

Comparing Customer Requirements for Smart Energy and Home Networking Applications

HomePlug Contact:

Rob Ranck, president
email: rob.ranck@homeplug.org
tel: +1.503.521.1056
mobile: +1.503.250.0614

Presentation agenda

- ❑ A brief introduction to the HomePlug alliance
- ❑ Gathering customer requirements:
Market Requirements Document (MRD) process
- ❑ New HomePlug specifications for 2010

Founded in 2000, HomePlug is the largest industry group dedicated to powerline communications networking.

Sponsor / BoD members



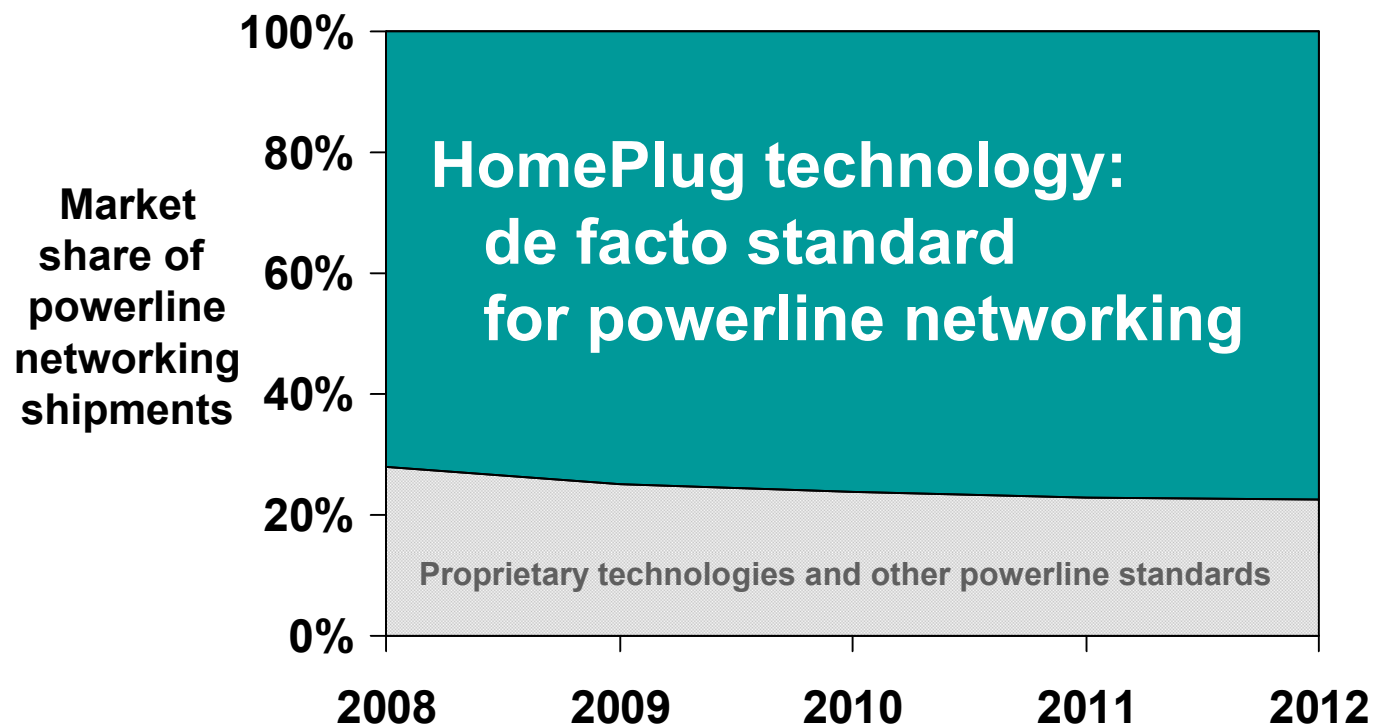
Contributor members



Complete Ecosystem Support

- 70 company members
- New members include:
 - Arris
 - Broadcom
 - Freesat
 - Hitachi
 - NEC Electronics
 - Marvell
 - Maxim
 - Electricite de France (EDF)
 - Pacific Gas & Electric (PG&E)
 - Southern California Edison
 - Reliant Energy
 - Landis+Gyr
 - Russound
 - Guillemot Corporation
 - Hangzhou H3C Technologies
 - China Gridcom Corporation
 - Jetlun

HomePlug powerline technology market share: Expected to increase to 77%



Source for market share data: *In-Stat report, Dec. 2008*

HomePlug & IEEE 1901 standard

❑ Overview of IEEE process...

- **P1901 working group formed in June 2005**
- **Feb. 2007: unified functional and technical requirements (FTR's)**
 - IH (in-home), AC (access), CX (coexistence)
 - IH and AC clusters include IPP for coexistence
- **June 2007: 12 proposals received**
- **April 2008: down selection completed to 1 proposal per FTR cluster**
- **Baseline confirmed: December 2008**
- **Draft approved in July 2009 with more than 83% majority**

❑ Next steps

- **To shorten dev time: HomePlug + Panasonic effort focused on broadest consensus possible during the baseline phase**
- **Workgroups finalizing specs for sponsor ballot in 2009**

Gathering customer requirements: Market Requirements Document (MRD) process

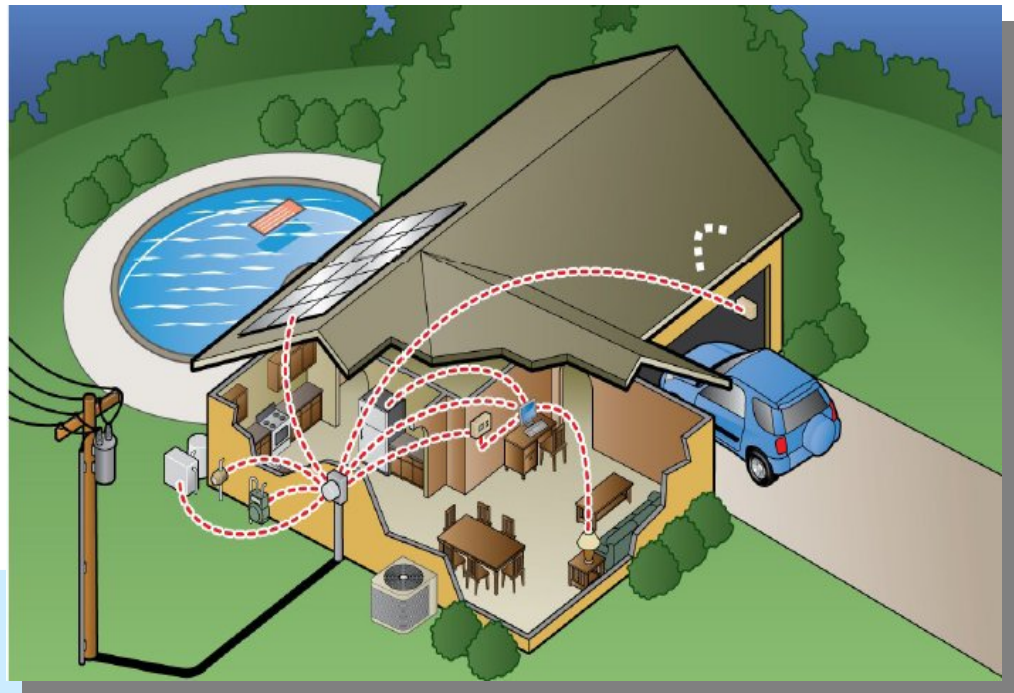
HomePlug MRD process goals

- ❑ collect requirements from all levels of the ecosystem
- ❑ ensure that technology specifications reflect realistic business requirements for real markets
- ❑ ensure that different HomePlug specifications better address the powerline roadmap for technology interoperability and coexistence.
- ❑ MRD process creates a stronger business case when specifications are subsequently submitted to SDO's (standards development organizations).
 - **Participation in SDO's is focused on engineering and architecture as opposed to business and marketing.**

Gathering requirements from throughout the ecosystem

Smart energy / Smart Grid requirements

- Utilities
- Meters
- Appliances
- HVAC controls
- Automotive
- Service providers
- Silicon vendors
- Government



Courtesy of Southern California Edison

Key documents

- **ZigBee + HomePlug Smart Energy 2.0 MRD**
- **HomePlug Smart Energy MRD**

HomePlug members: utility / energy companies



Electricite
De France



Pacific Gas
& Electric

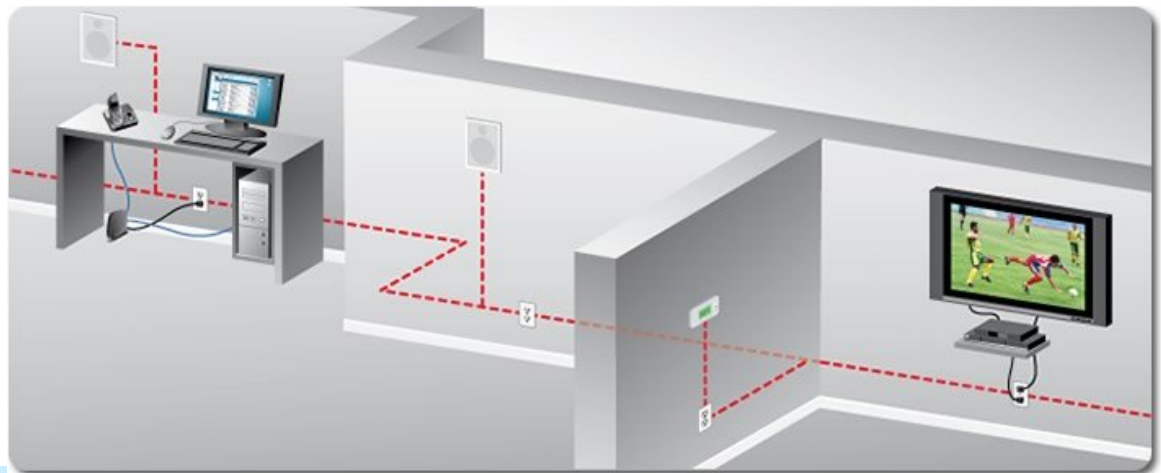


San Diego
Gas & Electric

Gathering requirements from throughout the ecosystem

HD Home Networking

- Service providers
- Consumer Electronics:
video & audio
- Set-top top boxes
- Home networking
- Silicon vendors



Key documents

- **Home Gateway Initiative
High Level Business Residential
Requirements for Rel.3**
- **HomePlug AV2 MRD**

Courtesy of Southern California Edison

New HomePlug specifications for 2010

HomePlug GP (“green PHY”) specification

❑ Principle applications

- **Monitor and control devices via low speed, low cost powerline communications:**
 - Smart Energy: demand response, load control, energy efficiency
 - Home/Building Automation

❑ Target features

- **interoperable with HomePlug AV**
- **low power consumption, low cost**
 - 75% lower cost, 75% less power consumption than HomePlug AV
- **Internet (IP) networking: 802.2, IPv6 support**
- **minimum 1 Mbps effective data rate (3.8 Mbps peak PHY rate)**
 - Support for firmware updates

❑ Target dates: Specification complete in Mar/Apr-2010; first products in early 2011

❑ Key Technical Working Group contributors

- **Arkados, Ariane Controls, Cisco, Corporate Systems, GE, Gige, Intellon, NEC Electronics, Renesas, Simply Automated, SPiDCOM, ST Microelectronics, Texas Instruments, Watteco, Yitran,**

HomePlug AV2: next generation, broadband-speed

- ❑ **Focus: support the future needs of the digital home**
 - higher speed, coverage and improved quality of experience
 - increased reliability
 - increased number of HD streams and devices
 - expanding applications such as embedded CE, Security, Medical, Energy
- ❑ **Market requirements document (MRD)**
 - Fully interoperable / backward compatible with HomePlug AV and IEEE 1901
 - Higher data rates: target based on detailed use cases = 600+ Mbps
- ❑ **Specification development underway**
 - TWG open to all HomePlug participating members
 - Collaborative process, guaranteed RAND licensing from all participants
- ❑ **Target dates: Specification complete in Q2-2010; first products in mid-2011**

THANK YOU

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