

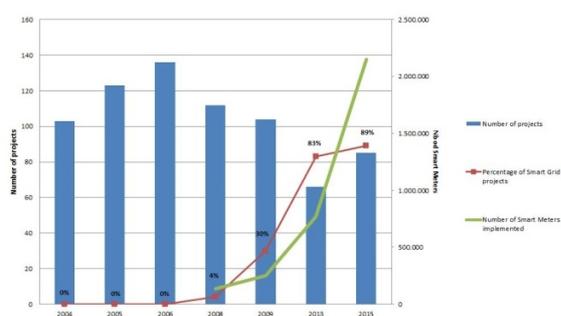
Worldwide Broadband PLC Atlas 2015

An analysis of Broadband over Powerline deployments worldwide

From a technology that was often written off, Broadband over Powerline (BPL) has come a long way as today, it is triggering renewed interest amongst operators and utilities alike. As observed from the bmp TC's worldwide analysis and research, there are **85 ongoing BPL deployments**, predominantly in the smart grid domain. While the market for BPL as an internet access technology has reduced, it still continues to be implemented in areas with no appropriate broadband infrastructure.

With better standardization regulation worldwide, BPL is finally heading towards a **co-existent**, if not interoperable **ecosystem**. For utilities, BPL provides a solution that incurs significantly **low OPEX**. It also provides **continuous connectivity** over the utility electric grid along with direct control of ICT platforms without using third party networks.

Therefore, it is no surprise that BPL is **increasingly implemented in the Smart Grid** domain. From initial pilot projects, quite some large-scale BPL implementations have been undertaken by various utilities worldwide in the recent years. Today, smart grid projects represent 89% of all BPL projects.



BPL market development per year

BPL is the favoured communication technology for utilities like Iberdola (Spain), Kahramaa (Qatar), Senelec (Senegal) etc. be it as backhaul for AMI or for monitoring of medium voltage (MV) lines. Iberdola has integrated BPL on more than **8.000 medium voltage links** as it plans to implement up to 10,3 million PRIME smart meters by 2018. Since 2008, SENELEC, Senegal has initiated the first ever MV BPL project and soon, all the MV lines in Dakar are going to be monitored with BPL. Qatar's national utility, Kahramaa has relied on BPL as backhaul on 800 MV/LV sub-stations for smart metering.

It is also widely tested for **smart metering** by various utilities. Some of the recent BPL smart metering implementations include the 5.000 meter pilot by CEZ, Czech Republic; extensive deployment of 1,8 million smart meters based on Korean BPL standards by KEPCO, South Korea etc. Utilities in Germany, Philippines & Czech Republic are also considering large-scale implementations with BPL for smart metering.

As an internet access technology, BPL helps to cover broadband exempt areas. It has been successfully employed to provide broadband up to 4 Mbps in various projects like in Serv26, France that combines fibre on MV lines and BPL on LV lines. In Ivory Coast, AWALE (a joint venture with utility CIE) has demonstrated up to **10 Mbps per user** with its pilot project on 200 households, triggering the interest of telecommunication operators.

In addition to BPL pioneers such as Ormazabal, Corinex, Defidev & Power Plus communications, **leading companies** like Alstom Grid, Huawei, Siemens, Alcatel Lucent, Billion can be now counted as BPL suppliers.

Key Features:

- More than **100 pages** analysis of BPL market, technology and suppliers
- Positioning of **15+ suppliers** for BPL
- Market **statistics from 2004 up to 2015**
- Quick assessment of the scope of worldwide, regional and national activities
- Project track down by country & suppliers
- Analysis of about ongoing and previous BPL projects in the last 5 years
- **85 detailed project descriptions** on utility/operator, location & coverage.
- Highlighted narrowband PLC/BPL projects

Highlights of the 7th Edition

- Over the decade, the market landscape of BPL has shifted it from an internet access technology to **smart grid technology**
- Within the smart grid domain, BPL is extensively deployed as **backhaul** for **Automated Metering Infrastructure** and for **monitoring** of **MV lines**
- BPL is still a reliable choice for **internet access** in broadband **under-served areas**
- **Increased interest** as major smart grid suppliers enter the BPL market
- **Market forecast** shows excellent potential for BPL in Asia, Africa, Eastern Europe & Latin America

Table of Contents

Table of Figures	4
Introductory words by Nadine Berezak-Lazarus, Managing Director, bmp TC	6
1. Brief Technology and Market Introduction	11
2. Standardization and norms overview	18
2.1. The IEEE 1901 standard and its evolution	18
2.2. Industrial norms included in the IEEE1901 standard	20
2.3. The G.hn standard and its evolution	22
3. Regulation	23
4. Suppliers' Market	27
5. Market trends and structure - and business model issues	35
5.1. Services enabled among Smart Grid	36
5.2. Broadband and Telecoms value chain and the role of the BPL utility	40
5.3. Cost and business plan	43
6. Market evolution and regional analysis	45
6.1. Asia	51
6.2. Africa / Middle East	56
6.3. Europe	58
6.4. North America	65
6.5. South America	68
7. Detailed Project overview	70
7.1. Asia	70
7.2. Africa / Middle East	77
7.3. Europe	82
7.4. North America	103
7.5. South America	105
8. BPL Integrators	106

Table of Figures

Figure 1: Current Performance of BPL	6
Figure 2: Overview of BPL projects on the African continent	8
Figure 3: BPL key areas	11
Figure 4: BPL – OFDM modulation	12
Figure 5: BPL Topology	13
Figure 6: Bandwidth and Latency performance among BPL	14
Figure 7: Operators with inhome BPL (examples)	16
Figure 8: Overview of BPL standards and norms	18
Figure 9: Overview of Homeplug norms	21
Figure 10: Overview of major core technology providers	28
Figure 11: Majors actors within the smart grid market	29
Figure 12: Overview of access Powerline integrators	31
Figure 13: Active projects per Manufacturers (2009/2013) *estimation bmp TC	32
Figure 14: Active projects by core technology (2013)	33
Figure 15: Smart Grid applications domain	37
Figure 16: BPL performances testing by CEZ	39
Figure 17 : BPL broadband value chain and utility positioning alternatives	42
Figure 18: Cost evolution and forecast	43
Figure 19: Impact of injectors, repeaters and couplers on CAPEX- a significant example	44
Figure 20: Projects applications repartition in 2013	45
Figure 21: Worldwide Home passed with BPL (2004- 2013)	46
Figure 22: Internet projects evolution Worldwide	47
Figure 23: Smart Grid projects evolution Worldwide	48
Figure 24: Repartition of Smart Grid applications (2013)	49
Figure 25: Evolution projects' number by zone (2013)	49

ORDER FORM

At a price of **1600 €** excl. VAT outside of Germany and **1904 €** incl. VAT (19%) inside Germany

Number of copies required*:

The Atlas is in English and it is delivered in a pdf format.

DELIVERY ADDRESS

Surname*:

First Name*:

Position:

Organisation/company*:

Address*:

Country*:

Tel*:

Fax:

Email*:

International VAT number:

PAYMENT

Enclosed the sum of EUR

By bank transfer – bmp TC account:

Commerzbank AG
Account 10 30 188, Bank Code 10040000
Swift Code COBADEBB
IBAN DE68 1004 0000 0103 0188 00

OR

By cheque payable to bmp TC

TO ORDER

Fax or e-mail this page to bmp TC

- By fax: +49 (0) 7621686057-9
- By email: info@bmp-tc.com

By mail: bmp TC
Schusterinsel 7
79576 Weil-am-Rhein, Germany

Do not hesitate to contact us for further information

- Web: www.bmp-tc.com
- E-mail: info@bmp-tc.com
- Phone: +49 7621 686057-0

Date, signature & stamp*

TERMS OF SALE

- 1) I agree not to make copies of the ordered document(s)
- 2) The document(s) is/are strictly for use within the concerned organization

* represents mandatory fields