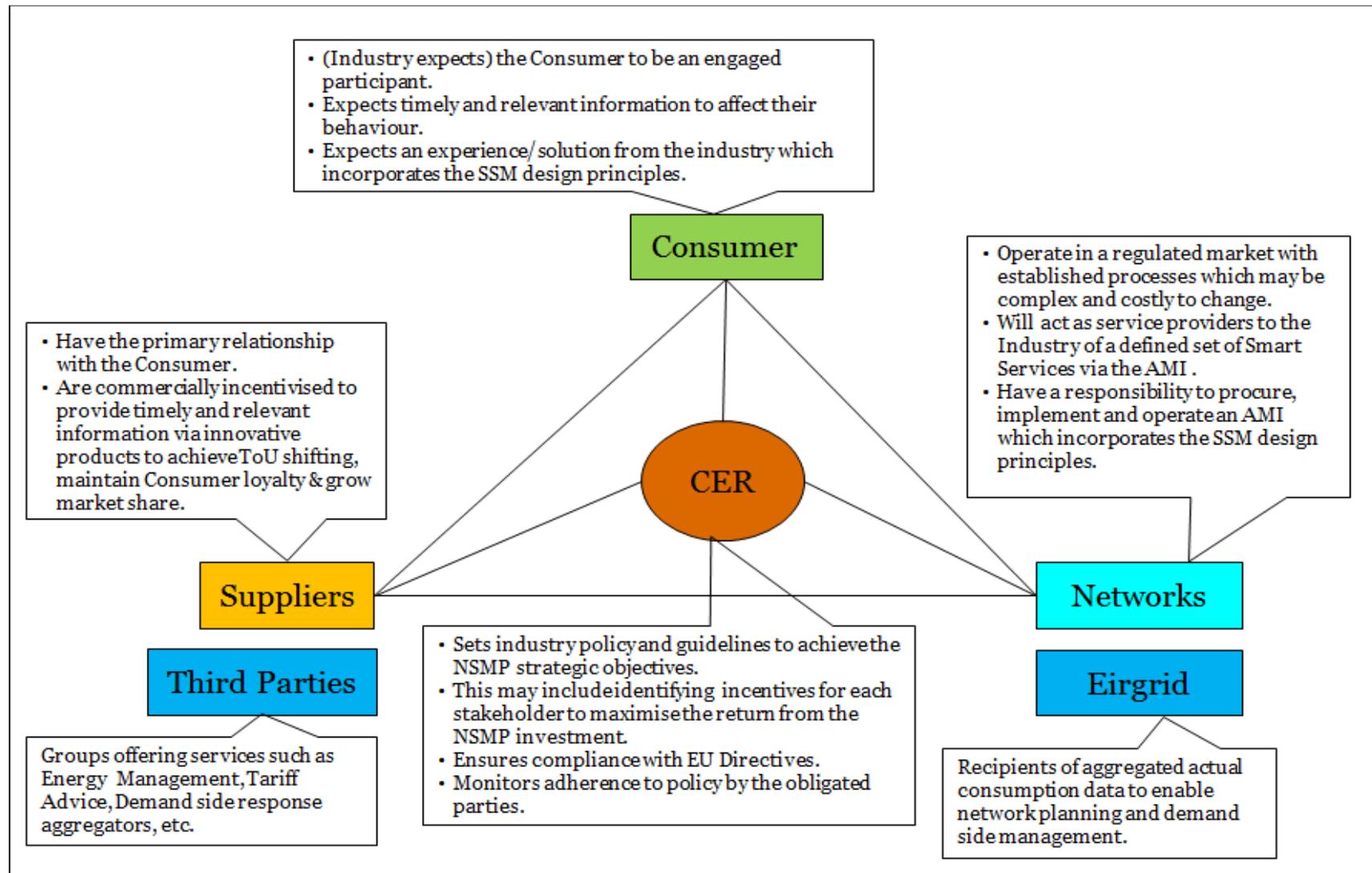
The roles outlined below are the expected strategic role each stakeholder would perform within the SSM:

1. **Consumer** - (Industry expects) the Consumer to be an engaged participant. A key benefit to the Consumer will be the availability of timely and relevant information to increase energy awareness, affect their consumption behaviour and reduce their energy costs.
2. **Networks** - will act as service providers to the Industry of a defined set of Smart Meter Services via the AMI.
3. **Suppliers** - have the primary relationship with the Consumer and are best positioned to affect Consumer behaviour. This includes the provision of a Consumer Web Interface (CWI) for their Consumers and the ownership of centralised data repositories, such as Consumer account balance.
4. **Eirgrid** – are recipients of aggregated actual consumption data to enable network planning and demand side management.
5. **CER** – sets the Industry policy for Smart Metering and will perform oversight to ensure compliance to policy by obligated parties.
6. **Third Parties** – it is recognised that there may be new entrants seeking to establish direct relationships with the Consumers or with the industry stakeholders in order to manage energy consumption behaviour.

Figure 1 below outlines the expected strategic role each stakeholder would perform within the SSM. For each stakeholder, a comment box is provided to summarise the key functions a stakeholder would perform.

Please note that this paper considers only the primary stakeholders most impacted by the SSM functions and/or use of the SSM data. It is acknowledged that other stakeholders exist and have a role to play in determining the overall Smart Metering design, such as the European Commission, DCENR, Data Protection Commissioner, Standards Bodies, etc.

**Figure 1: SSM Stakeholder roles**



**Consultation Questions:**

1. Do you believe the stakeholder roles outlined in Figure 1 are the appropriate roles to deliver the NSMP strategic objectives? If not, please outline alternative roles per stakeholder.
2. Have we clearly defined the stakeholder roles outlined in Figure 1? If not, what further explanation is required?

## 4.0 Design Principles

This section identifies and defines a set of design principles which underpin the SSM.

The SSM working assumptions are evaluated in the next section, as to their alignment to these design principles.

### 1. **Consumer focussed**

- a. The consumer experience is ‘front of mind’ for all the design working assumptions underpinning any SSM.
- b. Consumer data protection should be “built-in” to the SSM from the outset.

### 2. **Consistent & integrated solution** – the SSM design should:

- a. Offer a consistent experience for all stakeholders regardless of the type of fuel (i.e.) electricity or gas, or Consumer product (e.g. Credit or Prepayment).
- b. As per best practice technology design, ensure each technology component can deliver its own requirements whilst functioning together in an integrated way to drive optimal process efficiencies. This also applies to data security and data storage considerations.

### 3. **Scalable & Future Proofed**

- a. Scalable – the SSM design should seek to:
  - i. Provide stakeholders the potential for economic growth.
  - ii. As per best practice technology design, provide the ability for the underlying technology, which supports the industry business model, to accept an increase or decrease in data volumes without impacting the overall performance of the technology solution.
- b. Future Proofed - the steady state model design must act as an enabler of future innovation and development in:
  - i. Technology communications and devices in general.
  - ii. Home Energy Management solutions.
  - iii. The energy market as a whole.

### 4. **Cost Efficient** – as per the July 2012 Decision paper, ultimately the guiding principle will be to ensure the most cost-effective end to-end National smart metering solution is implemented through a public procurement process.

### 5. **Irish Market Context** – in designing a SSM, consideration must be given to the nuances of the Irish market, such as:

- a. The scope of the national smart metering rollout will cover all residential consumers and a significant proportion of small-to-medium enterprise (SME) consumers (i.e.) all gas consuming SMEs currently in the G4 meter category and all electricity consuming SMEs currently with non-interval meters. Thus, the scope of the national rollout would cover circa 2.2 million electricity consumers and circa 600,000 gas consumers. In

- addition, it is acknowledged that the NSMP strategic objectives are predominately achieved via the Electricity market.
- b. A regulated market for Networks and a de-regulated competitive market for Suppliers.
  - c. The potential complexities associated with introducing timely changes to the ‘as-is’ Irish Electricity and Gas Market Processes.

Given the above nuances of the Irish Market, the NSMP will reference lessons learned from international experience in rolling out Smart Meters, but always mindful of the appropriateness of such deployment models within the Irish context.

<b>Consultation Questions:</b>
<ol style="list-style-type: none"><li>3. Do you believe the design principles outlined in Section 4.0 are appropriate for the evaluation of the SSM? If not, please outline alternative design principles.</li><li>4. Have we clearly defined the design principles in Section 4.0? If not, what further explanation is required?</li></ol>

## 5.0 Overview of SSM

This section provides:

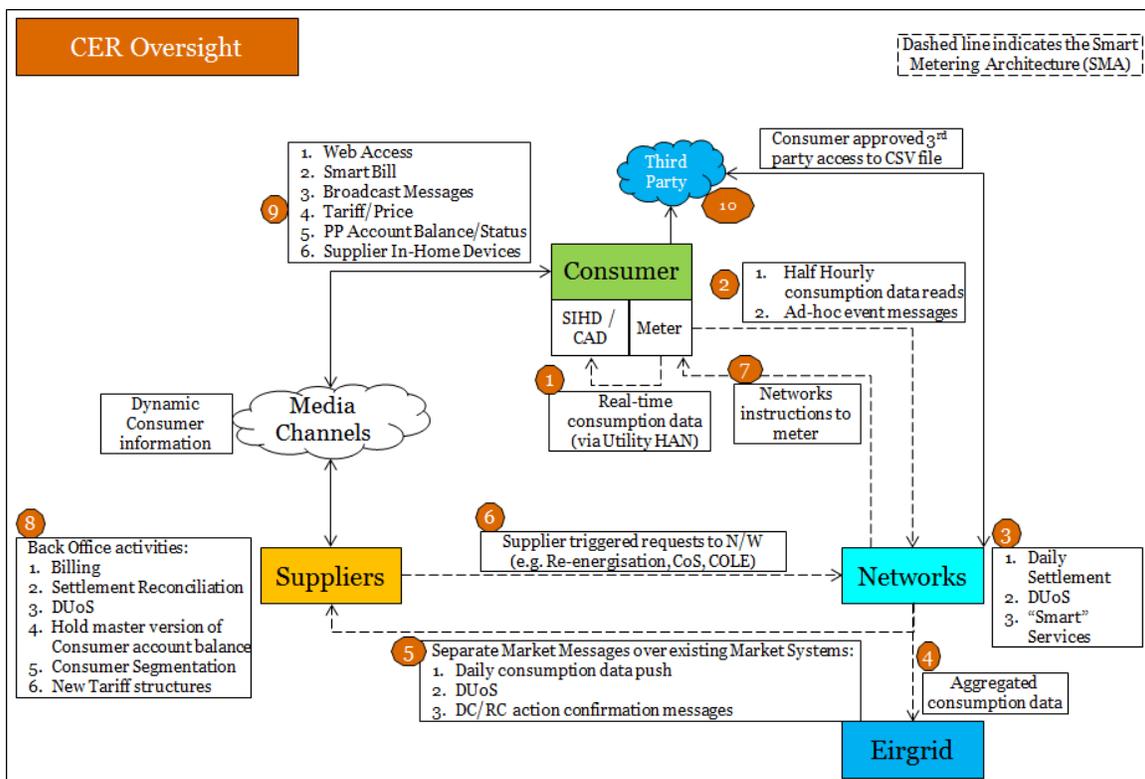
1. An illustration of the critical functions of data flows and processes within the SSM. Please refer to Appendix B for a step-by-step high level explanation of the critical functions.
2. An outline of the key SSM working assumptions.

### 5.1 Critical Functions

Taking direction from the expected stakeholder roles outlined previously, the diagram below illustrates the critical functions of data flows and processing activities within the SSM.

Please note this is not a comprehensive illustration of all potential data flows amongst stakeholders within the SSM.

**Figure 2: SSM Critical functions**



### Consultation Questions:

5. Do you believe the critical functions outlined in Figure 2 clearly articulate the key data flows, processes/messages within the SSM?

## 5.2 Key Working Assumptions

With reference to the critical functions outlined above, the table below summarises the key working assumptions.

**Table 1: Key SSM Working Assumptions**

Area	Description
<b>Consumption Data</b>	Interval consumption data is provided to Suppliers on a daily basis via enhancements to the existing Market Messaging System.
	Real-time consumption data is available in the home provided over the Utility-HAN.
	The provision of consumption information via the Utility HAN is available for any subsequent in-home devices.
<b>Stakeholder Roles</b>	Suppliers own the Consumer relationship and can develop products and services to support innovative ToU tariff structures.
	Suppliers are the most appropriate parties to present consumption and cost data to Consumers via non-SMA channels (e.g. Supplier led web access, IVR/call centre, alternative in-home device, paper bill, etc.).
	Suppliers drive media channel communications with Consumers.
	Suppliers/3rd Parties can develop products and services to utilise the availability of ‘real-time’ consumption data in the home and could access this data via alternative Media Channels more frequently than the daily provision of consumption data by the AMI.
	Half Hourly consumption interval data will be available to Networks enabling daily settlement activities and DUoS calculations based on Consumer actual consumption.
<b>Cost Data</b>	The SMA does not carry price or calorific value related information messages, as it is envisaged price/tariff data may change regularly and could alter dynamically within day. It is therefore considered best to transmit this type of data via alternative Media Channels under Supplier control (e.g. Supplier led web access to Consumers, IVR/call centre, alternative in-home device, paper bill, etc.).

Area	Description
<p><b>Prepayment</b></p>	<p>Suppliers can choose to use a variety of media communication channels to provide PP Consumers with their status in relation to credit values; debt position; threshold warnings; emergency credit; warning of disconnections, etc. Each of these sets of information is presented without interaction with the Smart Meter.</p>
	<p>The Supplier holds the “master version” of the PP status (based on the latest available daily interval data). The meter does not carry any PP specific parameters/values.</p>
	<p>The Supplier issues any disconnect and reconnect instructions (similar to existing market processes) over the SMA to the meter, according to the Consumer’s account status.</p>
<p><b>Ad hoc event messages</b></p>	<p>It is anticipated that there will be ad hoc confirmation messages returned over the SMA, depending on the Market Message type (e.g. a confirmation message will be sent to Suppliers for any DC/RC events).</p>

Consultation Questions:
<p>6. Do you believe Table 1 represents appropriate key working assumptions underpinning the SSM?</p>

### 5.3 Alignment of SSM Working Assumptions to Design Principles

The table below outlines a high level evaluation of how each of the SSM working assumptions aligns to the Design Principles outlined in Section 4.0.

**Table 2: Key SSM working Assumptions and Design Principles**

<b>SSM Working Assumption</b>	<b>Consumer Focussed</b>	<b>Consistent &amp; Integrated Solution</b>	<b>Scalable &amp; Future-Proofed</b>	<b>Cost Efficient</b>	<b>Irish Market Context</b>
<b>Consumption Data</b>	Provides timely and relevant information to enable Consumers to change their behaviour.	<ul style="list-style-type: none"> <li>• Common for all consumers types (i.e. dual fuel, Credit &amp; PrePayment).</li> <li>• Timely and detailed information for all stakeholders.</li> </ul>	<ul style="list-style-type: none"> <li>• Consumption data is available via the U-HAN to devices in the home.</li> <li>• Enables the full flexibility of information usage for market and product development.</li> </ul>	Utilises existing market systems and message structures.	<ul style="list-style-type: none"> <li>• Suppliers and 3<sup>rd</sup> Parties can enhance the Consumer relationship by providing innovative products and services based on 'richer' data.</li> <li>• Improves Network services.</li> </ul>
<b>Stakeholder Roles</b>	Improved consumer services (e.g. CoS, CoLE) & competitive choice.	Richer data and consistency across industry processes (e.g. Settlement based on actual consumption)	Allows potential for greater access for 3 <sup>rd</sup> Parties without reliance on industry market processes.	Positions Stakeholders, who are commercially incentivised, to recover their costs.	Encourages the innovation of products and services in a de-regulated market.

<b>SSM Working Assumption</b>	<b>Consumer Focussed</b>	<b>Consistent &amp; Integrated Solution</b>	<b>Scalable &amp; Future-Proofed</b>	<b>Cost Efficient</b>	<b>Irish Market Context</b>
<b>Cost Data</b>	As tariffs become more dynamic, the model encourages a greater choice of communication channels to present information to Consumers.	The AMI’s primary focus is on key data flows to (e.g. provision of Consumption data)	Encourages future innovations in the technology space in how information could be presented to Consumers, by avoiding a de-facto prescriptive solution.	<ul style="list-style-type: none"> <li>• Avoids the need for an overly resilient AMI communications solution, thereby reducing development and operational costs.</li> <li>• Simpler functionality on the Smart Meter.</li> </ul>	Avoids the need for potential new industry design processes and messages.
<b>Prepayment (PP)</b>	Offers greater Consumer choice via facility to switch from Credit to PP (and vice versa).	<ul style="list-style-type: none"> <li>• Common account balance process for all Consumers (PP and Credit).</li> <li>• Common meter functionality for both Credit and Prepayment processes.</li> </ul>	No dependency on the AMI to communicate potentially frequent credit messages over the AMI solution.	<ul style="list-style-type: none"> <li>• As above</li> <li>• Potentially fewer “contingency” interventions required (e.g. field visits)</li> </ul>	As above

**Consultation Questions:**

7. Do you believe the Table 2 is a fair high level evaluation of how the SSM working assumptions align to the Design Principles?

### 5.4 Alternative Working Assumptions

It is recognised that alternative data flows and processes may be required within the SSM to allow for:

- *Work Stream requirements* – other NSMP work streams, as identified in Section 2.7, may identify requirements which can only be delivered via an alternative means to those outlined in the SSM critical functions.
- *Transition* – where the SSM is not deployed from Day One of the Smart Metering roll-out due to ‘readiness’ factors surrounding back office business processes/systems, concerns over Consumer understanding of consumer products which the SSM will enable (e.g. dynamic ToU structures), etc.

The above factors may influence the type, number and volume of data flows within the SSM. The table below follows the same structure as the table outlined in Section 5.2 and indicates a set of contrasting working assumptions which affect the nature and volume of data traffic over the SMA. The impact of these alternative working assumptions on the SSM critical functions are considered in more detail in Appendix C.

**Table 3: Alternative Working Assumptions**

Area	Description of the impact of alternative working assumption(s) on the SSM
<b>Consumption Data</b>	No change to Table 1.
<b>Stakeholder Roles</b>	No change to Table 1.
<b>Cost Data</b>	Price and calorific value information is sent over the SMA to the Smart Meter. The Meter will then perform necessary calculations to present cost information on the Meter or over the Utility HAN.
<b>Prepayment</b>	Based on the information taken from cost data messages sent over the SMA, the meters themselves calculate and present the “real-time” status of all relevant parameters (e.g. credit; debt; emergency credit; threshold and disconnect warnings).
	The Supplier receives daily notification of the PP status and can conduct any necessary account reconciliations in their back office systems to establish correct credit value (e.g. for Calorific Value corrections).

Area	Description of the impact of alternative working assumption(s) on the SSM
	A credit message instruction is required over the SMA to the meter for all Consumer account payment transactions and any account reconciliation messages.
<b>Ad hoc event messages</b>	As with other market processes, it is anticipated that there will be confirmation messages returned over the SMA to acknowledge successful completion of any requested action, albeit these volumes will be higher as a result of the above differences for cost data and Prepayment.

<b>Consultation Questions:</b>
8. Do you believe Table 3 represents appropriate working assumptions that reflect alternative ways of delivering certain critical functions of the SSM?

### ***5.5 Alignment of Alternative Working Assumptions to Design Principles***

The table below outlines a high level evaluation of how each of the alternative working assumptions aligns to the Design Principles outlined in Section 4.0.

**Table 4: Alternative Working Assumptions and Design Principles**

<b>SSM Working Assumption</b>	<b>Consumer Focussed</b>	<b>Consistent &amp; Integrated Solution</b>	<b>Scalable &amp; Future-Proofed</b>	<b>Cost Efficient</b>	<b>Irish Market Context</b>
<b>Consumption Data</b>	No change to Table 2				
<b>Stakeholder Roles</b>	No change to Table 2				<ul style="list-style-type: none"> <li>• Greater reliance on Networks provided services</li> <li>• Possible accreditation of 3<sup>rd</sup> Parties who may wish to use AMI service.</li> </ul>
<b>Cost Data</b>	A default AMI solution may reduce incentives to innovate, thereby reducing the options on information presentation to the Consumer.	Provides a default industry solution for presenting cost data to the Consumer.	May constrain incentives to develop innovative products, if the AMI solution is not scalable for complex pricing.	<ul style="list-style-type: none"> <li>• Additional cost data flows introduce operational complexity and risk.</li> <li>• More complex functionality on the Smart Meter</li> </ul>	New industry processes and messages may be required.

<b>SSM Working Assumption</b>	<b>Consumer Focussed</b>	<b>Consistent &amp; Integrated Solution</b>	<b>Scalable &amp; Future-Proofed</b>	<b>Cost Efficient</b>	<b>Irish Market Context</b>
<b>Prepayment</b>	<ul style="list-style-type: none"> <li>As above</li> <li>Consumers have the option to view their account balance on the meter.</li> </ul>	Separate account balance processes for PP consumers, in contrast to Credit consumers.	Greater message volumes will require more “contingency” interventions (e.g. field visits)	As above, with further meter complexity and greater Utility-HAN specification.	As above

**Consultation Questions:**

9. Do you believe Table 4 is a fair high level evaluation of how the alternative working assumptions align to the Design Principles?

**5.6 Conclusion**

It is CER’s view that the SSM and associated working assumptions outlined in Section 5.2 offers a cost efficient, appropriately incentivised solution and avoids an over-prescriptive Smart Metering Architecture which may reduce future innovation. This view is based on the high level evaluation of how these working assumptions align to the Design Principles, as provided in Section 5.3 and 5.5 above.

**Consultation Questions:**

10. Do you agree with the conclusion presented in Section 5.6? If Yes or No, please provide supporting commentary.

## 6.0 Next Steps

### 6.1 Design Process

The CER is cognisant that variants of the SSM outlined in this document are feasible and are under consideration in other jurisdictions based on evaluations and impact assessments which optimally meet their jurisdiction's/market's particular requirements.

To support a comprehensive evaluation process to determine an SSM that will optimally deliver the NSMP strategic objectives and the CER's legal duties, the approach outlined below is proposed:

1. The other NSMP work streams such as CSI, PP, ToU and Data Protection, will continue with the 'bottom-up' approach to gather their respective requirements. Through this approach, a set of core or 'must-have' requirements will be identified. These work streams will carry out their own evaluations, including:
  - a. evaluation of each requirement based on evaluation criteria particular to their work streams
  - b. identification of the cost and benefit impacts per requirement
2. The work streams will impact assess if and how the requirements emerging from the 'bottom-up' approach align with the SSM in this document. In addition, the work streams will consider the alternative working assumptions outlined in Section 5.4 to identify an optimal technical model to deliver a particular work stream requirement.
3. As a result, the 'bottom-up' approach will provide an input to determining the optimal SSM.
4. In addition to the 'bottom-up' approach, additional assessments of the SSM will also be required. These include inputs and advice from the Data Protection Commission, CER's legal remit, Consumer engagement, Cost Benefit Analysis.

Arising from this design process, the SSM could largely remain as it is, or variants to the SSM could emerge, or indeed a model which is in complete contrast to the SSM could emerge.

## 6.2 Timelines

The NSMP plans to issue two Consultation papers for the SSM, namely:

1. **SSM Consultation Paper 1 (July 2013)**

This consultation paper introduces the concept of a SSM for the Smart Metering solution which is a high level 'top-down' view on what a mature high level end-to-end Smart Metering solution may look like.

This first SSM paper does not consider the transitional arrangements between current processes and an SSM end state. The design process, outlined in Section 6.1 above and the proposed content of SSM Consultation Paper 2, will enable:

1. Identification of an optimal SSM, and
2. Identification of an end-to end model which is required to meet requirements for 'Day One' of the Smart Metering roll-out

2. **SSM Consultation Paper 2 (target issue date October 2013)** will include the following:

- a. Feedback from Consultation Paper 1.
- b. An evaluation of all functionality required by the NSMP work streams to identify a 'minded to' position on an optimal SSM. At a minimum, the evaluation process will consider how the optimal SSM:
  - i. Accommodates the NSMP work stream requirements
  - ii. Delivers on the NSMP Strategic Objectives
  - iii. Aligns to the design principles outlined in Section 4.0.
- c. Identification of any variants to the optimal SSM which are required to enable the initial roll-out stages of Smart Metering

## Appendix A – List of Consultation Questions

Appendix A provides a consolidated list of questions asked throughout Consultation Paper.

**The aim of this section is to allow for a “short-cut” option for respondents to submit their comments to the CER.** Respondents will be invited to complete the table to indicate their position on the questions being asked. Respondents should outline YES or NO answers to each of the questions listed. If they have a further comment which will clarify their answer, this should be included in the Comments box. Appendix A will be published alongside the Consultation Paper in Word format.

Please note: Respondents are in no way obliged to respond to the questionnaire provided and are welcome to submit comments in their preferred format. When preparing responses respondents should indicate which question or proposal their text refers to.

#	Question/ Proposal	Yes	No	Comments
1	Do you believe the stakeholder roles outlined in Figure 1 are the appropriate roles to deliver the NSMP strategic objectives? If not, please outline alternative roles per stakeholder.			
2	Have we clearly defined the stakeholder roles outlined in Figure 1? If not, what further explanation is required?			
3	Do you believe the design principles outlined in Section 4.0 are appropriate for the evaluation of the SSM? If not, please outline alternative design principles.			
4	Have we clearly defined the design principles in Section 4.0? If not, what further explanation is required?			
5	Do you believe the critical functions outlined in Figure 2 clearly articulate the key data flows, processes/messages within the SSM?			
6	Do you believe Table 1 represents appropriate key working assumptions underpinning the SSM?			

#	Question/ Proposal	Yes	No	Comments
7	Do you believe the Table 2 is a fair high level evaluation of how the SSM working assumptions align to the Design Principles?			
8	Do you believe Table 3 represents appropriate working assumptions that reflect alternative ways of delivering certain critical functions of the SSM?			
9	Do you believe Table 4 is a fair high level evaluation of how the alternative working assumptions align to the Design Principles?			
10	Do you agree with the conclusion presented in Section 5.6? If Yes or No, please provide supporting commentary.			

## Appendix B – Step-by-Step explanation of SSM Critical Functions

This section outlines the data flows and processes for each of the numbered steps in Figure 2. For each step;

- a. Reference is made, wherever possible, to the relevant statements in the July 2012 Decision Paper.
- b. The key business drivers for each data flow are outlined.
- c. The technical model to deliver the business driver(s) is outlined.

With reference to the steps outline below, the SSM anticipates significant changes to the amount, quality and timeliness of Consumers (electricity and natural gas) consumption information. This increase in available data results in a number of key questions that need to be addressed regarding **data protection**. In developing the SSM, it is acknowledged that data security and data privacy are of paramount importance. Future work will include an evaluation of the SSM taking into consideration data access, data storage and data processing requirements.

### Step 1 - Real-time consumption data (via the Utility HAN)

*Extract from July 2012 Decision Paper CER 12008*

#### **Decisions Relating to Ownership, Display and Provision of Smart Metering Data/Information** (Applies to electricity and gas unless stated otherwise)

##### **6. In-Home Data (Pages 59-60)**

- a. In-home displays (IHDs) will be provided to all energy consumers as part of the full rollout during their electricity smart meter installation.
- b. The IHDs will cater for dual fuel consumers.
- c. Definition of the IHD's minimum functionality will be determined during the Design stage.
- d. The IHD device will be supported for two years after its installation date (i.e. repairing or replacing faulty devices).
- e. Over time other devices in the home should be able to receive the consumption data from the smart meter.

##### **Non-Utility HAN (Page 79)**

1. The non-utility HAN refers to devices in the home other than utility meters and the mandated IHDs rolled out. The functionality for the smart metering full rollout solution should enable secure communications between the smart meter and in-home devices (i.e.) any authenticated device in the home and not just the mandated in-home display.

3. Cost information is part of the requirements for display of data in-home. However, how exactly price information is provided to the in-home devices (i.e. via the smart metering infrastructure or via another method e.g. IP based) will be examined further as part of the Design stage of Phase 2.

#### **Data Access for Consumers (Page 59)**

d. Consumers will receive cost and usage based consumption information via in-home displays (IHD) and energy statements (with their bills).

### ***Business Drivers***

Real-time consumption data is required to proactively affect customer energy consumption behaviour.

### ***Technical Delivery Model***

The SSM model indicates the provision of consumption data only over the Utility HAN (U-HAN) to other devices in the home. In the SSM, other devices in the home that will be able to receive consumption data include:

- a. **Supplementary IHD (SIHD)** – these devices could be made available as an alternative to the Mandated IHD (MIHD) according to Supplier or Consumer preference when the MIHD is no longer functioning or when the expected two year maintenance period has expired. Such devices will require secure pairing with the Electricity Smart Meter (ESM) over the U-HAN.
- b. **Consumer Access Device (CAD)** – this is a device (securely paired with the ESM) that provides an interface with the Consumer HAN (C-HAN) to provide consumption data on which further intelligence can be applied. This could include the application of price data (for display on “Any IHD (AIHD) that does not require secure pairing with the ESM), or algorithmic control of end-use/appliances.

Delivery of cost data to devices in the home (other than the MIHD) will be via other media channels provided by the Supplier (or a 3rd Party).

### ***MIHD Strategy***

As per the July 2012 Decision Paper, the MIHD is not considered to be an enduring component of the SSM and hence is not represented on the SSM diagram (see Figure 2). The MIHD will only be supported for two years after its installation date (from the time of the ESM installation). The MIHD is considered an interim solution to provide an initial impetus to affect consumer consumption behaviour and allow alternative means of in-home information presentation to be developed by Suppliers and 3<sup>rd</sup> parties over time.

***MIHD Consumption data***

However, as with other potential devices in the home, real-time consumption data will be provided to the MIHD over the U-HAN. Cumulative consumption data for electricity and gas information (e.g. interval; daily; weekly), and meter register data may also be broadcast to the MIHD. **The CSI consultation process will address these requirements.**

***MIHD Cost data***

As per the July 2012 Decision Paper, cost information will be presented to Consumers on the MIHD. **The CSI consultation process will address this cost information requirement.**

***Provision of Consumption Data over the U-HAN***

The instantaneous kWh consumption being recorded at the ESM will be broadcast over the U-HAN at [n] second intervals. This frequency requirement, and an equivalent “proxy” for gas data (based on 30 minute data availability), will be determined by the CSI consultation process in accordance with the specifications for the MIHD.

**Step 2 - Half Hourly consumption data reads & ad hoc event messages*****Extract from July 2012 Decision Paper CER 12008*****Decisions Relating to Ownership, Display and Provision of Smart Metering Data/Information** (Applies to electricity and gas unless stated otherwise)**1. Data Granularity (Page 59)**

- a. Half hourly intervals for electricity consumption data.
- b. Half hourly intervals for gas consumption data.

***Business Drivers***

Half Hourly interval data reads enable the following functionality and processes:

1. Accurate presentation of historical consumption trends to the Consumer to affect their consumption behaviour.
2. Accurate Consumer billing based on actual consumption.
3. Accurate settlement by Networks with the wholesale market based on actual consumption at a Consumer level.
4. An Industry wide charging model based on actual consumption at a Consumer level and a move away from existing generic profiles, estimates and reconciliations.

5. Support more timely and efficient change of supplier processes for consumers
6. Support more flexible and diverse service offerings to consumers

Ad-hoc event messages will provide confirmation that meter instructions have been completed; and provide a range of non-consumption information that will help to serve the NSMP objectives (but are not addressed in detail here).

### ***Technical Delivery Model***

Interval data for electricity and gas (time-stamped to periods ending on the hour and on the half-hour), and cumulative meter register readings will be returned to the respective ESN and BGN Meter Data Management Systems (MDMS). This will be provided on a daily basis up to and including midnight of the previous day.

Ad hoc event messages will be provided to the respective ESN and BGN MDMSs at time periods to be agreed. These may either be part of a routine scheduled daily download or as separate downloads that may be more or less frequent than daily depending on their criticality to the effected business process.

## **Step 3 - Networks Back Office Processing**

### ***Extract from July 2012 Decision Paper CER12008***

#### **5. Improve Network Services**

- Improve services to consumers, particularly in areas such as meter reading, fault monitoring and electrical power quality.
- Significantly improve theft prevention and measure losses more accurately.

### ***Business Drivers***

1. As per step 2 above, Half Hourly interval data enables the introduction of an Industry wide charging model based on actual consumption at a Consumer level and a move away from existing generic profiles (e.g. calculation of DUoS charges).
2. Within the SSM, Networks would be the stakeholder responsible for holding a Master version of Consumer consumption data on behalf of all Industry stakeholders.
3. Networks will provide a range of “smart services” that represent changes or additions to existing service levels. This will also include monitoring and maintenance of the SMA.

### ***Technical Delivery Model***

It is assumed that the Networks organisations (ESBN and BGN) will leverage MDMS capability and their existing technology platforms to enhance their back office processes to accommodate Half Hourly interval data, meter register reads, and additional smart data services. ESBN and BGN will conduct daily settlement activities and DUoS calculations and prepare the provision of data for the relevant industry parties.

Based on the information collected, the Networks business will conduct a range of data validation exercises (including completeness and accuracy checks).

The Networks business will then prepare the data for provision to Suppliers, including the calculation of any necessary estimates and reporting on the performance of the Automated Meter Infrastructure (AMI)<sup>2</sup> reading process highlighting any missing readings.

It should be noted that this processing relates to Information Capture and preparation of Information Provision to Industry (Suppliers and Settlements). Nothing is inferred here that the interval consumption is made readily available to Networks business for other operational and planning purposes.

## **Step 4 - Aggregated Consumption Data (for Eirgrid)**

### ***Extract from July 2012 Decision Paper CER12008***

#### **2. Facilitate Peak Load Management**

- Reduce demand for peak electrical power, with consequential electricity generation savings and improved security of supply. This can be achieved via pricing signals such as Time of Use tariffs, where the price of electricity varies at different times of the day to reflect the changes in the costs of producing electricity.
- Other options include automated demand side management and direct load control (via aggregators).

### ***Business Drivers***

1. More timely, accurate and more cost-efficient settlement processes.
2. Aggregated actual consumption data enables more robust network planning and facilitates the introduction of demand side management solutions.

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<sup>2</sup> NSMP Automated Meter Infrastructure (AMI) relates to the components to be procured by Networks (i.e.) the components required to facilitate data processing from and including the Meter Data Management Systems (MDMSs) to the Meters and Mandatory IHD (inclusive).

### ***Technical Delivery Model***

Aggregated data will be provided by Networks to Eirgrid for settlement purposes on a daily basis. In addition, Eirgrid could be provided with consumption data (aggregated as required) in order to understand consumption patterns, develop network operational and planning strategies, and address peak load management.

## **Step 5 - Market Messages using existing Market Systems**

### ***Extract from July 2012 Decision Paper CER 12008***

#### **Decisions Relating to Ownership, Display and Provision of Smart Metering Data/Information** (Applies to electricity and gas unless stated otherwise)

##### **2. Data Access for Suppliers (Page 59)**

a. Data portal will be provided through which suppliers can access data for their Consumers, updated daily, on a push and/or pull basis subject to their requirements (assuming this is technically and economically feasible – Design stage of a full rollout would explore this further, as well as the fair processing requirements of the Data Protection Acts).

### ***Business Drivers***

1. Suppliers require interval consumption data and cumulative meter register readings provided to them on a daily basis in order to provide the necessary services to end Consumers and meet the NSMP objectives.
2. Additional supplementary data (e.g. export kWh) may also be necessary to provide a full range of services to Consumers.

### ***Technical Delivery Model***

In accordance with the stated intent in the July 2012 Decision Paper to further explore a possible data portal solution, the SSM has progressed the solution to stipulate a “push” basis for the provision of data over existing Market systems, for both Electricity and Gas consumption data.

Further technical reviews by Networks indicated that the existing Market systems can accommodate the anticipated consumption data volumes removing the need to invest in alternative technology channels (i.e.) a new data portal, to pass this data to Suppliers. It is assumed that Networks will issue the requisite data that will be provided to Suppliers over existing market message mechanisms – the exact details of which are still to be determined.

Other existing market processes are being considered by the Networks-Led work stream addressing core smart meter services that can be conducted over existing market messaging. The Networks-Led work stream will also consider any new smart data and service elements (e.g. provision of non-consumption data, confirmation of action messages, AMI performance reports, and how they will be communicated to Suppliers. The provision of daily values for DUoS/TUoS will also be considered.

## **Step 6 - Supplier triggered requests to Networks**

### ***Extract from July 2012 Decision Paper CER 12008***

#### **Electricity Smart Meter Functionality Decision (Page 67)**

8. Remotely operable embedded switch for de/re-energisation.

#### **Gas Smart Meter Functionality Decision (Page 71)**

1. Remote disconnection instruction (valve closure)
2. Remote reconnection enablement instruction (health and safety validation checks required to allow consumer to self-re-connect / open valve)

#### **Smart Metering Wide Area Network (WAN) Communications High Level Functionality Decision (Page 74)**

The WAN communications layer of the smart metering system will have the following functionality:

- Facilitate two-way communication with the backend smart metering infrastructure.
- Facilitate remote operation of the meter to de-energise and re-energise the Consumer (subject to safety arrangements).

### ***Business Drivers***

Smart Metering introduces a range of business process requests which can be initiated by Suppliers to be processed by Networks. Smart metering data and remote instruction capabilities offer the opportunity to review these business processes to make them more efficient, reduce the dependency on manual intervention in the existing processes, etc. Examples of such Supplier initiated business processes include Change of Supplier (CoS), Change of Legal Entity (COLE), De/Re-energisation, Lock/Unlock.

### ***Technical Delivery Model***

Many of these may be existing messages that can remain largely unchanged within the market messages but will be processed differently by Networks. For example, actual meter readings will be readily available within Networks systems to process CoS or COLE events on an accurate reading. Other messages, such as a de-energisation (lock) or re-energisation (unlock) requests, will require

validation by Networks to comply with possible new codes of practice in this area, prior to forwarding to the meter. In some instances a return confirmation message may be required.

**The Networks Led work stream** will perform a high-level analysis of the impact of introducing such Smart Metering capabilities on the existing Retail Market processes and new AMI system capability.

## **Step 7 - Networks instructions to the Meter**

### ***Extract from July 2012 Decision Paper CER12008***

As per the extract in Step 6 above.

#### ***Business Drivers***

1. To service supplier products or possibly 3<sup>rd</sup> party products (e.g. demand response aggregators) in the operation of certain functions or parameters on the meter.
2. Conduct AMI asset maintenance and diagnostic services. Examples of such Networks initiated business processes include load limiting, load switching, firmware upgrades, ad hoc AMI diagnostics, etc.

#### ***Technical Delivery Model***

As described in Step 6, there will be a range of business process requests that Suppliers will require Networks to validate action, confirm completion and bill against. In some instances these requests may require an instruction message to the meter (e.g. de-energisation (lock); re-energisation (unlock); load limiting; load switching, etc.)

Networks will also be able to action any internally validated requirements to send instructions to the meter (e.g. load limiting/switching) in accordance with any new codes of practice in this area.

Networks will also be required to action any AMI maintenance controls/upgrades.

As per the July 2012 Decision Paper, two-way communication with the backend smart metering infrastructure will enable processes to be processed by Networks remotely.

A detailed analysis of the impact of introducing Smart Metering on existing Retail Market processes is planned for 2014.

## Step 8 - Suppliers Back Office Processing

### *Extract from July 2012 Decision Paper CER12008*

#### **4. Enhance Competition and Improve Consumer Experience (page 42)**

- Promote competition by enabling suppliers to offer more innovative products to consumers, particularly in the electricity retail market by enabling suppliers to create innovative pricing arrangements that can be offered to consumers to support the efficient use of electricity, such as Time of Use electricity tariffs. This will need to be balanced by the need to protect consumers from a proliferation of complex tariff products leading to confusion which could negate the positive aspects of greater competition.
- More accurate billing of consumers with the elimination of estimated billing except in exceptional circumstances.
- Support more timely and efficient change of supplier process for consumers.
- Support more flexible and diverse service offerings to consumers from suppliers including in the area of prepayment product offerings. Smart metering will facilitate a greater expansion of prepayment offerings as it will remove a number of current obstacles in the market to the wider take-up of prepayment services by consumers.
- Empower consumers to make better decisions regarding their energy use by providing them with accurate, detailed and more frequent information on their energy consumption and costs.
- Support any specific needs of vulnerable consumers to ensure they can reap the benefits of smart metering.

#### ***Business Drivers***

Suppliers can provide competitive products to their Consumers in order to operate efficiently and profitably, and gain market share.

1. Half Hourly interval consumption data will provide Suppliers a new level of data granularity or 'data richness' to enhance their existing back office processes.
2. Within the SSM, Suppliers would be the stakeholder responsible for holding a centralised master version of Consumer data sets such as Consumer Account balance. (Note: an exception to this, as mentioned in Step 3 above, is where Networks will be responsible for the master version of Consumer consumption data). This rich centralised view will enable more efficient follow-on processes, such as the presentation of detailed consumption information to the Consumer.

### ***Technical Delivery Model***

1. As outlined in Step 5, the existing Market systems will pass Half Hourly interval Consumer consumption data on a daily basis to Suppliers. Suppliers existing back office processes/systems will need to be reviewed as to how this increased level of data volume is processed.
2. Please note that the back office functions listed in Figure 2 are intended to highlight a selection of Supplier processes which will be impacted by Smart Metering. Suppliers should consider the implications of all the NSMP consultation papers on their respective processes and systems.

## **Step 9 - Information presentation to the Consumer (by Suppliers)**

### ***Extract from July 2012 Decision Paper CER12008***

#### **Decisions Relating to Ownership, Display and Provision of Smart Metering Data/Information** (Applies to electricity and gas unless stated otherwise)

##### **4. Billing Content, Frequency and Tariffs (Page 59)**

(b) The CER has decided that consumers must receive an energy statement with their energy bills – minimum content requirements will be determined during the Design stage, taking into account requirements from relevant EU and national legislation.

##### **3. Data Access for Consumers (Page 59)**

a. The consumer owns their consumption data generated by smart metering and they should have access to the information in relation to their historical consumption data in a national harmonised format, free of charge – this may be via the same data portal assumed to be used by suppliers (design stage of a full rollout would explore this further).

### ***Business Drivers***

As per the stakeholder roles identified in Section 3.0 of this document and the July Decision Paper extract above, Suppliers own the relationship with the Consumer and therefore are best positioned to affect Consumer behaviour.

### ***Technical Delivery Model***

1. The SSM anticipates a scenario where flexible tariff structures and dynamic price messages exist. To facilitate this scenario, timely and relevant information is required to be presented to the Consumer to influence behaviour. It is proposed that the AMI is not the optimal communications channel to provide this information and should be provided via other Media Channels. Suppliers will be able to choose their media as to how they notify

Consumers of any changes to dynamic tariff structures and prices to meet new codes of practice for such products.

2. The SSM proposes that Suppliers will:
  - a. Provide a Consumer web interface (CWI) to allow Consumers view their detailed consumption and cost history; and provide other information services.
  - b. Provide a smart bill statement (paper or electronic format)
3. The SSM assumes the following activities which Suppliers can further consider:
  - a. Broadcast messages based on enhanced Consumer segmentation profiles, including Prepayment notification services
  - b. Provide Supplier specific in-home devices
  - c. Provide Supplier consumer products (e.g. Software Applications (Apps)), which could source “real-time” consumption information from the CAD (See Figure 4).

**The TOU consultation process, in conjunction with the CSI consultation process will further consider the requirements for presenting information to Consumers.**

## **Step 10 - Third Party Access**

*Extract from July 2012 Decision Paper CER 12008*

### **3. Data Access for Consumers (Page 59)**

- b. Consumers will have the right to provide their detailed historical consumption data to other suppliers in order to get an alternative quote for their supply (design stage of a full rollout would explore how this is facilitated).
- c. Consumers can give permission to other third parties to access their detailed historical consumption data (e.g. for energy management services). Design stage of a full rollout would explore how this is facilitated.

### ***Business Drivers***

1. The SSM empowers Consumers to self-authorise and provide their detailed historical consumption data to 3<sup>rd</sup> parties.
2. Self-authorisation by Consumers addresses any data protection concerns in this area.
3. By accessing a Supplier provided Consumer Web Interface, other data sets such as price information, could be provided by Consumers to 3<sup>rd</sup> parties.

***Technical Delivery Model***

1. The SSM proposes that the Consumer will be able to download data (consumption and cost) from the Supplier led CWI and send such data to a 3<sup>rd</sup> party (that may include another supplier).
2. Where a Consumer has changed Supplier, it is envisaged that the Consumer will still be able to access any valid historical data through a process/mechanism still to be decided.
3. In addition, based on Consumer authorisation, a Third Party could request Networks to provide Consumer historical consumption data (e.g. 24 months of consumption data in CSV file format).

**The CSI consultation process will further address this Third Party Access information requirement.**

## Appendix C – Step-by-Step explanation of SSM Critical Functions based on alternative working assumptions

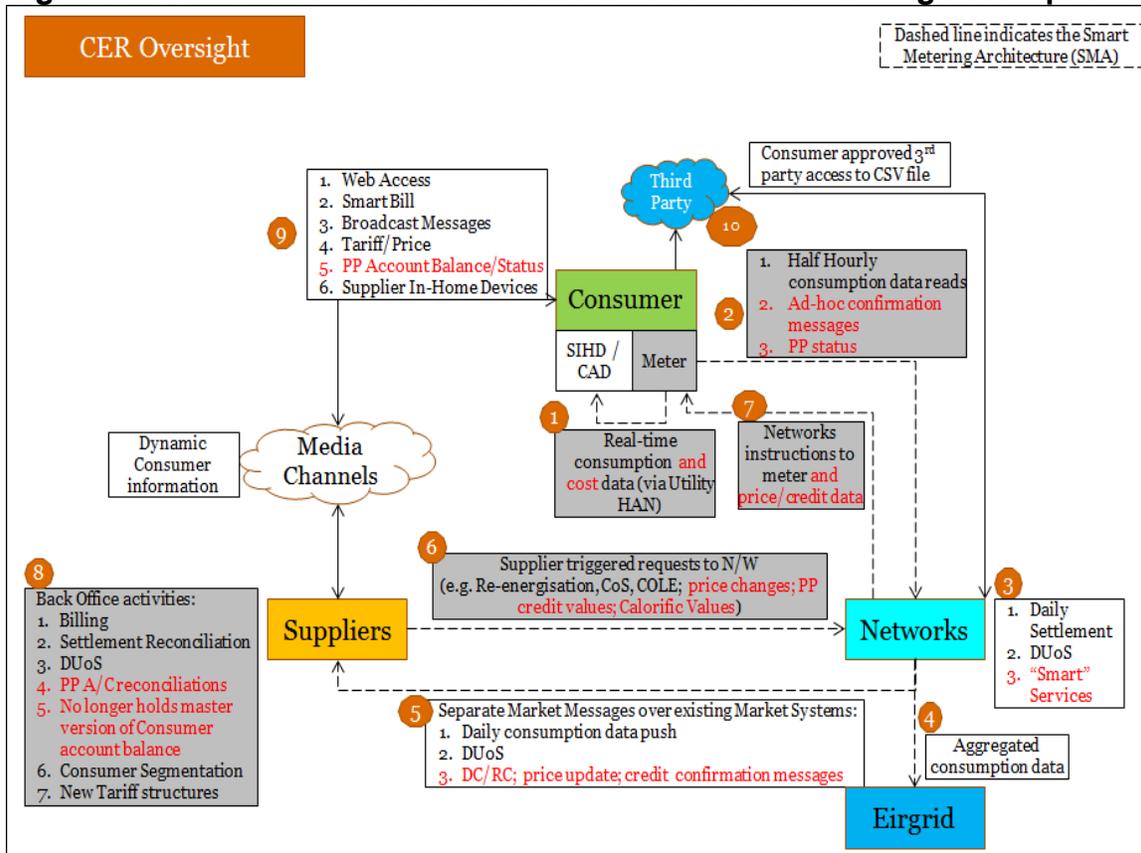
As per Appendix B, this section outlines the functions/data flows for each of the numbered steps in Figure 2 **highlighting only how they differ** from the SSM steps, based on the alternative working assumptions as outlined in Section 5.4:

Taking direction from the stakeholder roles outlined in Section 3.0, the diagram below illustrates how the SSM critical functions differ when introducing the alternative working assumptions.

The following legend applies to figure 3 below:

- In comparison to the initial SSM critical functions, the ‘greyed-out’ boxes indicate the functions/data flows where the business processes are now significantly different.
- In comparison to the initial SSM critical functions, the text in red font indicates new data flows or data flows with increased volume.

**Figure 3: SSM Critical functions based on alternative working assumptions**



## **Step 1 - Real-time consumption and cost data (via the Utility HAN)**

In addition to the provision of consumption information, real-time cost data will be provided over the U-HAN for use by in-home devices based on tariff price information and calorific values provided to the meters via the SMA.

## **Step 2 - Half Hourly consumption data reads & ad hoc event messages**

There will be an increase in the volume of ad-hoc event/confirmation messages (ultimately back to Suppliers) to support additional Supplier initiated events such as price changes, calorific value updates, PP credit values (i.e. reflecting a Consumer payment transaction).

In addition, there will be additional message functionality relating to provision of Prepayment status messages.

## **Step 3 - Networks Back Office Processing**

There will be a greater volume of “Smart Service” activities required due to the need to handle more process/instruction requests, providing confirmation messages, and the additional message functionality of Prepayment.

## **Step 4 - Aggregated Consumption Data (for Eirgrid)**

No change to the SSM.

## **Step 5 - Market Messages using existing Market Systems**

There will be additional message types to be returned to Suppliers confirming meter instructions completed (e.g. price update; credit values; Prepayment status, etc.)

## **Step 6 - Supplier triggered requests to Networks**

In order to service the additional price information and PrePayment features that now reside on the meter, there will be more processes to be conducted and messages to be issued to Networks for actioning.

## **Step 7 - Networks instructions to the Meter**

Further to the additional Supplier requests to Networks, these instructions will have to be forwarded as instructions or parameter updates (price; credit) to the meter.

## **Step 8 - Suppliers Back Office Processing**

There will no longer be a 'Master' balance of account position held in Supplier back office systems for Prepayment Consumers, since the latest account position will be held on the meter itself.

In the case of gas, the meter will only have an estimated calorific value against which to perform its calculations. This will require reconciliation calculated in the back office systems and transferred to the meter, possibly through an amendment to the credit value on the meter.

## **Step 9 - Information presentation to the Consumer (by Suppliers)**

This channel to the Consumer remains the same as under the Centralised SSM. However, this is now an optional route for the provision of cost data into the home, since the SMA must provide the facility to communicate price to the meter to allow the display of consumption and cost data.

## **Step 10 - Third Party Access**

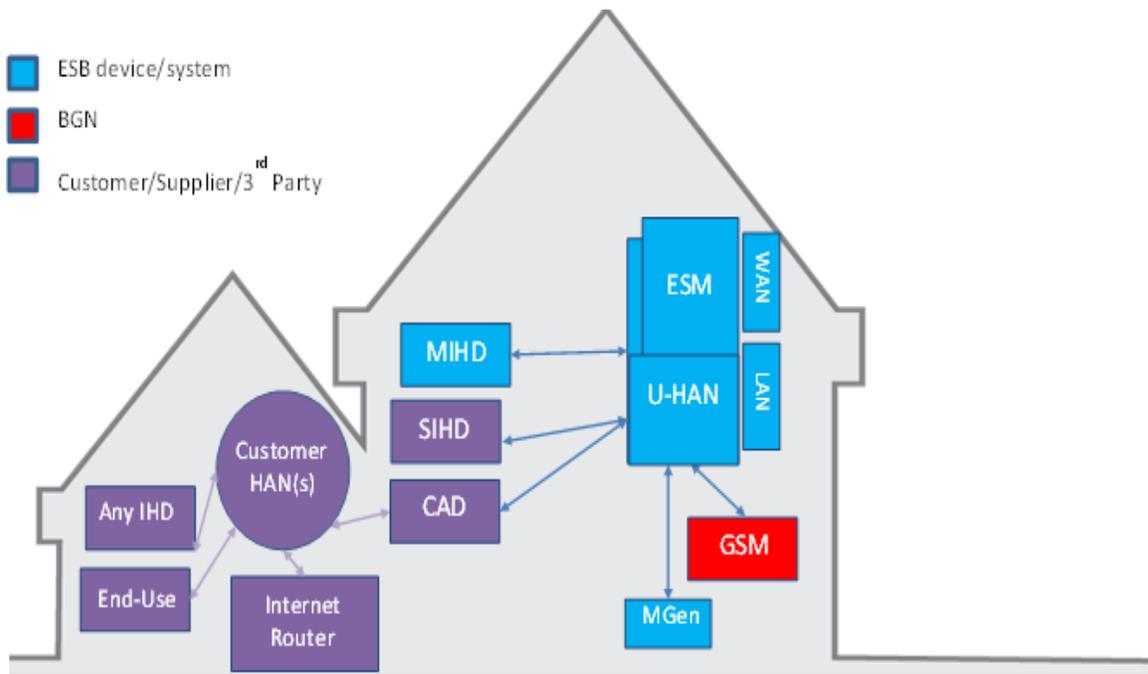
No change to the SSM.

## Appendix D - Overview of technology components in the Home

This section provides an illustration of the technology components which could exist in the Home.

Please note that only the components highlighted in Blue and Red will be provided as part of the Smart Metering roll-out programme. Other components illustrated can be sourced by the Consumer through other means.

**Figure 4: Technology components in the Home**



An explanation of the terms identified in the diagram is provided in the glossary of terms below.

## Appendix E – Glossary of Terms

Table 5: Glossary of Terms

Term	Description
<b>NSMP</b>	National Smart Metering Programme
<b>SSM</b>	Steady State Model
<b>ESM</b>	Electricity Smart Meter
<b>CWI</b>	Consumer Web Interface
<b>SMA</b>	Smart Metering Architecture; the SMA comprises the back-office supplier systems, industry market messaging, and the Automated Meter Infrastructure (AMI).
<b>AMI</b>	The Automated Meter Infrastructure (AMI) relates to the components to be procured by Networks. The scope of the AMI includes all the components required to facilitate data processing from and including the Meter Data Management Systems (MDMSs) to the Meters and Mandatory IHD (inclusive).
<b>DUoS</b>	Distribution Use of System
<b>TUoS</b>	Transmission Use of System
<b>TOU</b>	Time of Use – relates to tariffs that are charged at different prices for different periods (e.g. day, week, month, season, etc.)
<b>CSI</b>	Includes the following areas: <ul style="list-style-type: none"> <li>• Consumer Web Interface</li> <li>• Smart Billing</li> <li>• In-Home Display</li> </ul>
<b>NIAUR</b>	Northern Ireland Authority for Utility Regulation
<b>DCENR</b>	Department of Communications, Energy and Natural Resources
<b>G4</b>	G4 Gas Meter Category
<b>IHD</b>	In-Home Display
<b>IVR</b>	Interactive Voice Response
<b>WAN</b>	Wide Area Network (a communication method from devices in the field to a central collection point)
<b>Utility-HAN (U-HAN)</b>	In-Home communication between the ESM and specific securely paired devices.
<b>Non-Utility HAN / Consumer-HAN (C-HAN)</b>	In-Home communication between devices not associated with the ESM or the SMA.
<b>GSM</b>	Gas Smart Meter. Communicates to the ESM over the U-HAN

<b>Term</b>	<b>Description</b>
<b>MGen</b>	Micro-Generation Smart Meter. Communicates to the ESM over the U-HAN.
<b>MIHD</b>	Mandatory In-Home Display as provided by ESBN and supported for 2 year period after ESM installation. Communicates with the ESM via the U-HAN.
<b>SIHD</b>	Supplementary In-Home Display that may be provided by the Consumer; Supplier; or 3rd Party. Securely paired with the ESM via the U-HAN to take consumption data.
<b>CAD</b>	Consumer Access Device that may be provided by the Consumer; Supplier; or 3rd Party. Securely paired with the ESM via the U-HAN to take consumption data. Interfaces via an unspecified communications technology (C-HAN) with other devices in the home that may include “Any IHD” or end-use devices.
<b>Any IHD</b>	Any other in-home device to present data to the Consumer. Does not require any secure pairing with the ESM since this is achieved via the CAD. This may include existing Consumer devices (e.g. TVs, tablets, phones, PCs, etc.)
<b>End-Use</b>	Any other in-home device to either present data or take instructions from the CAD. May include appliance/end-use control.
<b>Internet Router</b>	Consumer/Supplier/3rd Party owned router to provide additional data/information/instructions into the home that may apply additional features to the consumption data provided via the ESM/CAD, e.g.: price to cost data presentation.
<b>SME</b>	Small to Medium Enterprise
<b>CoS</b>	Change of Supplier
<b>CoLE</b>	Change of Legal Entity
<b>ESBN</b>	Electricity Supply Board Networks
<b>BGN</b>	Bord Gáis Networks
<b>MDMS</b>	Meter Data Management System