

SmartRegions



European Smart Metering Landscape Report

SmartRegions Deliverable 2.1
www.smartregions.net



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Vienna, February 2011

meters and install AMR modules for 245,000 water meters during the next years. The meter is owned by Enemalta corporation, the national electric company. In 2010 Enemalta launched an on-line portal allowing to access the customer consumption details.

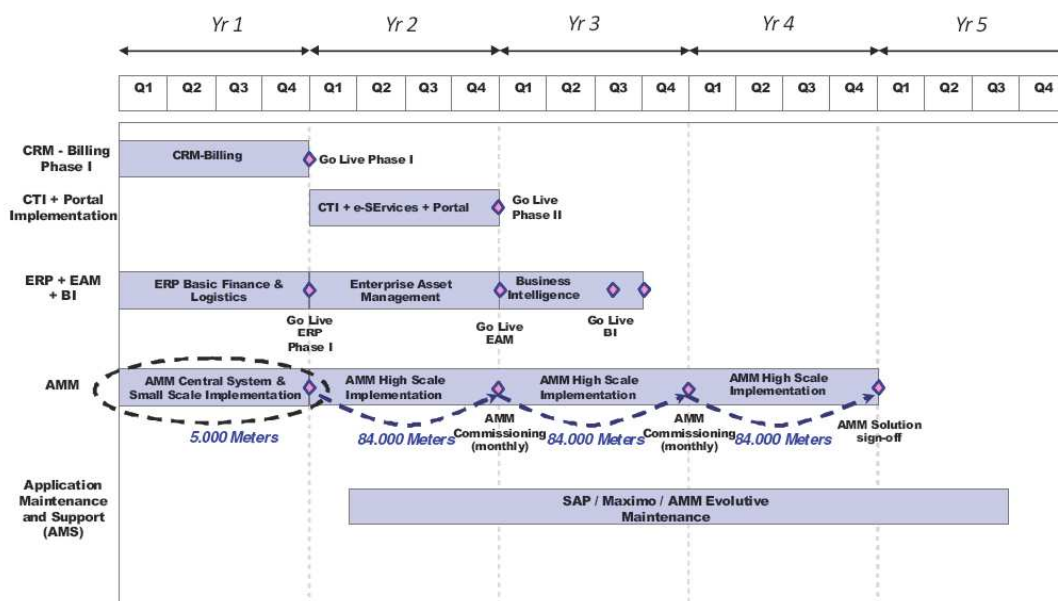


Figure 4: Timetable of Integrated Utilities Business System (IUBS) in Malta (Klatovsky, 2010)

While the installation of electronic meters is moving according to plan, there were some serious problems with electricity bills that were issued by Automated Revenue Management Services, Ltd (ARMS). Instead of receiving electricity bills of their actual consumption, many customers still receive estimated bills or no bills at all. In November 2010, the government of Malta has approved an investigation into alleged mismanaged handling of water and electricity bills by ARMS Ltd. Minister for Transport, Communications and Infrastructure, Austin Gatt, explained in parliament that software, and not employee bungling, was the reason behind the billing problems. Out of 889,117 bills which the company issued, 47,841 were incorrectly billed, which translates into a failure rate of 5.3 percent.²³

3.19 Netherlands

The Netherlands is one of the front runners in smart metering in Europe. On 9 November 2010 the Dutch House of Parliament passed a revised bill that sets the legal framework for a voluntary rollout of smart meters.

The electricity and gas markets in the Netherlands were deregulated in a number of phases: first the large - mostly industrial - customers, followed by the middle segment and the market for green electricity and finally, from 1 July 2004, the market for *all* low-volume users. An

²³ An overview is provided by following Sources: <http://www.smartmeters.com/the-news/1381-malta-investigates-power-billing.html>; <http://www.maltatoday.com.mt/news/arms/smart-meter-clients-still-receiving-enemalta-estimates>; <http://f1plus.timesofmalta.com/articles/view/20101110/local/mugliett-slams-government-on-arms-ltd>

independent regulatory authority appointed by the government – in the Netherlands the Office of Energy Regulation (part of the *NMa*) – supervises the entire energy market.

3.19.1 Policy objectives for the introduction of smart metering

The restructuring of the Dutch meter market for small energy users and rollout of smart meters is an important part of a broader new market model for households and small business users. Important national drivers for the reform of the Dutch meter market were a strong desire to correct administrative problems with billing that followed the liberalization of the Dutch energy market in 2004. Other goals were to facilitate more energy market competition (easy switch for consumer), improve operational efficiency for market parties and -last but not least- the stimulation of energy savings for end-use customers.

Except for the ‘national’ drivers, the legal rollout proposal was also designed to meet the requirements of the Energy End-use and Energy Services directive (2006/32/EC). The Dutch government interpreted Article 13 as a claim for smart meters and bi-monthly bills.

Important drivers in other countries, such as limiting customer peak load demand to reduce the size of maximum demands in capacity e.g. on hot summer days, are less important drivers for smart metering in The Netherlands. The Dutch tariff system is primarily based on fixed rates. The only available tariff scheme that could be considered as a basic and static form of demand response is the option to choose for a meter that allows a fixed switch between two tariffs: day- and night/weekend tariffs. It is expected that the roll out of smart metering will stimulate the introduction of prepayment and flexible tariff schemes.

Prior to the original proposed changes in the Electricity Act and the Gas Act, which included a mandated rollout of the smart meter, a thorough cost-benefit analysis was conducted in 2005. This cost-benefit analysis, performed by KEMA by order of SenterNovem (now Agentschap NL), resulted in an expected positive business case of approx. 1.3 billion euro (SenterNovem, 2005).

Because the mandated introduction of the smart meter was not approved by the Dutch Senate and the original proposal had to be changed to allow a voluntary rollout of the smart meter, a new cost benefit analysis was required to calculate the financial implications on a national level. The Ministry of Economic Affairs has therefore instructed KEMA to perform a revised cost-benefit analysis to gain insight into the consequences of the changed circumstances with respect to the business case for the introduction of smart meters in the Netherlands (Gerwen et al., 2010). The three major differences that urged a new analysis were:

1. the smart **meter will only be read once every two months** in the standard situation. Only if express and unequivocal permission has been obtained from the consumer can a detailed reading be taken. In the 2005 analysis detailed reading was still the standard situation.
2. The consumer will have the **option of refusing the smart meter**. This means that the consumer in question will keep his or her traditional meter. In the case of new construction and renovations it *does* become compulsory to install a smart meter, and there is no obligation to replace it with a traditional meter at the request of the consumer. In this case the consumer can have the smart meter treated like a traditional meter by registering it as ‘administrative off’.

3. The need to get an understanding of the possible measures the Dutch government could take to influence the **social costs and benefits** into the direction desired by the Dutch government.

Referring to a situation of almost 100% acceptance of the smart meter as well as almost 100% standard readings, the updated cost-benefit-analysis concluded there is a positive business case of app. 770 million euro. The main beneficial items (in order of positive contribution) are energy savings, savings on call centre costs, a lower cost level as a result of the market mechanism (increased switching) and savings in meter reading costs.

3.19.2 Legal foundation of smart metering services

In 2008, the Dutch government presented a legislative proposal to bring the smart meter under the responsibility of network operators in the regulated domain in combination with a mandated rollout to all households. Following consultations in the market sector, the Ministry proposed the following meter market changes:

- All small users will be given a smart meter;
- The grid operators will be responsible for rollout. The grid operators will own and maintain the smart meter and be responsible for a total distribution;
- The meters will become part of the regulated domain of the grid operator, being considered as part of the physical infrastructure;
- The cost of the hardware (meter hire) will be regulated;
- The energy retailers will be responsible for all customer related processes and the management of the metering data;
- The smart meters must comply with the basic functionality and technology mentioned in the smart meter industry standard NTA-8130 and DSMR.

To meet the obligation arising from the ESD to provide regular feedback to consumers about energy consumption, the government stated a preference for setting a minimum frequency of 6 times per year (every two months).

The government considered a mandated rollout as prerequisite, because it was expected that in a liberalised market, without further regulation, a smart metering roll out would probably reach no more than about 30% penetration. In that case, several of the smart meter benefits mentioned above would not be realised.

The rollout will partly be funded from the current meter tariff. This tariff should remain unchanged or even drop. To date the meter charge has not been regulated and has increased by up to 100% since 2001. The Dutch Competition Authority has stated that it could not believe there is a relation between the increased tariffs and actual costs.

In 2009, after three terms of intense debate and influenced by vigorous campaigning of the national consumer's organisation *Consumentenbond* and privacy watchdog groups, the Dutch senate (First Chamber) declined to approve the mandated roll out of smart meters. To solve the privacy issue in the Netherlands, the smart metering bill was reintroduced in September 2010, based on a voluntary rollout of smart meters and passed by the Dutch House of Parliament on 9 November 2010. The Senate will discuss the revised proposal probably in

January next year. General expectations are now that the Senate will also approve the revised bill and give permission to start a two year pilot-phase in order to gather and evaluate rollout experiences in 2011 and 2012. Based on this evaluation, a decision will be taken on the final rollout up to 2020.

The future legal and regulatory framework for the introduction of the smart meter in the Netherlands will therefore be based on a **voluntary rollout of smart meters** among all households. The actual legal framework does not allow for enforcement measures for the acceptance of the smart meter. The role of the government is to focus on stimulation, information and persuasion of smart meter acceptance. Areas for attention with respect to policy targets are the *acceptance* of the smart meter, the *effective use* of the smart meter and an *efficient rollout* of the smart meter.

In the meantime, a meter standard was defined for the residential meter market by the Netherlands Standardization Institute. This meter definition, with the registration number NTA 8130, defines a **minimal set of basic functions** for connecting the consumer to the energy distribution infrastructure in the Netherlands. The minimum functional requirements required in the smart meter include:

- Remote reading of the energy consumption (both periodic, actual and interval values);
- Remote reading of the electricity supply (both periodic, actual and interval values) – meant for individual (decentralized) generation;
- Monitoring of the quality of the electricity supply (outages, voltage swells and sags);
- Registration of violation and fraud attempts;
- Remote activation and deactivation of the energy supply;
- Temporarily limit the electricity supply by setting a threshold;
- The possibility to connect external services devices;
- Sending short messages to the display of the meter;
- Sending long messages to the meter for on-line interaction – these will be forwarded to the external devices;
- Status information (errors, tariff indicators, breaker and valve positions, thresholds);
- The possibility of firmware updates; and
- The provision of access and security.

3.19.3 Chronological overview of the development of smart meter legislation in the Netherlands.

The Dutch government already started thinking about smart meters since the liberalisation of the domestic energy market in 2004. The electricity and gas markets are now fully liberalised in the Netherlands. Water and heat are in practice not liberalised. The regulator for electricity and gas is DTE.

In February 2006, the Dutch minister of Economic Affairs submitted a 'policy intention' to the Lower House, addressing the restructuring of the meter market for small energy users. This as a part of a new (meter) market model for households and small business users (defined

as having an electricity connection less than 3 x 80 A and gas usage less than 170,000 m³ per annum). Important drivers for the reform of the Dutch meter market were a strong desire to correct administrative problems with billing that followed the liberalization of the Dutch energy market. Other goals were to facilitate more energy market competition (easy switch for consumer), improve operational efficiency for market parties and –last but not least- the stimulation of energy savings for end-use customers. Also, in a liberalised market, without further regulation, a smart metering roll out would probably reach no more than about 30% penetration. In the case of a partial penetration, several of the smart meter benefits mentioned above would not be realised. Therefore, a 100% rollout was considered to be a pre-requisite.

Except for the ‘national’ drivers, the legal rollout proposal was also designed to meet the requirements of the Energy End-use and Energy Services directive (2006/32/EC). Because Article 13 in the ESD does not make an explicit link to smart meters, there is substantial variation in the interpretation of Article 13. While for some member states the existing meters in combination with an annual bill can fulfil the requirements of the ESD, the Dutch government interpreted the paragraph as a claim for smart meters and bi-monthly bills.

Important drivers in other countries, such as limiting customer peak load demand to reduce the size of maximum demands in capacity e.g. on hot summer days, are less important for smart metering in The Netherlands.

In April 2007 a meter standard was defined for the residential meter market by the Netherlands Standardization Institute. This meter definition, with the registration number NTA 8130, defines a minimal set of basic functions for connecting the consumer to the energy distribution infrastructure in the Netherlands. The minimum functionality required in the smart meter includes:

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- Registration of violation and fraud attempts;
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- The possibility to connect external services devices;
- Sending short messages to the display of the meter;
- Sending long messages to the meter for on-line interaction – these will be forwarded to the external devices;
- Status information (errors, tariff indicators, breaker and valve positions, thresholds);
- The possibility of firmware updates; and
- The provision of access and security.

The Netherlands Standardization Institute also ruled that meter technology will not be dictated, but rather there must be a functional basic level on the basis of which grid operators are able to perform their public tasks and for which commercial parties can develop services. In this respect, other important key aspects of the smart meter are interoperability and compatibility between systems.

In 2008, a legislative proposal to bring the smart meter under the responsibility of network operators in the regulated domain in combination with a mandated rollout to all households, was discussed in the House of Representatives. Following consultations in the sector, the Ministry proposed the following meter market changes:

- All small users will be given a smart meter;
- The grid operators will be responsible for rollout. The grid operators will own and maintain the smart meter and be responsible for a total distribution. The supplier/ energy retailer will be given some initial influence on rollout prioritization;
- The meters will become part of the regulated domain of the grid operator, being considered as part of the physical infrastructure;
- The cost of the hardware (meter hire) will be regulated;
- The energy retailers will be responsible for all customer related processes and the management of the metering data;
- The smart meters must comply with the basic functionality and technology mentioned in the smart meter industry standard "NTA-8130 and DSMR.
- The intention to meet the obligation arising from the ESD to provide regular feedback to consumers about energy consumption, has led to a preference for setting a minimum frequency of 6 times per year (every two months).

The rollout of smart meters will partly be funded from the current meter tariff. This tariff should remain unchanged or even drop. To date the meter charge has not been regulated and has increased by up to 100% since 2001. The Dutch Competition Authority has stated that it could not believe there is a relation between the increased tariffs and actual costs. These costs will now become regulated, while the data collection costs, which will be set by the supplier, will be unregulated.

Although the House questioned the smartness and possible privacy implications of the proposed smart meter, the mandated rollout was reluctantly adopted by the House of Representatives on 3 July 2008. Especially the Netherlands' main consumer organisation Consumentenbond opposed the new law, mainly because of privacy concerns. Moreover, the Consumentenbond questions the energy saving claims of the smart meter.

To obtain approval from the House, the Minister of Economic Affairs agreed to facilitate the following extra functions regarding the smart meter (Samson six, named after Labour member of parliament Diederik Samsom):

1. More possibilities for own energy generating;
2. A user friendly direct display for in home use;
3. An alarm for unexpected peak usage;

4. Real time measuring and use versus own generating of energy;
5. Possibilities for remote programming of appliances such as laundry machine or dryer;
6. Possibilities for communication with other meters.

Other points of agreement between the Minister of Economic Affairs and Parliament are:

1. The introduction of a standard bill for consumers;
2. Higher volume (5000 kWh instead of 3000 kWh) for own generation of electricity;
3. Timely billing by grid operators.

Regarding the **privacy concerns**, the Ministry of Economic Affairs also promised to ensure that privacy-sensitive 15-minute and 60-minute measurement data will only be used for specific purposes and only for which the customer has given its consent. Additional regulation will set out what measurement data these parties need in order to provide the customer with the desired services. Important is the distinction between the minimum level of consumption data required in all cases in order to bill the customer for the quantity of energy supplied (for example the two-monthly meter readings in kWh and m³) and consumption data at a lower aggregate level (for example weekly meter readings in kWh and Wh). When entering into a supply agreement, the customer will be obliged to authorise the supplier to use the minimum requisite level of consumption data. Small consumers have to explicitly give their consent before commercial use can be made of any other measurement data and data beyond the minimum regulated level (for example, actual output). The customer therefore determines in all cases in advance, which measurement data generated by the smart meter is to be used by which party. To be able to access the measurement data to be provided by the grid operator as standard, the grid operator has set up authorisation and authentication procedures. These procedures must ensure that individual measurement data is only used for the specific purposes for which the customer has given its consent.

Last but not least, the Minister of Economic Affairs agreed that the introduction of smart metering will take place in two phases: a two year 'try-out' phase en an 'acceleration' phase after evaluating the qualities of the present smart meters being used so far. During the try-out-phase, the roll out of smart meters would only be compulsory in new construction, renovations and large-scale redevelopment projects. However, after this period, the introduction of smart electricity and gas meters in virtually all households would become mandatory in the subsequent period (likely to be a period of six years).

On April 7th 2009 and after three terms of intense debate and influenced by vigorous campaigning of the national consumer's organisation Consumentenbond and privacy watchdog groups, the Dutch senate (First Chamber) declined to approve the mandated roll out of smart meters. Most crucial in the debate was the publication of a report by university of Tilburg researchers, commissioned by the Netherlands' main consumer organisation, to look into the privacy aspects of the smart meters. The report indicated serious privacy issues related to hourly and 15-minutes readings. This information could give away sensitive information about the consumer's habits (i.e. when someone leaves the house or returns). Second, the smart meter could provide insights into a family's living patterns and relationships "which can affect people's freedom to do as they please in the confines of their homes". Third, there is a

risk that information about a person's energy use will fall into the hands of third parties such as the police or insurance companies. As a consequence, a mandated roll out of the smart meter is being considered a violation of the right to privacy as guaranteed by Article 8 of the European Convention on Human Rights. Finally the Dutch Senate considered the mandatory nature of the rollout unacceptable: refusing a smart meter would be considered an 'economic offence', punishable with a fine up to 17,000 euros or six months in prison.

To solve the privacy issue In the Netherlands, the smart metering bill is reintroduced in 2010, containing a compromise (voluntary) version and offering four legal options for a consumer in accepting a smart meter (see details below). This compromise proposal was accepted by the Dutch Parliament on 9 November 2010. Expectation is that the start of the two year trial/pilot will start in the beginning of 2011. After that there will be an evaluation which (could) start(s) the roll out in 6 years.

3.19.4 Smart Metering Landscape in the Netherlands

Following a controversial public debate on the introduction of smart metering in The Netherlands, on 9 November 2010 the Dutch House of Parliament passed a revised bill that is based on a voluntary rollout of smart meters. Following the acceptance of the Senate, which is expected in January 2011, a two year pilot-phase will be started in order to gather and evaluate rollout experiences in 2011 and 2012. Based on this evaluation, a decision will be taken on the final rollout up to 2020.

Considered to be a responsibility of market parties, the provision of metering services is not part of the Dutch regulatory framework. However, within the settlement of the functionality of a 'standard smart meter' under the supervision of the Dutch Standardization Institute (NEN), dedicated functionalities to support metering services have been included in the so-called 'Dutch Technical Agreement' in this area (NTA 8130), which later was expanded with the so-called Dutch Smart Meter Requirements (DSMR) under the control of the Dutch Independent Grid Management Company.

These minimum specifications and requirements for all gas and electricity smart meters should allow grid operators to perform their public tasks and commercial parties to develop smart metering services. In this respect, other important key aspects of the smart meter are interoperability and compatibility between systems.

The current state of smart metering services in The Netherlands is also closely related to the **four legal options for a consumer in accepting a smart meter:**

1. The option to refuse the installation of a smart meter and keep the 'traditional' meter;
2. The option to have a smart meter fitted (or once it has been installed), but opt out of sending your meter readings automatically (smart meter functions as a traditional meter, a meter reader is still required);
3. The option to have a smart meter fitted, but with a limited set of automatic meter reading capabilities of which the most important are: final billing in case of switching energy supplier or remove to a new house, once a year for annual billing and bi-monthly meter readings for interim energy advice.

4. The option to have a smart meter fitted, with full automatic smart meter reading. This is (of course) the preferred option for the government and energy market players.

The consumer's opportunities for saving energy depend on the meter choices mentioned above. It is important that even with a meter that is turned to 'administrative off' additional services via the P-1 port and the installation of a display are still possible. The starting point is that a standard reading also provides standard indirect feedback. With detailed meter readings additional services are possible, such as time-based tariffs (detailed time of use tariffs, ToU), variable price contracts (real-time pricing, RTP) and demand management (demand side management, DSM). The starting point is that direct feedback must always be via the P1-port.

In short, the acceptance level of the smart meter is relevant for achieving a positive Dutch business case in which the effects of energy saving services are considered to be the most important benefits.

3.20 Norway

In the Norwegian deregulated power system, the final customers are free to choose their power retailer. This means that the customers have separate tariffs for the electrical energy and the use of the power network. The design of the network tariff is strictly governed by the monopoly regulation and the energy contract is based on a contract between the power retailer and the customers. Self-reading of the meter has been the most common solution for smaller customers. Despite the lack of technology for Automatic Meter Reading (AMR) in the second quarter of 2010 55% of household customers had an energy contract related to the market price (NVE, 2010b).

3.20.1 Policy objectives for the introduction of smart metering

From the Norwegian Regulator's point of view, Smart Metering technology is evaluated as an enabler for a more efficient power market, a more optional consumption of electricity and good management of the power systems. Only Smart Metering technology regarding electricity is evaluated in Norway.

The Regulator has specified the following objectives for the implementation of Smart Metering technology (NVE, 2010a):

- Exact billing of the electricity consumption
- Easier to change power supplier
- Increased competition between the power retailers, and thereby reduced prices and new products/services
- More efficient control of the distribution system
- Increased information to the customers regarding prices and their electricity consumption.