Press release

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High efficiency to reduce the overall *dirty* energy production

Frankfurt (Oder), December 2013: The overall energy consumption and the resulting CO_2 production rose in the recent decades causing concerns related to the ecologic changes they induce. The challenge to overcome these problems became a key area of current and future research activities. The aim of the *e-balance* project is to improve the efficiency and reliability of energy systems by controlling both the energy consumption and production in smart neighbourhoods. The project started in October this year.

Energy efficiency becomes crucial for rational consumption of the available resources and reduction of the CO_2 production. But the reduction of energy consumption as the only remedy is only a partial solution that may additionally cause user reluctance. Similar, applying more environment-neutral or renewable energy sources without smart management systems may even cause failures in the energy grid or at least cause the produced energy to be wasted. Introducing intelligent solutions that combine the control of energy production and consumption helps to achieve the best efficiency at the lowest cost.

However, a successful application of such intelligent solutions faces problems due to human factors. The problem space is in fact multidimensional, but can be abstracted as a combination of social, economic and technical aspects. The *e-balance* project will investigate their interdependencies and propose a technical solution that satisfies the defined socio-economic requirements. The social, economic and technical aspects will be investigated together in order to achieve a mature and holistic solution.

The social aspects to be investigated include:

- Socio-technical development including user requirements and concerns,
- Different levels of user participation and means to increase it,
- Barriers to conduct an effective solution.

From the economic perspective the following aspects will be considered:

- Development of new business opportunities,
- Economic means to increase user participation,
- Legislation reinforcements and corrective measures.

The above mentioned aspects will render the framework for the technical solution. Additionally, the technical solution will provide the following features:

- Support for all kinds of energy source and storage,
- Scalable, fine grained and decentralized energy balancing and demand prediction,
- Security and privacy mechanisms,
- Flexible accounting mechanisms,
- Increased reliability of the energy distribution grid.

The technical solution will be based on available state of the art results and will combine and integrate them after necessary adaptation according to the socio-economic requirements. The proposed energy management platform will be evaluated in realistic scenarios using real world set-ups in Alliander's microgrid in Bronsbergen, the Netherland and in the EDP Smart Grid in Batalha, Portugal, as well as in simulation. In order to stimulate the exploitation of the results we will provide a manual (guide book) and tools for parties interested in using our solution.

These means support them in estimating the improvements they can achieve for a given deployment as well as the initial and run-time costs they can expect.

The project is coordinated by the IHP and is realised together with the following partners:

- INESC INOVAÇÃO - Instituto de Novas Tecnologias (Portugal)
- EDP Distribuição – Energia (Portugal)
- EFACEC – Engenharia e Sistemas SA (Portugal)
- Universität Málaga (Spain)
- CEMOSA - Centro de Estudios de Materiales y Control de Obra (Spain)
- Universität Twente (the Netherlands)
- Alliander N.V. (the Netherlands)
- Information Processing Institute (Poland)
- Universität Lodz (Poland)
- Lesswire AG (Germany).

For further project information:

Prof. Dr. Peter Langendörfer
Project coordinator
Tel: +49 (335) 5625-350
E-Mail: langendoerfer@ihp-microelectronics.com
Project website: http://www.e-balance-project.eu

For further IHP information:

Dipl.-Ing. Heidrun Förster
Public Relations
IHP GmbH - Innovations for High Performance Microelectronics/
Leibniz-Institut für innovative Mikroelektronik
Im Technologiepark 25
15236 Frankfurt (Oder)
Tel: +49 (335) 5625-204
Fax: +49 (335) 5625-222
Mobile: +49 (173) 2425927
E-Mail: foerster@ihp-microelectronics.com
Website: http://www.ihp-microelectronics.com

About IHP:

The IHP is a member of the Leibniz Association. It is registered as a non-profit making organization supported by the authorities of the state of Brandenburg and the federal government. 300 employees are working at the institute. The IHP pursues interdisciplinary application-oriented research in the fields of high performance microelectronics and communication, particularly Materials Research, Technology Research, Circuit Design and System Design.
The IHP performs research and development in the fields of silicon-based systems, highest-frequency integrated circuits, and technologies for wireless and broadband communication. The focus of research at the institute is oriented towards issues relevant for business, resulting in applications for telecommunications, semiconductor and automotive industries, aerospace, telemedicine, and automation technologies. The institute has developed into an internationally recognized competence center for silicon-germanium technologies.