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Smart Metering – Is there a need for standards?

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Topics to be discussed

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- The basics of a Smart Metering System
- Some of the key drivers
- Some of the conflicts
- Dynamics of gas and electricity networks and appliances used: the consequence for a Smart Metering System
- Issues associated with a Smart Metering System
- Examination of the need for standards
- *And finally:* progress on gas Smart Metering Systems standards work at a European level

Introduction

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- So what is Smart Metering?
  - It means all things to all people
  - There is no generally accepted definition
- It is generally accepted it includes a meter and communication system
  - Data transmission to / from a back office function
- It will probably have some form of storage / retrieval ability either:
  - On the meter
  - In the house via a home display unit or the internet
  - Or a combination of one or more of these

Introduction (Cont)

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- Could it be as simple as this?
- An ETM has two-way communication, ability to update tariffs, a valve to shut-off the gas supply when credit has run out…

ESCO

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- One of the main drivers is the Energy End-use Efficiency Services Directive 2006/32/EC
  - One of its primary objectives is to “improve energy end-use efficiency”. It does this by:
    - Setting indicative targets
    - Providing mechanisms, incentives, ..., legal frameworks to remove market barriers and imperfections that impede the efficient end-use of energy
  - Article 13 is the main Article concerning metering and billing information

ESCO Article 13

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- Article 13: “Metering and informative billing of energy consumption”
  - It covers meters for gas, electricity, heat…
  - It requires that Member States shall ensure that, in so far as it is technically possible (etc.) customers are provided with:
    - Competitively priced individual meters that accurately reflect the customer's actual energy consumption
    - Information on actual time of energy use
    - Information presented is in clear and understandable terms

Note: Energy (kWh) not m^3 or kg as for gas

ESCO Article 13 (Cont)

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- Billing shall be performed frequently enough to enable customers to regulate their own energy consumption
  - The bill to include:
    - Current actual prices and actual consumption of energy
    - Comparisons of the final customer's current energy consumption with consumption for the same period in the previous year, preferably in graphical form
    - Wherever possible, comparisons with an average normalised user of energy of the same user category

Metrological Controls

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- Since 30th October 2006 all new gas meter designs must comply with the Measuring Instruments Directive
- The MID:
  - Has the objective to ensure honesty in transactions and free movement of goods of measuring instruments in the European Union
  - Is goal setting (new approach)
  - Establishes the requirements for specific measuring instruments including gas meters and volume conversion devices

MID (Metrological characteristics)

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- All instruments must meet Essential Requirements (ER) of Annex 1
  - Allowable errors
  - Reproducibility & repeatability
  - Discrimination & sensitivity
  - Durability & reliability
  - Suitability
  - Protection against corruption
  - Information accompanying instrument
  - Indication of results
  - Further processing
  - Conformity evaluation
- Plus instrument specific Annex
  - (MI-002 for gas meters and volume conversion devices)

MID ER Indication of results

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- Annex 1 Essential Requirements, Clause 10
  - Indication of result:
    - Display or hard copy (gas meter: m^3 or kg)
    - Clear and unambiguous and inform the user of the significance of the result
    - Easily read under normal conditions of use
  - Additional indications may be shown provided they cannot be confused with the metrologically controlled indications
  - Whether or not it can be remotely read it shall be fitted with a metrologically controlled display accessible without tools to the consumer
  - Reading of the metrological display is the measurement result that serves as the basis for the price to pay

Issues

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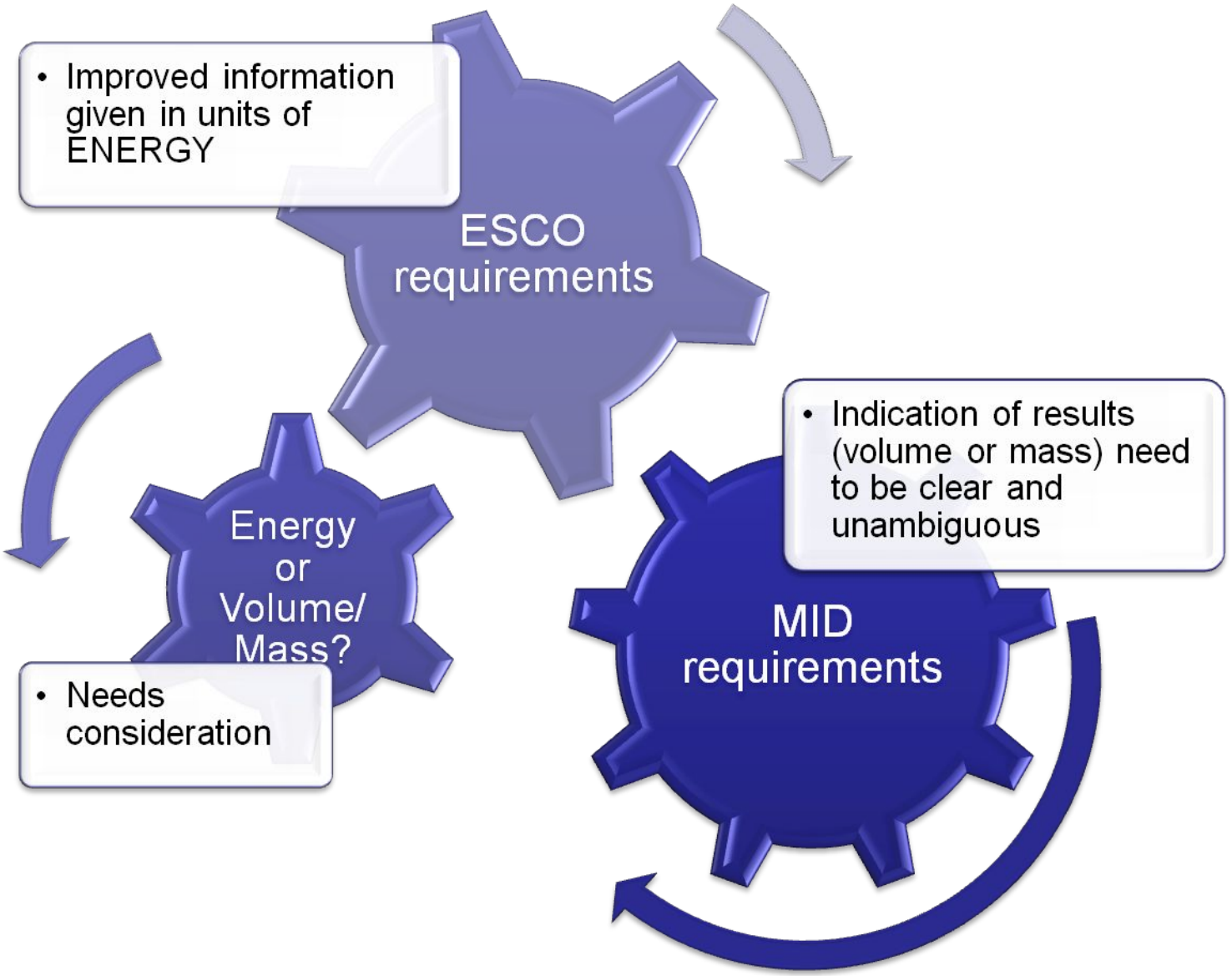

Comparisons: Gas and Electricity

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- The electricity industry has a clearer understanding of how a Smart Metering System can enhance the electricity network's operability
  - Electricity industry requires real-time responses to changes in demand as electricity cannot be stored
  - Smart Metering System could be used as part of a Smart Grid network
- Because of the response of the majority of electrical appliances, consumers may get instantaneous information on how to rationalise their electrical energy use
  - Multiplicity of electrical appliances in the home could lead to complex optimization of electricity consumption by customers
- The electrical industry appear to have a win-win situation by installing Smart Metering Systems

Comparisons: Gas and Electricity (Cont)

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- The gas industry appears to be unclear as to how to obtain the benefits from a Smart Metering System
  - Gas Networks store huge amounts of energy therefore react slowly over time to changes in demand
    - Could a smart meter enhance the gas network operability?
- The range of gas appliances are limited mainly to heating, hot water and cooking
  - The majority of these react slowly to changes in operation
  - It is therefore difficult for the consumer to readily see instantaneous changes to operating behaviours
- Which stakeholder could see the greatest benefit from a Smart Metering System?
  - Improve billing, ability to instantly change tariffs, ease switching process, network modelling

Issues

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- Smart Metering Systems may have different drivers for the gas and electricity market
  - There are some very clear drivers for the electricity system
- The cost benefit analysis may be more difficult to accept for gas than electricity system
- It is possible that the specifications for functionality between the gas and electricity system could be different
- Is the time right to consider the system providing results in energy?
- Are the gas industry clear about the benefits a gas Smart Metering System may offer?

Is there a need for standards?

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- Traditionally the gas industry is slow to change, however we are now seeing a step change in technological requirements
  - The majority of existing gas meters use well established technologies allowing products to be made to a standard
- Could the process of developing standards help by:
  - Clarifying what the gas industry require
  - Getting all stakeholders around a table
  - Providing the basis for ensuring interoperability between the dataflow and Supplier
- Benefits of developing standards:
  - Reduce the amount of duplication
  - Increase clarity
  - Ultimately save costs?

How could standards help?

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- This simple slide illustrates the key areas for standardization
- Meter, communication, and a back office…improved customer information...ability to update tariffs……

Areas of interest

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- The meter is subject to a CEN Technical Committee, (CEN/TC 237) which I chair
- Communication system is under a CENELEC Technical Committee
- The back office system require industry protocols to be developed to ensure interoperability and smooth switching
- What is new is that stakeholders from the metering sector and the Communications and Systems sectors need to work more closely…

What is happening now/next steps

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- Marcogaz have a Working Group working to influence stakeholders
  - Including the Commission, CEN...
- CEN/TC 237 have a Task Group under its Working Group 5 to produce a CEN Technical Report
- Communications standards developed by CENELEC are available but may need to be understood
- The Commission are considering issuing a Mandate to the European Standards Bodies (CEN, CENELEC and ETSI) to produce standards for Smart Meters
- Utility Industries - Gas, Electricity, Water and Heat need to discuss protocols to determine if a common approach can be reached

Conclusions

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- There could be conflicts between the MID and ESCO Directives however they should be seen as complementary:
  - MID metrology, ESCO improve end-use energy efficiency
- Functionality could be different between gas and electricity Smart Metering
- The gas industry needs clarity on how to gain the benefits from a Smart Metering System
- The process of standardization of the Smart Metering System will focus the minds of all stakeholders
- A Smart Metering System does not necessarily have to be complicated
- The requirement for energy information at the meter needs further consideration

Presentation concluded

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- Thank you for your attention