Smart Metering Gas Market Processes
Initial Impact Assessment

BORD GÁIS
NETWORKS

Contents

Revision History		
Version	**Date**	**Revision Description**
1.0	3rd Dec, 2012	Published to Industry
1.1	6th Dec, 2012	Minor changes following CER review

1. Introduction

The introduction of Smart Metering will impact gas market systems and processes. Changes to the Code of Operations will be required to facilitate Smart Metering. This work will require input from Shippers to the smart metering project in terms of the following:

- Code of Operations – Market Process and Code Modifications required due to smart metering, in particular:
    - FAR & Market Settlement – FAR (Forecasting, Allocation, Reconciliation)
    - Annual Quantity & Supply Point Capacity setting
    - Meter Data Services
    - Siteworks Services Agreement
    - Prepayment market processes - thick vs. thin solution, new vending methods etc.
    - Remote disconnection/reconnection of gas supply including safety implications.
    - Definition of market rules in relation to billing tariff/usage information.
- Market Messaging
    - Market Process Definitions – Impact on market messaging system of increased volumes of meter read data
    - Business processes and interactions between BGN, acting as the Distribution Network Operator (DNO), & Shippers in the smart metering context;
    - GasMaP Changes
- Data Protection requirements - Security & data protection; Review of requirements in Ireland as well as industry best practice.

The operation of the Irish retail gas market is enabled by a set of Market Processes and Gas MaP information flows. These procedures are defined in the Code of Operations and in the various Market Process Definition documents "MPDs".

The current list of MPDs is provided in the table below:

	Description
MPD1	Update End User Details
MPD2	Change of Shipper Details & CoS Cancellation NDM
MPD3	Request for Historical Consumption Data NDM
MPD4	End User Assignment
MPD5	Change of Shipper Correction & Amendment
MPD6	Registration
MPD7	Deregistration
MPD8	Meter Read Information
MPD9	Meter Read Query Resolution
MPD10	FAR Allocation Factors
MPD11	Shipper Estimate Read Request
MPD12	Periodic MRS Reporting
MPD13	Monthly Distribution Billing and Reconciliation
MPD14	Notification for Read Cycle Updates
MPD15	Management of Appointments
MPD16	Creation and Completion of Operational Site Works Request
MPD17	Cancellation of Operational Site Works Request
MPD18	Safety Lock Notification and Turn-on Meter
MPD19	Management of Site Works Complaints
MPD20	Quotation and New Connection Request
MPD21	Site Works Inspection
MPD22	Site Works Invoicing
MPD23	Creation and Maintenance of Gas Point Address
MPD31	Prepayment Vending Transaction
MPD32	Replacement of PPM Token
MPD33	Financial Statement - PPM
MPD34	Management of Suspense Transaction
MPD35	PPM Service Provider Shipper Invoicing
MPD36	New Outlet Set Up
MPD38	Consuming Locked Process
MPD39	Access to Premises
MPD40	Long Term No Access
MPD41	Revenue Protection Case

The introduction of smart metering will introduce new information flows and market processes. These will include processes covering the installation of smart metering equipment. The introduction of a new Meter Data Management System MDMS will also require the introduction of new market processes.

Bord Gáis Networks will work closely with industry to develop the new data requirements and market processes to facilitate the introduction of Smart Metering. Changes required to existing arrangements will also be considered. The purpose of this paper is to provide an initial assessment of the impact of the introduction of Smart Metering on the existing Gas MPDs.

The Smart Metering Market Processes will be used to:

- Prepare requirements for the Smart Metering system;

- Design interfaces between the MDMS and Shippers; and

- Specify changes to legacy systems.

2. Overview of Required Changes

ERGEG published "Final Guidelines of Good Practice on Regulatory Aspects of Smart Metering for Electricity and Gas" in February, 2011. These guidelines provided the following recommendations for Gas Smart Metering:

- Customer control of meter data;

- Information on actual consumption and cost, on a monthly basis, free of charge;

- Access to information on actual consumption and cost on customer demand;

- Easier to switch supplier, move or change contract;

- Bills based on actual consumption;

- Offers reflecting actual consumption patterns;

- Remote enabling of activation and remote de-activation of supply'

- Alert in the case of exceptional energy consumption;

- Interface with the home;

- Software to be upgraded remotely

BGN's initial assessment indicates that changes arising from the introduction of Smart Metering and to address the recommendations above to existing MPDs are of the following order of magnitude:

	Description	Smart Metering Impact
MPD1	Update End User Details	Low to Medium
MPD2	Change of Shipper Details & CoS Cancellation NDM	Medium to High
MPD3	Request for Historical Consumption Data NDM	High
MPD4	End User Assignment	Medium to High
MPD5	Change of Shipper Correction & Amendment	Medium
MPD6	Registration	Low to Medium
MPD7	Deregistration	Medium
MPD8	Meter Read Information	High
MPD9	Meter Read Query Resolution	High
MPD10	FAR Allocation Factors	Medium
MPD11	Shipper Estimate Read Request	Low to Medium
MPD12	Periodic MRS Reporting	Medium
MPD13	Monthly Distribution Billing and Reconciliation	High
MPD14	Notification for Read Cycle Updates	Low to Medium
MPD15	Management of Appointments	Low to Medium

	Description	Smart Metering Impact
MPD16	Creation and Completion of Operational Site Works Request	Low to Medium
MPD17	Cancellation of Operational Site Works Request	Medium
MPD18	Safety Lock Notification and Turn-on Meter	Medium
MPD19	Management of Site Works Complaints	Low to Medium
MPD20	Quotation and New Connection Request	Low to Medium
MPD21	Site Works Inspection	Low to Medium
MPD22	Site Works Invoicing	Low to Medium
MPD23	Creation and Maintenance of Gas Point Address	Medium
MPD31	Prepayment Vending Transaction	Dependent on PPM Solution developed
MPD32	Replacement of PPM Token	
MPD33	Financial Statement - PPM	
MPD34	Management of Suspense Transaction	
MPD35	PPM Service Provider Shipper Invoicing	
MPD36	New Outlet Set Up	
MPD38	Consuming Locked Process	Medium
MPD39	Access to Premises	Low to Medium
MPD40	Long Term No Access	Medium
MPD41	Revenue Protection Case	Medium

The existing Market Processes were then grouped according to their estimated impact.

Impact	Consequence
Low-Medium	No major change to market facing processes
Medium-High	Market process will use smart rather manual read
High	Market process is likely to change completely. Examples are as follows: - Pre Payment Metering (PPM) processes; - Meter-reading & provision of historical data processes; - Forecasting Allocation & Reconciliation (FAR) processes; - Distribution transportation billing.

Other processes may have implications for industry Code of Practice (COP), for example: Remote supply isolation and Revenue protection.

2.1   Low-Medium Impact

The MPDs listed in the table below will have a Low-Medium Impact on market processes and IT systems:

MPD1	Update End User details
MPD6	Registration
MPD11	Shipper estimate request
MPD14	Notification of read cycle
MPD15	Manage appointments
MPD16/17	Site works requests
MPD19	Site works complaints
MPD 20	Quotation/New connection
MPD21	Site works inspections
MPD22	Site works invoicing
MPD39	Access to premises

It is envisaged that there will be no major change to the above processes arising from the introduction of Smart Metering.

Additional complexity will be managed by IT systems and **hidden** from Shippers. This will include the following items:

- Automate field processes;

- Provision of opening reads;

- Remotely rearm meter, but NOT open valve (SAFETY); and

- The ESBN/BGN interface.

Some processes may not be required in a smart-world – for example MPD11.

2.2   Medium-High Impact

The MPDs listed in the table below will have a Medium-High Impact on processes and Market facing systems:

MPD2	Change of Shipper (COS)
MPD5	COS Correction
MPD4	End-user assignment

The existing Change of Shipper process requires Shippers to provide Meter Reads to complete the process.

In a smart world the MDMS will provide Meter Reads. BGN recommend the use of the end of day read for the Change of Shipper process. The Gas Point Register will need to record the Meter type (Smart or Legacy). Two different COS MPDs may be required. The existing process will be required during the rollout for customers who will not have yet received a smart meter.

2.3   High Impact Processes

2.3.1   Meter-reading processes (MPD 8/9/11/12/14)

Smart-metering will potentially provide daily register-reads and profile data for all customers. It is unlikely to be technically feasible to push this volume of data for c. 640,000 through the existing market messaging infrastructure! In addition it remains to be confirmed if shippers will be provided with all of this data on a daily basis.

The following approaches could be considered:

- Bulk data-file transfer through B2B interface/data-portal for Shippers where daily register-reads and profile data for all customers is provided;

- The existing market processes could be modified to generate a bi-monthly actual register-read plus associated profile data:

    o This would enable Shippers to continue bi-monthly billing cycle and use additional profile data to generate the energy usage statement

- A combination of the 2 above approaches could be employed with e.g. bulk transfer for data analysis and queries with a bi-monthly market message to trigger customer billing.

Other potential modifications may include amendments to Energy Conversion and the Meter Read scheduling processes.

Final energy conversion from m^3 to kWh using a Gross Calorific Value (GCV) will be performed in the back-office system. It may be possible to move from a time-weighted average CV to a daily CV for billing in a smart world (i.e. a load-weighted average CV). Industry also needs to decide how frequently an indicative CV will be sent to the gas meter to perform energy conversion for the IHD.

Data privacy may potentially dictate the meter-read schedule. Data may be retrieved from the gas meter on a daily or bi-monthly basis etc. Shippers may have to inform BGN of the read cycle for their customers which would be dependent on their smart-tariff options etc.

2.3.2   *Forecasting Allocation Reconciliation "FAR" Processes (MPD 10/13)*

The FAR process consists of three main processes:

- Provision of day ahead **forecast** for each NDM shipper

- Provision of estimated gas day **allocation** for each NDM shipper

- **Reconciliation** of estimated consumption with actual consumption for each end-user meter-read.

Forecasting: The Top-Down NDM forecast is calculated by GTMS and FAR simply apportions this between Shippers. BGN could continue to use FAR for forecasting in a smart-world or adopt a new approach, e.g. utilising yesterday's actuals to divide-up forecast. BGN would like to consider Shipper's views regarding this.

Allocation: Gas Day Allocations should be calculated using aggregated actual end of day register-reads **subject** to the technical performance of IT systems. To enable this change, IT systems will have to be able to process data in time for market deadlines.

Reconciliation: The requirement for reconciliation will largely disappear for customers with smart meters and that they will be billed using actual reads from the MDMS.

The above considerations lead to a bigger question regarding the future of FAR. BGN could retain FAR but provide it with more frequent actual meter-reads from the MDMS (e.g. monthly), which would improve its accuracy. This would facilitate a single algorithm for both smart and dumb meters for read estimation, validation and SPC setting processes. Shippers may wish to consider adopting least change option or a phased approach to changes.

It should be noted that FAR also supports a large number of other processes: estimated-reads, meter-read validation and Supply Point Capacity (SPC) setting.

2.3.3   Transportation Billing

BGN are proposing to use actual end of month register-reads to bill commodity charges to Shippers for their smart customer portfolio. BGN will continue to use manual reads and reconciliation during the rollout period for customers who have yet to get a smart meter.

2.3.4   PPM Processes (MPD 31/32/33/34/35/36)

The introduction of the Smart Metering system may enable Shippers to switch meters remotely to and from credit to Prepayment meters. Prepayment customers may have the ability to request their Shipper to remotely top-up their prepayment smart metering system or have the ability to input locally the relevant information to add credit to the prepayment smart metering system.

A review of the following MPDs will be conducted once an approach to Prepayment Metering has been agreed with Industry and approved by the CER:

- MPD31   Prepayment Vending Transaction

- MPD32   Replacement of PPM Token

- MPD33   Financial Statement – PPM

- MPD34   Management of Suspense Transaction

- MPD35   PPM Service Provider Shipper Invoicing

- MPD36   New Outlet Set Up

The Pre-payment solution will change substantially in a smart-world.   The current SIEMENS Quantum technology will be replaced by a new solution. Industry needs to decide whether it wants a Thick or Thin PPM solution. This will have an impact on the technical specification for the Gas Smart Meter.

Industry also needs to decide on the requirement for a centralised or decentralised back-office solution for PPM. If Shippers want a centralised system a decision needs to be made regarding its operation and who would operate it - BGN or other third-party(s)? BGN currently operates the SIEMENS back-office system on behalf of the Irish natural gas industry, and would consider operating the smart back-office. There will be a requirement to support the existing SIEMENS system during the rollout period and potentially for a further period.

2.3.5 Codes of Practice issues

The introduction of Smart Metering will have an impact on the following Codes of Practice:

MPD38	Consuming Locked meter
MPD39	Access to premises
MPD41	Revenue Protection
Other	Site works (Lock meter)

As Remote isolation is possible in smart-world the safeguards provided by site visits will no longer exist. Alternative safeguards may be required in a Smart Code of Practice.

The introduction of smart metering may lead to new revenue protection issues. The definition of tampering needs to be addressed.

2.4 Possible Impact on Individual MPD's

Details of the possible impact of each MPD are outlined below under the following headings:

- GPRO Processes;

- Meter Data Services;

- Operational Siteworks Services

2.4.1 GPRO Processes

MDP1 :   Change of End User

This process is initiated by the Registered Shipper. The MDMS is informed of the Change of End User Data and this will act as a trigger for the MDMS to block access to the previous End User's data.

MDP2:   Change of Shipper Details and CoS Cancellation

Shippers will need to know if a Smart Meter is installed at a Gas Point Address prior to submitting a Change of Shipper request. This process is initiated by the Incoming Shipper that sends a notification message to the MDMS. The MDMS validates that the new Shipper is linked to the relevant Gas Point. A Closing Meter Read will be sent to Outgoing Shipper and the Incoming Shipper will receive an Opening Meter Read. The timings of these notifications may change.

MPD3:   Request for Historical Consumption Data NDM

An Incoming Shipper may request Historical Consumption Data for an End User subject to the End User's consent. Details regarding the level and definition of this Historical Consumption Data need to be developed and agreed with Industry. This data may also be made available directly to the consumer via a web portal.

MPD4:   End User Assignment

This process is initiated by the Registered Shipper. The MDMS is informed of the details of the End User at a specific Gas Point address.

MPD5:   Change of Shipper Correction & Amendment

This process can be initiated by the Incoming or Outgoing Shipper – it may change as a result of the availability of additional actual Meter Read data.

MPD6:   Registration

This process describes the manner in which a Shipper can become recorded as the Registered Shipper at a NDM Supply Point. This MPD needs to be updated to detail the manner in which information will be transferred from the Smart Meter (following a Meter Fit or Unlock) to the MDMS and Gas MaP.

MPD7:   Deregistration

This activity is initiated by a request from the Registered Shipper to lock or prevent the End User from using natural gas at a premises. As Smart Meters may be locked remotely this process will need to be updated.

2.4.2   Meter Data Services

MPD8:   Meter Read Information & MPD12: Periodic MRS Reporting

The introduction of Smart Metering will lead to an increase in the number of Meter Reads that are collected and processed for NDM household customers. This MPD will be updated to provide details of the manner in which these Meter Reads are managed and accessed by the Registered Shipper.

The manner in which Gross Calorific Values and Conversion Factor data is calculated may change.

MPD9:   Meter Read Query Resolution

This MPD will need to be updated to take account of issues arising from Smart Meter readings.

MPD10:   FAR Allocation Factors

It will be possible to aggregate the end of day Meter-register Reads to calculate a more accurate Gas Day allocation for each NDM Shipper. MPD10 will need to be updated to reflect this change.

MPD11:   **Shipper Estimate Read Request**

The use of actual meter-register reads should largely eliminate the need for the requirement for Estimate Reads (once the rollout is complete).

MPD13:   **Monthly Distribution Billing and Reconciliation**

There are also likely to be modifications to the existing rules for billing gas transportation charges to Shippers. The most obvious modification is to eliminate the use of estimated meter-reads for gas billing purposes and, thereby, provide Shippers with a more accurate and timely billing service:

- With smart-metering it should be feasible to read the actual meter-register at the end of each monthly billing period, and used aggregated actual reads to bill gas transportation charges to Shippers;

- The use of actual meter-register reads should reduce the need for the FAR reconciliation process (once the rollout is complete) except for missing meter-reads and customers who have not yet received a smart meter.

MPD14:   **Notification for Read Cycle Updates**

The use of actual meter-register reads may have an impact on the Read Cycle and the notification process.

2.4.3   Operational Siteworks Services

MPD15:   **Management of Appointments**

This MPD will need to be updated to include details of Siteworks Appointments for the installation of or the upgrade to a Smart Meter.

MPD16:   **Creation and Completion of Operational Site Works Request**

Gas smart-metering technology will potentially allow for the remote isolation or restoration of the gas supply, i.e. the remote operation of the integrated-valve in the gas smart-meter. MPD16 needs to be updated to reflect this.

MPD17:   **Cancellation of Operational Site Works Request**

This MPD will need to be updated to include details of the Cancellation of Siteworks Appointments for the installation of or the upgrade to a Smart Meter.

MPD18:   **Safety Lock Notification and Turn-on Meter**

Smart-metering will introduce new functionality, particularly around the potential for remote isolation and restoration of the gas supply. MPD18 will need to be reviewed in light of this.

MPD19: **Management of Site Works Complaints**

This MPD will need to be updated to include complaints with respect to the installation or operation of Smart Meters.

MPD20: **Quotation and New Connection Request**

It is envisaged that the introduction of Smart Metering will have a low to medium impact on this MPD.

MPD21: **Site Works Inspection**

It is envisaged that the introduction of Smart Metering will have a low to medium impact on this MPD.

MPD22: **Siteworks Invoicing**

It is envisaged that the introduction of Smart Metering will have a low to medium impact on this MPD.

MPD23: **Creation and Maintenance of Gas Point Address**

This MPD needs to be reviewed to assess if the introduction of Smart Metering or a new MDMS has an impact on the data contained in this MPD.

MPD38: **Consuming Locked Process**

Smart-metering will introduce new functionality, particularly around the potential for remote isolation and restoration of the gas supply. This MPD will need to be reviewed in light of this.

MPD39: **Access to Premises**

This MPD will be updated as Access to Premises is important for the successful rollout of Smart Metering.

MPD40: **Long Term No Access**

This MPD will be updated as Long Term No Access may prove to be an issue for the rollout of Smart Metering.

MPD41: **Revenue Protection Case**

The smart metering system shall incorporate security logging for physical tampering and electronic security events.

2.4.4   Other requirements

An approach to the following items also needs to be agreed:

- Shipper, Supplier separation;

- Supplier of Last Resort;

- Vulnerable Customers; and

- Free Gas Allowance.

3. New Requirements

The introduction of Smart Metering will also result in the following related changes:

- IHD Requirements
- Gas Industry Web Portal
- Data Protection
- Streamlining with Electricity CoS Processes

Shippers particularly those active in both the Gas and Electricity retail markets are requested to indicate their preference for the streamlining of the Change of Shipper processes.