

A) General Information



Acronym:	POLSAR
Title of the User-Project:	Power Line Communications for the SmARt Grid
TA Call:	3 rd Call of Proposals,
Host Research Infrastructure:	University of Strathclyde, Institute for Energy and Environment, D-NAP Facility
Starting Date:	22/08/2011
End Date:	02/09/2011
Lead User (Name-Institution-Country):	Andrea Tonello – University of Udine - Italy
Additional Users (Name-Institution-Country):	Fabio Versolatto – University of Udine - Italy Massimo Antoniali – University of Udine - Italy

B) Summary of the User-Project

The POLSAR (POwer Line Communications for the SmARt Grid) project is a feasibility study to investigate the use of power-line communications (PLC) technology for the remote control and coordination of different devices within an electrical power network laboratory. This would allow the demonstration of PLC-enabled advanced Smart Grid applications currently being suggested by researchers world-wide, as a precursor to testing on real distribution networks with physical DERs.

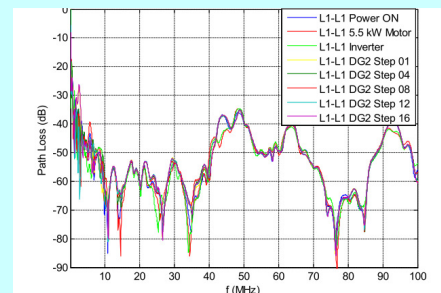
PLC channel characterization is fundamental to understanding whether PLC technology can be applied with success. Theoretical performance evaluation (rate, delay, etc.) based on-site measurement campaign and tests with PLC devices already available in the market will be performed to identify gaps, if any, of using PLC solutions in a harsh electrical environment such as in the D-NAP laboratory.

C) Main Achievements

The characterization of a power network laboratory was performed under varying conditions of loading and generation.

This work shows that it is possible to use broadband PLC communication within the laboratory environment

This work has characterized the effects that a number of generation sources and loads have on power line carrier communication, and indicates effects likely to be seen on distribution grids.



Example loss under various load conditions at Broadband PLC frequencies

D) Dissemination of the Results

The results of the tests performed in the infrastructure will be disseminated in a journal and a conference article

- IEEE Transactions Power Delivery paper – underway
- IEEE ISGT Europe 2011 – Presented Dec 2011 in Manchester, paper number 276

E) Use of the Resources

Access Days/Units (USTRATH):	10
Stay Days (USTRATH):	12

