26 August 2010

Contribution of SYNERGRID to the ERGEG Public Consultation on Draft Guidelines of Good practice on Regulatory Aspects of Smart Metering for Electricity and Gas (E10-RMF-23-03)

General comments

- Technology maturity – need for standards

  The technology of smart meters is not yet mature, especially with respect to the communication part. Synergrid therefore recommends ERGEG to support the development of effective standards and to enforce the production of such "standardized" smart meters. These are crucial not only to reduce costs and improve the business case of large scale smart meter projects, but also in view of integrating smart meters in a smart grid perspective.

  The production of "standardized" Smart Meters should make the implementation of 80% in 2020 possible.

- Customer benefits & openness for market segmentation

  At this stage, it is not yet clear whether all customers will be able to benefit from the smart meter technology and its associated services. Some studies (a.o. the EU-DEEP project) demonstrated that the cost-benefit analysis was not positive for customers having a consumption capacity lower than 100 kVA. Others argue that a massive roll-out will directly or indirectly benefit to all end-users (e.g. via the link between smart meters and smart grids).

  Hence, given the current uncertainties and the potential impact on their business strategy, some Belgian DSO's want to keep the possibility to adopt a different approach (with respect to the smart meter technology, the related services and the roll-out strategy) for different market segments (e.g. SME's, households, prosumers,...).

- Other

  To reach the 80% target, Synergrid recommends that ERGEG enforces the accessibility to the meter installation by making enough space available for the meter installation.

  Synergrid also recommends to ERGEG to find solutions for:
  - The privacy issues
  - The different tariff rates

  The installation of smart meters must be able to support future proof solutions, this to guarantee in the future the effectiveness of investments made today. The development of standards should also support this future proof functionality.

Comments on the introduction

The decision for a roll-out of intelligent metering systems in Member States should be based on an assessment of all the effects of this roll-out. One part of such an assessment could be a cost benefit analysis. Synergrid believes that, even if the cost benefit analysis is based on an extensive value chain including consumers, network operators, producers, suppliers, metering agents, etc, the roll-out of Smart Meters will imply very large investments mainly for DSO's.

Given the cost of a massive roll-out, the installed smart meters should be "future proof" with a hardware lifetime of at least 15 years.
Additional functionalities should be implemented by software upgrades.
These software upgrades should be a reliable, secure and stable process, demanding a state of the art technology in the Smart Meters system.

If the C/B analysis is negative for the DSO, a mechanism should be put in place (in principle via the distribution tariffs) allowing the DSO to be remunerated for the difference between his costs and his benefits.

Comments on part 2 – Customer services - electricity

Recommendation 1. Information on actual consumption, on a monthly basis

DSO's should certainly give information on consumption. As far as costs are concerned, some Belgian DSO's oppose to that functionality, whereas others are willing to offer it. In the latter case, DSO's should only be responsible for the transmission, to the customers, of the costs calculated by the suppliers, not for the calculation itself.

This information could be given via web portal or other communication networks, not necessarily via in-house display. The display should not be given for free even if the information is available at no cost for the customer (via web portal).

Remark : if 80% of the E-Meters have to be installed before 2020 with a life span of 15 years, the technology must be **very shortly available** on the market. However most of the concepts and technologies are not yet stable and solid enough (especially for 15-minutes meter readings)

Recommendation 2. Accurate metering data to relevant market actors when switching supplier or moving

Synergrid supports this functionality and feels that remote reading should definitely be a minimum requirement for the new meters to be installed; it is cost efficient, accurate and environmentally friendly.

Synergrid strongly recommends that there should be only one entity responsible for the reading and for managing the access of third parties to the metering data.

The authorized third parties should receive access to the data stored in the central database, but should not be allowed to have directly access to the meter itself.

Recommendation 3. Bills based on actual consumption

Synergrid considers that customers should receive accurate bills, including information on their actual consumption. However, the payment could remain equally spread over the year, with a yearly correction (like today), in order to avoid strong fluctuations, especially seasonal variations of the invoiced amounts (e.g. due to heating in the winter) and therefore to avoid the emergence of new bad payers.

Defective meters and fall-out of the data communication connections can be the cause of data loss and subsequently of (small indeed) estimations.

These incidents should be kept minimal by:

- Solid meters with a small fall-out (<1%) which keep minimally 1 month consumptions in memory.
- Fail save data communication system.

Recommendation 4. Offers reflecting actual consumption patterns

4. a) Question to stakeholders:

When interval metering is applied, which interval should be used for customers and those that both generate and consume electricity? Please specify timeframes and explain.
Answer :

- Meter intervals of 15 minutes make sense if one opts for an identical value for all customers, because this is in line with many market processes in Belgium (forecasting, settlement, balancing, peak consumption);
- Nevertheless, some DSO's are willing to keep open the possibility to use other time intervals for different customer segments (see above – general comments);

Remark:
In a first phase, interval metering and settlements could be offered as an optional chargeable service to the customers. In the long run, providing interval metering data to all customers will be beneficial for the understanding, transparency and functioning of the market with increasing access to real time information.

4. b) Question to stakeholders:
When Time-of-use (ToU) registers are applied for customers and those that both generate and consume electricity, what would be an appropriate number of registers? (Comment: In this case, registers are equivalent to prices)
Answer:

- The increasing number of local (individual) production units will change drastically the consumption patterns. This means that the price levels and also the periods of high and low consumption will change. Flexibility in the register choice and consequently flexibility of the Smart Meters should keep all possibilities open. Anyhow an adjustment of the M.I.D. is necessary.

Remark
Time of Use (ToU) registers needs to be clearly defined. At present times, in the countries where it is in force, ToU interval metering is not very narrow, since Time of Use tariff is mainly based on time (night/day, winter/summer season etc..)
In the future ToU could be based on actual demand/supply (short term price signals) rather than time.
ToU should be used by the DSO as well to avoid potentially local congestion due to the roll-out of electrical vehicles for instance.

Recommendation 5. Power capacity reduction/increase

100A is the upper limit of the current that can be managed (reduced/increased) by DSO's at reasonable cost. For currents above 100A, additional systems are required.

In order to deliver this service (only possible for electricity) the following conditions have to be fulfilled:

a) **Reliable communication** in order to be able to execute the commands ; the timeframe within which the command should be executed shall be determined by the competent local authority
b) **E-meters:** switching system with life span of 15 years (maximum switching numbers)
c) In accordance with national legislation of public service obligation

Additional remarks:
- Synergrid thinks that in the future, demand-side management mechanisms will be essential to enhance Europe's energy efficiency. Remotely adapting the connection capacity of the customers is only one way to reach this objective. Other possibilities exist, such as incentivizing consumers to shift their energy consumption at off-peak times. Smart meters could also play a role in this view, provided they are integrated into a Smart Home Network.
- A distinction between load management for end-user energy efficiency purposes and load management for enhanced operation of the grid has to be made. In case of DSM, the electrical appliances should be automatically restarted.

Recommendation 6. Activation and de-activation of supply

Synergrid agrees on the remote activation and de-activation of supply. This should be part of the minimum requirements of the smart meters as it strongly supports operational efficiency.

The following conditions should be fulfilled:

E-meter:

1. **Reliable** communication for executing the command ; the timeframe within which the command should be executed shall be determined by the competent local authority
2. Switching system with lifetime of 15 years (maximum numbers of switchings)
3. Compliant with safety legislation
4. Compliant with legislation of public service obligation

G-meter:

1. **Reliable** communication for executing the command ; the timeframe within which the command should be executed shall be determined by the competent local authority
2. Switching system with lifetime of 15 years (maximum numbers of switchings)
3. Lifetime of the battery of 15 years for both communication and switching device.
4. Compliant with security legislation
5. Compliant with public service obligation

As far as 'activation' is concerned, the operation should be done in two steps: 1) the grid operator sends remotely a signal that unlocks the meter; 2) the customer is now allowed to really activate the supply. This second action is necessary a.o. for security reasons.
The meter should send an acknowledgment confirming the action is achieved.

Recommendation 7. Only one meter for those that both generate and consume electricity

Synergrid agrees that one bi-directional meter is sufficient also for those customers who produce electricity as modern meters can register both injected and consumed energy. Since the meter should be part of the DSO network, specifications on the functionalities of the meter should always be approved by the DSO. Standardisation of meters and metering could solve this issue from both DSO and customer perspective.

Remarks:

- Usually 4Q-meter is described including reactive, capacitive or inductive energy. Are these measurements necessary for LV-customers?
- This doubles the number of registers of the Smart Meters.

- There is also the possibility to measure and communicate the gross production of the local productions through the Smart Meter network.
- Attention should be paid to the period (monthly ?, yearly?) of compensation mechanism (injection / consumption).

Recommendation 8. Access on customer demand to information on consumption data

Synergrid considers that one should distinguish between the direct access to **basic data** – extracted from the meter, that should be provided free of charge - and access to **advanced data checked and constructed** by the DSO. The latter information can be provided, but not necessarily free-of-charge (it depends on the business strategy of each DSO).

The DSO should be responsible for supplying consumption data to the customer via a standard interface, e.g. web portal.

Recommendation 9. Alert in case of non-notified interruption

Synergrid supports this recommendation, but it must be considered that this service should be subject to technical feasibility. In other words, the DSO should make its best efforts to provide the information about interruption to the right customer, but should not be liable towards customers if the procedure does not reach its goal (no obligation of results).

An "immediate" receipt of information about grid errors asks for real time communication, which is not yet ready.
Errors on the distribution grid can be passed on through the Smart Meters communication platform to the Outage Management System (OMS).

NB: in parts of Belgium, the DSO has to put an emergency generator if the incident lasts more than 6 hours.

Recommendation 10. Alert in case of high energy consumption

There is already a limitation via the capacity limit (recommendation 5).

Offering an 'alert service' when there is a sudden increase of the consumption over long periods of time (hours) could be envisaged, BUT one should pay great attention to the following issues:
- this service could cause privacy problems;
- the DSO has no information regarding the modifications performed by the customer and which can have an impact on his consumption pattern (new appliances,…);
- such a system could lead to numerous false alarms, annoying for the customer and for the network operator.
- DSO's are not liable for information about supplier
costs

Regarding information on costs : see comments on Recommendation 1.

Recommendation 11. Interface with the home

A standardization in this area is absolutely necessary. The Smart Meter cannot support all interfaces. There is only one gate, and therefore one interface. M441 should give a definite answer. Working with price signals has to be standardized. The alternative would be to transmit the tariff signals via another telecommunication network (i.o. the smart metering communication system).

Recommendation 12. Information on voltage quality

Synergrid does not fully support this optional recommendation, since the Smart Meter cannot be considered an instrument fully compliant to IEC 61000-4-30.

The Smart meter can detect Voltage quality characteristics such as Voltage interruption or voltage variation, according to EN50160 but cannot be considered as a tool to measure the compliance to IEC 61000-4-30.

In case of good real time communication a wave form of current or voltage can be forwarded for analysis.

Recommendation 13. Information on continuity of supply

Synergrid supports this optional recommendation.

NB: some DSO's have already default logging systems based on the connectivity between the consumer and the LV-MV- networks. The added value of the SM is less important for them.

Other services for improving the awareness or becoming active actors in Smart Grid could be:

- Forward load diagram
- Forward load diagram analysis
- Simulations with local productions
- Forward local productions results + need of cleaning solar cells
- Individual RUE (Rational Use of Energy) measures

The possibility to offer such services, and the way such services would be offered to end-users, should be left open to local DSO's / local authorities.

Comments on part 3 – Costs and benefits - electricity

Recommendation 14. When making a cost benefit analysis, an extensive value chain should be used

Synergrid supports this recommendation. Cost-Benefits Analyses which would only focus on the benefits of Smart meters for DSOs, ignoring benefits for suppliers, customers and society as a whole should not be conducted.

Even if the cost benefit analysis is based on an extensive value chain including consumers, network operators, generators, suppliers, metering agents, etc, the roll-out of Smart Meters will imply very large investments, especially for the DSO's.

If the C/B analysis is negative for the DSO, a mechanism should be put in place (in principle via the distribution tariffs) allowing the DSO to be remunerated for the difference between his costs and his benefits.

Remarks on F: one should not propagate the idea that the Smart meter can offer a protection against electrical risks to the customers. Only informed users will be able to understand properly the possible consequences of a voltage deviation.

Synergrid would like to add that there are also expected benefits for the suppliers, such as:

- better forecasting;
- more services – preservation of customers,

- …

Synergrid is in favour of a transparent communication of the costs and benefits to the consumers. This communication should be done by the local competent authorities.

Comments on part 4 – Roll-out - electricity

Recommendation 15. All customers should benefit from smart metering

See the general comments above.

Synergrid supports this recommendation, provided at least that:
- the assessment is globally positive,
- if the C/B analysis is negative for the DSO, a mechanism is put in place (in principle via the distribution tariffs) allowing the DSO to be remunerated for the difference between his costs and his benefits
- It is proven that customers are sufficiently aware and ready to "play the game"

Some Belgian DSO's also consider that Member States or Regions should be allowed to choose different solutions for different segments of the market (see general comment).

Recommendation 16. No discrimination when rolling out smart meters

Synergrid supports this recommendation.

Remark: In some particular cases (e.g. isolated farms), and subject to the agreement of the local authorities, DSO's should be allowed to apply specific conditions for the installation of smart meters. These special situations should be handled based on transparent and non discriminatory criteria, formerly approved by the local competent authorities.

General remarks on the chapters 5, 6 and 7

Whereas electricity meters measure the consumption in energy (kWh), with the result is given instantaneously, gas meters are indicating the gas volume passing through it at measuring condition (m^3). The consumption in energy (kWh) is calculated in the office based on the caloric value (mean value of the caloric value measured upstream in the network), the gas temperature and the gas pressure. The yearly bill is given in energy units.
Currently there is no gas meter where the measurement result is given in energy and the use of equipment like a caloric value determination device at each residential metering point is currently not feasible for economic and safety reasons.
Synergrid proposes to clarify in the document that the consumption of gas is measured in volume (m^3).

Comments on part 5 – Customer services - gas

General comment
When reading the paragraph concerning the MID, we have the impression that ERGEG considers the MID as insufficient and that this directive should be changed to allow smart meters.

At our knowledge, additional functions are allowed by the 2004/22/EC directive (MID) but they shall not influence the metrological characteristics of the measuring instrument.
Additional functions under national law shall not constitute a barrier to trade by restricting the free movement of goods or technical innovation. The outcome of the mandate M/441 should solve this issue.
Having a "*display of the total quantity supplied or the displays from which the total quantity supplied can be derived, whole or partial reference to which is the basis for payment*" on the instrument covered by the MID, is a fundamental right and a basic protection of the customer. This is the bases for transparency. Since the MID allows additional indications, this could not be a barrier for the development and implementation of smart metering.

However, we can not understand the importance given to the "measurement of the pressure compensation". The influence of pressure variations on a low pressure network for the measurement of the domestic consumption is negligible. When the replacement of all meter in the field is required, temperature conversion could be considered. In this case, an economic approach, such as the retrofit of existing meters with communication modules can not be applied.

Recommendation 17. Information on actual consumption, on a monthly basis

Synergrid agrees on the monthly communication of volume (m^3) of gas to the consumer.
The communication of the bill on a monthly basis is not possible on a short basis for gas consumption since the higher heating value (HHV) is not available in such a short period.

Remark : The obligation for the DSO to visit and check the gas connection on a regular basis will remain in force, regardless of the type of meter installed (smart or not smart meter). This obligation has an impact on the business case for gas smart meters.

The measurement of pressure compensation is really ambitious and (too) far reaching.

Remark : For gas meters, it should be clearly stipulated which consumption unit is taken into consideration:

- m^3, or
- kilowatt-hour. Then the calorific value should be known by the meter. Sending these data to the meter would have a serious impact on the system.

Recommendation 18. Accurate metering data to relevant market actors when switching supplier or moving

Synergrid supports this functionality and feels that remote reading should definitely be a minimum requirement for the new meters to be installed; it is cost efficient, accurate and environmentally friendly.

Synergrid strongly recommends that there should be only one entity responsible for the reading and for managing the access to metering data.

Also here the access to a database containing the interval metered values is sufficient for third parties. They should not have a direct access to the meter itself.

Recommendation 19. Bills based on actual consumption

The choice should be left to the consumer and/or to the local authorities. Anyway, the consumer receives an accurate bill at the end of the settlement period.

Flexibility should be considered to avoid big fluctuations in the invoiced amounts due to the seasonal variations of the gas consumption (e.g. due to heating in the winter). The payment could remain equally spread over a year, with a yearly correction, in order to help the consumer to manage his budget.

The temperature and the pressure should be measured at the level of the meter to make a good estimation.

Defective meters and fall out of the data communication connections can be the cause of data loss and subsequently of (small indeed) estimations.
These incidents should be kept minimal by:

- Solid meters with a small fall-out (<1%) which keep minimally 1 month consumptions in memory.
- Fail save data communication system.

Recommendation 20. Offers reflecting actual consumption patterns

This functionality is applicable for electricity where the cost of generation varies hourly, but has *a priori* more limited practical sense for gas, at least for the residential market where gas networks store huge amounts of energy and therefore react slowly over time to changes in demand.

20. a) Question to stakeholders:

When interval metering is applied, which interval should be used for customers? Please specify and explain.
Answer :

- Belgian DSO's have different views on this question : some DSO's think that hour values are required, whereas other DSO's consider that monthly values are sufficient

20. b) Question to stakeholders:

When Time-of-use (ToU) registers are applied for customers, what would be an appropriate number of registers? (Comment: In this case, registers are equivalent to prices)

Answer : Time-of-use (ToU) registers are not relevant for gas.

One should keep in mind that the answers to questions 20.a and 20.b has consequences on the cost-benefit analysis (e.g. lifetime of batteries vs. frequency of communications), on the accuracy of the bills (in energy units), on the allocation process…

Recommendation 21. Access on customer demand to information on consumption data

On demand, the customer should be able to access information on his/her up to date consumption data. Member States should consider whether this could be subject to a fee.

Feedback of consumption data could be given through different channels (DSO to choose in agreement with the local competent authority):

- Letter, email or bill

- WEB-portal: very appropriate by the younger generations
- Digital TV set: very suitable to reach the total population (= existing display unit)
- PC: 50% of the customers
- Display unit

Recommendation 22. Hourly flow capacity reduction/increase

Once again, there are important differences between gas en electricity.

As gas appliances tend to provide for basic needs (central heating, water heating and cooking), there is more limited scope to reduce energy consumption because any reduction depends on the installed appliance's efficiency and the level of insulation in the home. There are many factors for which the consumer has no short term influence (external environment such as a long cold winter, damp atmosphere…) – at least the residential consumer and small service businesses..

Furthermore, as most of gas systems react slowly to changes in operation, the consumer may not see instantaneous changes to the operations of their appliances, whereas the immediate response of electrical appliances would provide instantaneous information that could help the customer to rationalise their electricity consumption..

One should also point out that a gas meter can only operate in an "open" or "closed" position. Otherwise the gas pressure cannot be kept stable. The capacity can only be reduced by closing the meter after a defined consumption. The problem of the life span of the gas meter's battery for the power supply of electronic data communication mechanism and for the power supply of the motors for steering the valves is not yet resolved. Also the safety procedure when "opening" should be defined.

Recommendation 23. Activation and de-activation of supply

Adding two way secured communication system and a valve to the gas smart meter, allows remote shut-off and prepayment facilities. For security reasons the valve may not be opened remotely without a safety feature. The valve may not be remotely opened since there is significant risk to an uncontrolled release of gas.
The valve opening function must therefore either:

a) incorporate a check for an uncontrolled release of gas which if present leads to the automatic re-closure of the valve; or
b) require the presence of a person who enables the valve to open and is instructed to prevent an uncontrolled escape of gas; or
c) both a) and b).

The example you gave requires compete gas shut off guaranteeing gas tightness. According national safety rules in some European countries like Belgium, a sealing the service line is required in this case.
The actual used battery powered valve does not allow a smart meter valve to be regarded as an isolation valve.

See also the answer to recommendation 22.

Recommendation 24. Alert in case of high energy consumption

New algorithms would have to be developed to offer this functionality.

Note that sudden high increases in consumption are not common for gas appliances well maintained.

Smart meters can locally be equipped with excess flow detection and a valve that closes automatically when a high flow (e.g. due to a big leakage) is detected. But in that case :

- the detection level will be higher than the maximum flow rate for which the meter is designed to allow his verification (e.g. > 7,2 m^3/h for a domestic gas meter G4)
- this functionality might give a false safety feeling to the consumer since it does not prevent uncontrolled escape of gas;
- this functionality is not an alternative for correct maintenance of the customers gas installation.

Recommendation 25. Interface with the home

Given the fact that the information of the gas meters is sent to the communication module of the E-meter, the gateway can also be connected to the E-meter.

One technical feasible system to help the end user managing their gas consumption is to provide an output from the gas meter which represents the measured gas volume (m^3). This output can be used by a 'home display unit'. This 'home display unit'; preferably common for gas, electricity, water, heat… consumption, can calculate and display the necessary data to manage the home consumption, for instance load profiles, comparisons of consumptions… and could even provide adaptive control to manage the energy consumption (e.g. to bring the heating on at the correct time or switch it off when no one is home). It is easily feasible to provide this 'home display unit' with a communication system (e.g. by internet) to provide the end user with more useful information.

The pulse output of a residential gas meter is already harmonized in Europe. The most recent residential meters are sometimes provided with a pulse output but a lot of the meters on the market would have to be changed.

Consideration shall be given to the electrical safety and the fact that a lot of residential gas meters are installed outside. It should be noted that the output connector of the meter is not yet harmonized in Europe. In order to obtain the interoperability, this connector will have to be harmonized.

Comments on part 6 – Cost benefit analysis - gas

Recommendation 26. When making a cost benefit analysis, an extensive value chain should be used

Synergrid supports this recommendation. Cost-Benefits Analyses which would only focus on the benefits of Smart meters for DSOs, ignoring benefits for suppliers, customers and society as a whole should not be conducted.

Even if the cost benefit analysis is based on an extensive value chain including consumers, network operators, generators, suppliers, metering agents, etc, the roll-out of Smart Meters will imply very large investments, especially for the DSO's.

If the C/B analysis is negative for the DSO, a mechanism should be put in place (in principle via the distribution tariffs) allowing the DSO to be remunerated for the difference between his costs and his benefits.

Remark on O : this benefit is quite theoretical and hard to put in practice, because most gas networks are meshed and one should also account for line-pack capacity.

See also answer to recommendation 14.

Comments on part 7 – Roll-out of smart meters - gas

Recommendation 27. All customers should benefit from smart metering

See the general comments above.

Synergrid supports this recommendation, provided at least that:

- the assessment is globally positive,
- if the C/B analysis is negative for the DSO, a mechanism is put in place (in principle via the distribution tariffs) allowing the DSO to be remunerated for the difference between his costs and his benefits;
- It is proven that customers are sufficiently aware and ready to "play the game"

Some Belgian DSO's also consider that Member States or Regions should be allowed to choose different solutions for different segments of the market (see general comments)

Recommendation 28. No discrimination when rolling out smart meters

See answer to recommendation 16.

Comments on part 8 – Data security and integrity – electricity and gas

Recommendation 29. Customer control of metering data

The DSO, as regulated and trusted company, should have access to the necessary technical data needed to operate its networks without having to ask the customer's approval for this. The DSO should guarantee the data security and integrity.

Synergrid agrees the customer should be allowed to decide freely which measured data can be transferred to which (authorized) third party, for commercial purposes.
However for the network operator it is always necessary to have access to sufficient measuring data **without the agreement** of the customer. The legislation for protecting the privacy should be respected.