

# Advanced Metering Management Case Study

**ACEA**

Italy



Advanced Metering Management solution – critical success factors in a utility environment

Acea, the second largest electricity distributor in Italy, partnered with Ericsson to roll out one of the world's largest Advanced Metering Management (AMM) solutions, incorporating some 1.5 million customers.

## The Acea success story to date

Governments around the world are mandating that utilities roll out meter reading solutions as part of a broader social strategy. Although the principal governmental agenda is to better manage environmental impacts, for utilities there are extremely compelling business and operational benefits to be realized for deploying automated metering. Acea has realized these benefits.

Acea provides electricity to more than 1.5 million customers through the management of transmission and distribution grids in Rome. In 2004 it embarked on a demanding project to roll out an Advanced Meter and Network Management solution, in order to collect, manage and integrate sensitive metering and network operation data into the company's business processing systems.

Today it has a sophisticated automatic meter reading solution, already operating on more than 1 million electricity meters, enabling it to:

**Protect its revenues** and better account for energy flows, through:

- Preventing and managing frauds
- More accurate and timely billing
- Better management of bad payers.



**Lower its operational expenses** in data and customer management and network maintenance and operation, as well as deliver a much higher level of customer service through:

- Remote activation/deactivation of supply and elimination of manual meter reading
- Improved knowledge of network operation particularly for the low voltage network, exploiting the meters as remote control terminals, giving detailed information about loads, voltages, technical losses and interruptions
- Improved service quality given less and shorter interruptions, due to the immediate notification to the Acea Network Operations Center of faults in the medium and low voltage network, avoiding penalty payments to the regulator, due to better monitoring and control.

**Achieve operational efficiencies** through:

- Improved management of the low voltage and medium voltage electricity network, providing fault detection and blackout prevention
- Automatic LV network mapping
- Load balancing of meters and transformers
- Monitoring of substations (fire, floods, unauthorized access)
- Improved planning for network reinforcements and developments.

**Improve service to customers** by:

- Invoicing based on actual consumption levels
- Accurate and 'in-time' billing, enabling the client to easily check consumption



- Customized tariffs ('happy hours') and prepaid options
- Shorter power breaks due to the immediate notification to the Network Operations Center of faults in the low voltage network
- Faster reaction times to supply deficiencies and anticipating complaints by meter self diagnostics and automatic detection of breaker trippings in substations
- Optional 'In Home' display terminals (a handy table top device that plugs into a mains socket), providing:
  - Communication regarding billing and payments
  - Detailed metering information, such as consumption profiles
  - Advance notification of programmed interruptions
  - Buzzer and blinker alarm when the subscribed power is being exceeded, to prevent disconnection
  - Information on whether an interruption belongs to the supply network or to the user installation
  - Remote control of the delivery circuit breaker on outdoor meters (optional meter model).

Given the need to ensure highly skilled and durable support for the system over a very long time span (at least 15 years), Acea decided to investigate partnership possibilities. The following considerations were taken into account:

- Skilled personnel
- New developments and technology advancement
- Cost effectiveness
- Knowledge management especially given the long life expectancy of the system
- Control over future developments of the system and its evolution to other metering applications, such as water and gas

- New unregulated revenue opportunities leveraging the 'metering service business', and as a result commercialization and marketing of the solution. Acea contacted several major providers of information processing services and decided to partner with Ericsson.

Leveraging Ericsson's expert Systems Integration and program management prime integrator capability, combined with the Ericsson Utility Resource Manager (URM), the solution features:

- A complete metering data center solution
- Extensive support to network operations
- Machine-to-machine communication network for meter management
- Interface to customer care services including contact center, internet portal, and help desk.

Furthermore, Acea signed a 10 year Managed Services agreement with Ericsson for the metering data center and the machine-to-machine communication network. As part of the agreement, Ericsson manages and develops Acea's system for Automatic Meter Reading. Households are linked via electrical power lines to concentrators which are linked via GPRS modules to the service center managed by Ericsson, where data is integrated into Acea's business systems for billing, network management and customer care.



“Ericsson is the best choice for Acea to have a strong and committed local and global partner with an excellent combination of competencies in Managed Services, mobile network and Systems Integration, assuring the solution evolution.”

Massimiliano Salvi, President of Acea Distribuzione SpA

### In summary, the established partnership with Ericsson gives Acea the following business benefits:

- Revenue protection by more accurate billing and early detection of power fraud
- Lower opex in customer management and network maintenance
- Increased customer satisfaction and service levels
- Best possible protection of the investment
- Optimal system management in comparison with a self-made solution
- Ability to focus on core business
- Minimum conditioning of the company organization dynamics
- Risk reduction through partnering with Ericsson – the industry's Managed Services leader and the world's largest telecommunication services organization.

## Reflecting on Acea's success: key lessons learnt

Deploying an AMM solution of this size has provided enormous insights for both Acea and Ericsson, which can now be applied to other AMM projects.

There were a number of critical issues that directly impacted on the success of the Acea AMM project. These included:

- A comprehensive analysis of expected achievable future benefits at both technical and commercial level
- Clearly defining the scope and design of the project and Managed Services solution
- Having a thorough understanding of the total solution lifecycle management, including operation and maintenance costs
- Ensuring there is a list of very well defined functional and performance criteria for all of the components of the AMM system, especially the communications environment
- Complexity of logistics of the rollout of meters and communication nodes could not be underestimated
- A comprehensive understanding of the requirements for the metering middleware solution (in Acea's case the Ericsson Utility Resource Manager) from an end-to-end solution perspective
- A committed local and global partner with an excellent combination of skills in Managed Services, communication technologies, System Integration and program management, assuring the solution's evolution
- Trust – a strong working partnership that features open and honest communication.



## The deployment plan

A comprehensive deployment plan, spanning from 2005 to 2009, was established. The deployment plan features:

- Clear boundaries of responsibility between Acea and Ericsson
- A well defined contract which incorporates operation, maintenance and development of the central system plus operational hours
- Effective third party contract management provisions for the installation of meters and concentrators. This is carried out by contractors, supported by agents belonging to the six territorial agencies forming the organization of field activities in Acea.

The deployment plan and program management is a critical project success factor, especially given that the total work force involved in the deployment of field equipment amounts to about 140 contracted workers, qualified for work on live electrical circuits as a single operator, and 12 equivalent full time agents, for a target of 400 000 installed meters per year.

## The system

The success of the system is strictly tied to a number of positive assessments obtained at the various stages of its development:

### **Business criteria**

Beyond the fundamental requirement issued by the Italian authority that all distributors offer competitive time of day tariffs, the development of the system has been driven by the following key considerations:

- Integrating the collection and management of metering and network data at marginal additional cost
- The investment must be supported by cost savings and additional revenues
- The reduction of industrial risk – achieved by partnering with industry leaders for field equipment (Landis+Gyr for concentrators and meters and BTicino for circuit breakers, mounting accessories and In Home terminals), to ensure effective knowledge management with a minimum of dedicated company resources.



### Strategic compliance

- Compliance to market liberalization requirements of the Italian electricity sector with no significant impact to Acea
- A highly flexible tariff programming to ensure full coverage of present and possible future requirements
- System design with an open architecture so that it will also be able to manage water and gas meters (Acea is already a large supplier of water and is considering venturing into the gas distribution business)
- The meters are provided with a PLC communication channel toward the user installation, used to manage the In Home display terminal, which can be leased, becoming a source of additional revenue, and could provide alternative access to home automation applications
- Downloading capability of software to concentrators and meters ensures improvements and adaptation of the system to future requirements.

### Key Performance Indicators

Particularly significant KPIs include:

- Effective meter accuracy of 0.5 percent on active energy (over one percent declared)
- Complete coverage of metering requirements (single phase, single phase with user remote control of circuit breaker, three phase, three phase for lifts, three phase with current transformers)

- High security against hacking and meter tampering
- Fully bidirectional meters, so that local generation can be metered without additional equipment
- Complete coverage of the LV supply types with direct and semidirect (current transformers) meters
- Complete monitoring of the supply characteristics (active and reactive energies and powers, voltages, three phase voltage imbalance, interruption logging)
- Automatic loading of meters (newly installed or shifted by a network switching from one MV transformer to another); mapping of the LV network is therefore automatically acquired (plug and play feature)
- High security of communication by data encrypting and passwords at all system levels
- Central software using standard commercial packages and Java programming
- Highly scalable central system leading to optimized solutions
- Interfacing of the central system with ancillary and other external systems, offering a neat separation so that upgrading and changes on either side do not propagate.

## About Acea

Acea, a public utility leader in Italy, is an industrial group focused on the development and valorization of two primary activities, water and energy. Listed on the stock exchange since 1999, Acea operates in the production, transmission, sales, and distribution of power, public lighting, decorative and architectural lighting and the management of integrated water services. Acea is the second largest electricity and the largest water distributor in Italy. Its consolidated 2006 net earnings were EUR 2.2 billion.

## About Ericsson

Ericsson is shaping the future of mobile and broadband internet communications through its continuous technology leadership.

Ericsson is the world's largest telecommunication services company. Our innovative and expert services strengthen our customers' competitiveness in more than 175 countries.

Ericsson worldwide is a 29 500-strong services organization.

## About Ericsson as Prime Integrator

Each year, Ericsson delivers more than 1 000 systems integration projects, in multivendor and multi technology environments, to telecommunications operators and enterprises. Ericsson's Systems Integration and consultancy expertise covers multimedia services and service network, telecommunications management solutions, IP-packet core and backbone, IP Multimedia Subsystem (IMS), satellite communications, national security and public safety solutions, utility solutions and public transport solutions.

## About Ericsson's Managed Services offering

Ericsson has the telecommunication industry's most comprehensive offering in Managed Services. As the undisputed leader in telecommunication Managed Services, Ericsson has more than 100 such contracts worldwide.



# Highlights

## Customer

- Acea, Italy

## Challenge

- To take control of operating costs and create and protect revenues

## Ericsson Solution

- Advanced Metering Management solution
- Managed Services
- Prime integrator: Systems Integration to utility business applications
- Program management

## Customer Benefits

- Revenue protection
- Reduced costs
- Increased customer satisfaction and service levels
- Operational efficiencies
- Flexibility to adapt to technology developments
- Leveraging the world's largest telecommunication services organization.

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