

STUDY

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PUBLIC INTERVENTION in BROADBAND MARKETS

SPAIN

Power Line Communications

*Study conducted by the research firm Cabinet Analysys
on behalf of l'Autorité de régulation des télécommunications
and Caisse des Dépôts et Consignations*



NOTICE

Autorité de régulation des télécommunications (ART) and *Caisse des Dépôts et Consignations* (CDC) have called on the firm Cabinet Analysys to conduct a study on the power line communications (PLC) in Spain.

The study will be made public in a concern for transparency and information.

The study's conclusions are the sole responsibility of the firm and do reflect in any way the opinions of ART or of CDC

Power Line Communications

Electricity utility companies like Iberdrola in Spain have promoted the development of power line communications (PLC) as an alternative broadband technology. In addition to the development of their own commercial proposition, Iberdrola has been involved in a few pilots with government organisations to test the suitability of PLC on different types of areas including rural . This section discusses the present situation of PLC technology and outlines some of the projects in which Iberdrola has worked with the private sector in Spain.

Background information

► *Strategic rationale*

Because of the ubiquity of the electricity network, PLC can potentially be used to provide broadband in rural and remote areas. However, equipment costs are currently very high, and because there are no economies of scale yet for the manufacture of this technology, the deployment in rural areas is not justified today from the economic point of view.

In others like metropolitan PLC may be competitive with other technologies like as far as it is deployed ensuring a minimum of penetration which confirms the business plan.

► *Strategic objectives*

The development of PLC technology is considered by Iberdrola as a commercial venture only.

► *Project design*

Iberdrola has worked on the development of PLC technology as a commercial enterprise independently from the government.

Description of selected solution

► *Private sector role*

This is a private sector project only.

► *Business model*

For PLC, Iberdrola is looking at a similar return on investment as for any other investment project, which is about 5–6%. The add-on functionality that PLC can bring for the automation of the electricity business (such as remote meter reading) is taken into account as a qualitative input to the business model. The equipment usually has a life of seven to eight years.

However, the technology still has to reach the desired level of maturity from the commercial point of view. The investment has to be profitable, but given the current price of the equipment the requirement stands at approximately 30 to 40 months to get a payback on the investment. Because PLC is competing against ADSL, equipment prices will need to come down to justify a massive deployment according to the business case.

► *Financial requirements*

Iberdrola has not yet decided on a mass deployment of PLC for all its controlled network. However, its commercial offer is considered one of the largest in the world (90,000 homes passed with almost 4,000 customers).

► *Economic and technical specifications*

The different companies involved in service provision are Iberdrola Distribución Eléctrica, which owns the electrical network, Iberdrola SA which owns the electronic equipment and sells the service to the end users and Neo-Sky, which provides the Internet access service.

Iberdrola also operates a fibre-optic backbone which was constructed at the time of the liberalisation of the telecoms market in Spain, five years ago. In real terms Iberdrola believes it has Spain's second largest network after that of Telefónica de España. The network's length is 10 000km with at least 48 fibres installed along core routes. The network was built along the electricity lines. In some cases, even when some portion of the electric network has been transferred to REE, the electric company has retained its telecoms network.

This network allows Iberdrola to operate as a carriers' carrier, leasing space on its towers and providing dark fibre services. The network is currently used by more than 30 operators. It interconnects with EDP's network in Portugal and LDCOM's network in France. In Madrid, Iberdrola has a contract to manage in exclusivity the metropolitan network of the Metro de Madrid for 25 years. It has a metropolitan network in Valencia as well, but it is not as extensive as that of Madrid. This gives the company good capillarity to reach PLC centrals in Madrid. The existence of the company's network is a very important asset for the PLC business model. Neo-Sky does all the commercialisation of their fibre network, with the exception of the Madrid MAN, which is done directly by Iberdrola SA.

Iberdrola's PLC offer in Madrid and Valencia consists of two products (for which it recently upgraded the speeds). 300kbit/s (formerly 100kbit/s) priced at EUR29/month; and a 1Mbit/s (formerly 600kbit/s) priced at EUR39/month. The company is currently not charging for the CPE.

Iberdrola is not offering VoIP at the moment as it does not think the quality achieved by this technology is yet the best (and it's philosophy is to endeavour to provide only best in class services).

► *Project design*

At the customer premises there has to be a PLC modem in any electricity socket. A repeater is installed in the meter room. There is a head-end in the transformation centre (this is where the electricity feeds to a group of customers which in Madrid is about 350–400 customers and there are a total of 7000 in the city with around 70 000 in all Spain (for Iberdrola only). Iberdrola then sets up a virtual broadband communications network in the medium voltage electricity cables that links several transformation centres (between 10 and 15). From there the virtual network connects to a fibre telecoms network. Iberdrola currently connects with fibre to just one of the 15 transformation centres and it works well.

This is the usual architecture for urban areas, however for rural areas, the demographics mean that a transformation centre might serve only one customer. This raises a problem of economics (and not one of technology).

► *Regulatory and legal issues*

Regulation for PLC is two-fold with both the electricity and telecoms regulators being involved. It is possible that from a telecoms perspective Iberdrola will be required to open its PLC network to others, as it could be seen as operating as a monopoly.

Iberdrola is making sure that it avoids any cross-subsidies between services and subsidiaries.

► *Role of government agencies*

Iberdrola has worked in a few projects with public sector organisations to provide services over PLC, usually for free for the first year, with a view to upgrading the customers to a paying service after the first year. Examples of these are outlined below.

- In the province of Toledo (La Puebla de Montalbán), Iberdrola is providing connectivity for 30 personal computers (PCs) in a high school connected through PLC (the backhaul is a satellite link to the transformation centre).
- In Valencia, Iberdrola has reached an agreement with the Comunidad Valenciana to demonstrate the potential of the technology by providing services temporarily paid for by Iberdrola in three cities and three rural areas.
- In Murcia, the regional government has provided funds within the framework of the Digital Cities programme (in Molina de Segura). PLC is being used to complement other technologies. Iberdrola has used PLC in the medium voltage network to reach the transformation centres, and the distribution from there to end customers has been made with WiFi.

At present there is not a sufficient level of public funds to make PLC viable in rural areas (only at a pilot level). Iberdrola's view is that enhancing the use of new technologies in rural areas should be driven by the European Commission as the only organisation capable of making a real impact with this technology.

Impacts and feedback on implementation

Iberdrola categorically confirms that the technology works well. Iberdrola has at the moment 90 000 homes passed in Madrid and Valencia. with almost 4 000 customers and phocusing on reaching the target penetration of 10%.

In contrast, Endesa, another major Spanish utility, is no longer pursuing the development of PLC because it conflicts with its interest in the telecoms business through its subsidiary Auna.