E.ON Avacon

e-Home Project: A Model Smart Grid Installation based on Broadband Powerline Communications

Network operator Avacon has built a demonstration energy network that turns the vision of the future power network into a reality.

Under the e-Home Energy 2020 project a total of 32 households in the Stuhr and Weyhe municipalities were supported financially to install state of the art energy saving tools and technology. In the framework of the project, photovoltaic systems, efficient air conditioners, battery storages and electric cars were budgeted for.

Digital meters installed in each household are connected through a Broadband Powerline (BPL) communications system to local transformer stations.

Avacon receives information from the meters in real-time which means it can respond to factors such as weather conditions (which affect the availability of renewable energy).

> *"BPL has been used in Avacon's e-Home project since 2011 and has successfully delivered continuous transmission over several years."*
>
> Heiko Emmermann, Project Manager e-Home Energieprojekt 2020 Avacon AG

By providing the BPL infrastructure, Power Plus Communications (PPC) has closed the communication gap between the utility and its customers.

"Not only meter readings are transferred, the data communication platform is also used for smart grid applications. PPC has been a reliable project partner and has optimally supported us throughout the e-Home project," said Project Manager Heiko Emmermann.

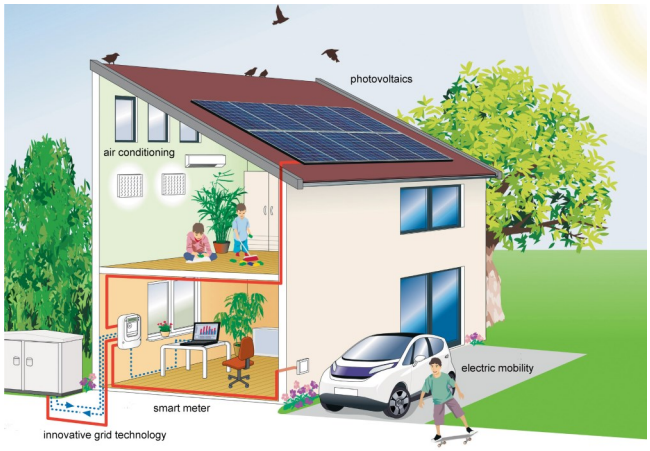

Image Source: E.ON Avacon

An energy network that turns the vision of the future power network into a reality: Stuhr & Weyhe

"Smart meters offer the greatest possible transparency to the consumers about the amount of both consumed and self-generated energy in their homes. In this way, the project realistically simulates power grids as we expect them to appear in the next ten years."

Project Summary	
Customer	E.ON Avacon
Goals	Prove the feasibility of smart homes
Solution	Connection of Smart Grid and 32 smart homes with BPL
Results	End to end data communication platform for smart grid applications

Partners in *e-Home Energy 2020* include the Stuhr and Weyhe local councils, Club Stuhr Plus, Kreissparkasse Syke, the Lower Saxony Energy Research Centre (EFZN), and the REINHAUSEN Group.

BPL as a Secure, IP–based Platform for Smart Grid Applications

The digital meters are connected by PPCs BPL system to the management head end. BPL sends meter data directly over the existing low–voltage mains.

Thanks to its high bandwidth, data transfer happens in real time, allowing the meter reading in seconds or spontaneously if necessary. Since BPL uses the TCP/IP standard protocol, it ensures maximum security for the transmitted information. Data from meters in 32 participating households were transmitted every minute.

There were a variety of different meters, which emphasises the interoperability of the BPL system: every smart home has a meter for the photovoltaic system, for the air conditioning for the entire household, for the electric vehicle charging column and also two for the storage battery.

Avacon AG, owned by E.ON and municipal shareholders, is one of the largest regional energy service providers in Germany. The distribution area of Avacon AG extends over central and eastern Lower Saxony as well as the north and centre of Saxony.

Installation of the first SunStorage SMART: Installers Tschischak von Ralf Krieten Electrical Technician, Roger Schneider, Project Manager Power Plus Communications, Jens Tiekenheinrich, Coordinator of the Avacon e–Home Energy Project (left to right).
Image: Sig Solar

Avacon has around 1,700 employees and provides ca. 16 million people with power through their networks.

Image Source: E.ON Avacon

The interdisciplinary research approach of e–home project, in which technical and economic, as well as legal and social aspects are investigated, is unique in this form in Germany and offers the chance of a comprehensive and holistic consideration of the energy transformation (*Energiewende)* in low and medium voltage networks.

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