



## Iberdrola in Spain: smart rollout of PRIME technology

**Iberdrola in Spain is collaborating with Landis+Gyr to introduce smart metering technology to the Spanish market. PRIME-based communication technology has proven to work efficiently, and the utility is now targeting to install smart meters for all of its 10.7 million electricity customers in Spain by December 2018 as required by Spanish regulation.**

Spain was one of the first European countries to apply regulation for smart metering. The legislation<sup>\*)</sup> stated that all the new electricity meter installations had to be equipped with remote management and Time of Use capabilities from 2007 onwards. Furthermore, by the beginning of 2014, all utilities must have an AMM system implemented, and by December 2018 all 27 million electricity metering points would have to be replaced with smart meters.

Thanks to a regulatory environment defined early on, Iberdrola, and other Spanish industry players, had time to prepare for the change. Iberdrola started to assess various alternatives as early as 2007. Instead of choosing any of the existing technologies, the utility took an active role in an industry group that started to define new standards for smart metering technology – especially focusing on interoperable Power Line Carrier communication technologies.

### **PRIME – openness and interoperability for communications**

In 2007, together with a number of major technology vendors, Iberdrola initiated a R&D project around smart metering technologies. The collaborative framework was called PRIME “PowerLine Intelligent Metering Evolution”. The objective was to establish a complete set of specifications based on real field measurements and the know-how of partners with long-standing expertise in PLC technologies.

Iberdrola invited Landis+Gyr to participate in the project right from the beginning, as its global experience in smart metering and strong local presence in the Spanish market were essential for the project’s success. The partners started to work on an open, single specification and standard for CENELEC A band powerline for Smart Grid products and services. The PRIME specifications for OFDM based PLC technology, with increased data speed and communication reliability, were finalized and published in 2008.

The targets set for PRIME technology were challenging. A cost optimized solution was to be developed with open and public specifications that enable - together with the standard DLMS/COSEM protocol (IEC62056) - interoperability between the technologies of various industry players. Furthermore, high performance targets were not to be compromised. That meant that the throughput of data had to be superior in performance to existing PLC technologies.

### **IBERDROLA in brief**

Iberdrola today is the first Spanish energy group, the world leader in wind energy and one of the biggest global electricity companies. Iberdrola is a company with a solid experience forged through its 150-year history, with about 33,000 employees in more than 40 countries on four continents. In Spain, the company has 10.7 million electricity customers.

\*) ROYAL DECREE 1110/2007, ORDER ITC/3820/2007 and ORDER IET/290/2012

The PRIME Alliance was founded with eight principal members in 2009. Today, the group actively works to promote multi-vendor interoperability for markets and equipment and compatibility under the PRIME and DLMS standards – and the number of members has grown to 38, including utilities, meter manufacturers, semiconductor companies, IT companies and research institutes.

### Technology in operation

Iberdrola was the first Spanish utility to pilot PRIME PLC technology. The project in Castellón covered 100,000 metering points both in urban and rural areas. Landis+Gyr participated in the meter technology delivery with around 40,000 E450 PRIME meters.

The pilot project was completed in summer 2011. Field interoperability between multiple vendor solutions were demonstrated successfully, and the technology proved its capabilities in mass field deployment. Smart metering operations throughout the metering value



chain worked as planned, and the utility was able to start invoicing based on smart metering data. Remote disconnection and reconnection of power supply was enabled, and on-demand readings as well as remote firmware upgrades were carried out successfully in large scale field tests.

The comprehensive tests performed during the pilot project showed that the targets for PRIME technology had been met not only under laboratory conditions, but also in real field installations, and the system showed very good performance in different scenarios.

### Intelligent meter technology

The E450 PRIME smart electricity meters delivered to Iberdrola include advanced functionality to provide the utility much more than just near real time consumption figures for billing purposes. Besides consumption, energy generated can also be measured. The E450 meter enables power disconnection and connection, which supports the contract management processes within the utility and can be used to empower the gathering of billing receivables. Thresholds can also be set to disconnect the power if the preset limit is exceeded.

Registration of various power quality events support the monitoring of condition and status of Iberdrola's low voltage network. This way, long power failures and voltage variations can be reliably identified. The meter also exposes any tampering attempts; for example opening the meter cover or accessing it without permission will be registered.

The meter is designed to be ready for future technology development. It allows firmware upgrades without a need for an on-site visit. The M-Bus module enables connection of multi-energy devices in the

system later on via the electricity meter. The E450 can also be connected to In-home displays, in order to provide end consumers with access to their real-time energy consumption data.

Following the basic philosophy of PRIME, E450 meters are interoperable with PRIME data concentrators provided by 3<sup>rd</sup> party vendors. This ensures full flexibility for Iberdrola to choose their device suppliers and optimize rollout planning.

### The smart rollout continues

The transition to smart metering was regarded as the foundation for the smart grid right from the start. Iberdrola plans to take full advantage of the smart metering investment instead of simply fulfilling regulatory requirements.

Iberdrola completed the pilot in Castellón and placed a tender for another 300,000 meters in September 2011 to continue with the mass deployments. The following one million metering points were contracted in March 2012. Landis+Gyr will deliver 300,000 E450 smart meters to Iberdrola until the end of March 2013.

Step by step, the massive rollout is reaching the target of full deployment by the end of 2018. Landis+Gyr continues its long-standing partnership with the utility and commits to continuous development of its smart product range to help Iberdrola to manage energy better.

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## Building the foundation for smart grids in Spain

### Our technology

- Landis+Gyr has contracted the delivery of 300,000 E450 smart electricity meters until the end of March 2013
- OFDM based PLC communications, following PRIME specification
- Interoperability with 3<sup>rd</sup> party PRIME data concentrators
- + Iberdrola builds its smart metering investment on PRIME technology ("PowerLine Intelligent Metering Evolution").
- + Landis+Gyr has been actively participating the development of the specifications for OFDM based PLC technology to support interoperability and performance targets for smart metering.
- + Smart metering provides Iberdrola much more than on-time data on actual consumption. The utility also receives information on power quality and tampering in the network, and energy generation can be measured.