

Description of integrated pilots/demonstrations/field tests/existing practices

*Innovative metering systems*¹

Situation in Austria

"Electricity metering is the responsibility of system operators. The E-Control Commission sets maximum charges for metering services which depend on the type of device used. About 5.3m of the 5.5m electricity meters in place in Austria are domestic electromechanical single or multi-tariff devices which are read manually by system operators' staff — mostly on an annual basis, but in some cases only every three years. There are some 120,000 maximum demand meters, mostly installed at small and medium-sized businesses, and farms, which are also generally read manually. There are also about 30,000 load profile meters used by large consumers and generators (consumption of over 100,000 kWh/50 kW). These are remotely read; the data is transmitted via GSM networks or telephone lines."

Some 600,000 meters form part of customer installations with interruptible load and/or switchable tariff (day/night) periods centrally managed by system operators via ripple control systems.

E-Control plans to take further action to promote the introduction of innovative metering systems in Austria, taking the consultation submissions received from market participants into account.

Pilot projects in Austria

Three Austrian system operators are currently planning to replace electromechanical meters by electronic meter management systems. The following arguments are cited as the main motives or the changeover:

- Obsolete meters and/or ripple control infrastructure;
- Cost reductions from process automation;
- Preparing for future developments including:
 - Energy efficiency programmes;
 - Supply reliability and power quality monitoring; and
 - Providing additional services.

¹ Green Electricity in Austria, Report by Energie-Control GmbH

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1. Name of the case

Innovative metering systems

a) Energie AG

Low volume trials throughout 2007, being expanded to 10,000 meters from Autumn 2008.

b) LINZ AG STROM

Program to install 75,000 Echelon Networked Energy Services meters, with an option for a further 75,000

c) Stadtwerke Feldkirch (Municipal Utility Feldkirch)

Echelon is installing 3000 of Utilitis Solution for municipal electricity network.

2. What is integrated with DSM

- | | |
|-------------------------|-------------------------------------|
| DG | <input type="checkbox"/> |
| Energy storage | <input type="checkbox"/> |
| Smart grid technologies | <input checked="" type="checkbox"/> |

3. What is the level of commercialization

- | | |
|-------------------|-------------------------------------|
| Research project | <input type="checkbox"/> |
| Demonstration | <input type="checkbox"/> |
| Field test | <input checked="" type="checkbox"/> |
| Existing practice | <input checked="" type="checkbox"/> |

4. Where to find more information?

E-Control: Metering

http://www.e-control.at/portal/page/portal/ECONTROL_HOME/STROM/FACHTHEMEN/MESSWESEN

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- a) Energie AG
 - Contact person
 - web-site
http://www.energieagdata.at/eaqat/page/339536794271614883_339536794271614882~339536824067950500~437878110708943636_437878110708943636.de.html
 - references
 - Günter Rosenauer "Implementation of AMIS at Energie AG Oberösterreich", Präsentation Metering Billing/CRM Europe 2007, Wien
 - Anderas Abart, Elektronische Zähler als flächendeckende Indikatoren des Spannungsbands in Ortsnetzen, 2nd International Symposium on Distributed Generation and Smart Grids.
- b) Linz AG
 - Contact person
 - web-site
http://www.linzag.at/navigation/section.id,1497,nodeid,1497._country,strom._language,de.html
 - references
 - DI Karl Rossegger „AMR and IEM as a market led business case”, Presentation IQPC 2007, Amsterdam
- c) Municipal Utility Feldkirch
 - Contact person
Dipl.-Ing. Hans-Jörg Mathis
 - web-site
http://www.feldkirch.at/stadtwerke/aktuell/Fernablesung_Artikel/show
 - references
 - DI Mathis, Presentation "Automatic Meter Reading Lessons learned from the first large scale AMR implementation", Stadtwerke Feldkirch, Presentation Smart Metering Central and Eastern Europe 2007, Budapest

5. Objectives of the case

- Automation of the metering process: reading, barring, change of tariff;
- Reduction of the costs per customer and meter;
- Improvement of the data quality: meter accuracy, frequency of reading;
- Acquisition of voltage quality at the customer;
- Exchange of the unidirectional ripple control;
- Tariffs and customer processes like telecom: customer-tailored; simple exact on day based "free of charge" change of tariff
- CRM automated customer process:
- automation of transformer stations
- auxiliary services: interfacing to other sources, home automation

The necessary exchange of the meters is justified by the requirements of the end-user energy efficiency guide line of the EU and the increased quality of customer service.

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6. Business rationale/model

Impacts on the market system:

The use of synthetic load profiles is an interim solution only for the customers who have changed their electricity supplier. The quality of the incumbents, which concentrate their supply of the former ruled area (market liberalization - unbundling) is in fact bad.

The load profiles are the base for the suppliers who are new to the market. The profiles serve for prognosis and acquisition of the provided amount of energy.

With the increased introduction of "smart meters" in Austria, the measurement of the load profiles would create a base for updated profiles with a high degree of quality and agreement to the real profiles (as a permanent solution to all market members).

The transmission from synthetic to real analytical load profiles (based on daily demand) could be fulfilled with the wide-area introduction of "smart meters". In the best case, all prognoses, acquisition and billing processes could be conducted by real measured load profiles.

This would mitigate the risk of the balance energy between the different "balance groups", which is a significant barrier to foreign contractors to get involved in the Austrian electricity market.

Determination of energy consumption and access to the amount of used electricity

Activation, deactivation and change of the supplies require determination of the exact amount of used electricity. In the most cases the amount is calculated and not read from the meter.

Almost every time a energy or system tariff changes, the customer's billing is done based on calculated based on his estimated demand. This is often the reason for complaints of customers, which make a correction of the bill necessary.

7. Technologies used

- a) Integration test with a few refitted transformer stations (radio communication or fiberglass connection) is held in Gmunden (Upper Austria) with 1.000 meters.. The full integrated system (SAP IS-U) is based on the AMIS-Technology² of Siemens.
- b) Linz AG has started a pilot project in the "energy park Plesching" with several hundred meters of AMM³. The company Ubitronix is the technical partner, producer of the Echelon meter technology.

² Siemens AMIS – Advanced Metering Information System (www.siemens.com)

³ DI Karl Rossegger „AMR and IEM as a market led business case“, Presentation IQPC 2007, Amsterdam

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- c) The municipal utility Feldkirch have decided to start together with Sitronics (technology partner of the meter manufacturer Echelon) a project to implement "smart meters" in their ruled area (2003). The used Echelon-meters have been certified for use in Austria in 2006.

8. Short description of the case

- a) The biggest project of "smart meter" introduction is carried out by Energie AG. It is planned to substitute 85% of all meters until the year 2015.
The first phase of the project starts with the installation of 10.000 "smart meters" in autumn 2008 in selected regions in Upper Austria (Regau). The start of the large-area rollout with 100.000 every year is planned for the October 2009.
- b) Linz AG actually holds 350.000 meters in her area, whereof about 15.000 are older than 35 years. This project is one of the energy savings measurements, which have been initiated by Linz AG in the last years.
- c) In the ruled area of municipal utility Feldkirch exist 17.000 meters. About 9.500 (about 65%) meters have to be exchanged or calibrated in the next 5 years.
In the summer of 2003 a project to evaluate a new extended billing system has been started. In December 2006 the pilot project has ended and the field test started.
Whenever a meter has to be exchanged or recalibrated, a new meter is been installed. More than 1500 meters have been installed so far.

9. Achieved/expected results (operational savings, CO₂, efficiency enhancement)

*Regulatory experiences in Austria*⁴

Currently, all household customers in Austria are equipped with standard electromechanical meters (app. 5.3 Mio), which are in general read once a year. App. 600.000 customers have an interruptible supply for electric heating or hot water, managed via a ripple control receiver. App.30.000 large industrial or commercial consumers (> 100.000 kWh and > 50 kW) are equipped with remotely read interval meter (AMR) systems. Metering services are by default delivered by the grid operator, who charges a regulated meter tariff to all customers.

In 2006, the Austrian Regulatory Authority for the Electricity and Gas Market (E-Control) launched an information campaign (conference, website, discussions) to raise awareness in smart meter technologies and its role in energy markets.

In April 2007, E-Control issued a public consultation paper on the introduction of smart meters in Austrian households. The regulator is in general in favour of smart metering as long as certain minimal functional requirements and data access for third parties are met. In addition, AMR/AMM systems have been identified as one of the energy efficiency measures listed in the upcoming energy efficiency law (national transformation of EU Directive 2006/32/EC) in Austria.

⁴ Smart Metering with a Focus on Electricity Regulation, ANNEX 2 – A2.1, Ref: E07-RMF-04-03, Oct. 2007, www.ergeg.org

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10. Lessons learnt

Consultation paper on innovative metering systems in Austria

In April 2007 E-Control posted a consultation paper entitled *Einführung innovativer Messsysteme in Österreich* (Introduction of Innovative Metering Systems in Austria) on its website (www.e-control.at). All market participants are entitled to make consultation submissions up to 15 June 2007.

E-Control welcomes the use of innovative metering systems in principle, and takes the view that the nationwide installation of such systems is already economically viable under current operating conditions (metering charges). In order to ensure that all market participants enjoy the benefits of these systems, E-Control recommends imposing the following minimum specification:

- Load profile recording;
- Bidirectional data communication;
- Multi-tariff functionality;
- Import and export metering;
- Power quality monitoring;
- Recording of supply interruptions;
- Centrally controllable maximum demand control and supply interruption;
- Display unit on the meter;
- Communication interface with an external display;
- Communication interface for the acquisition of data from external metering devices (e.g. gas, water or district heating).

In addition, metering data should be made accessible to authorised market participants at all times.