

SMART-A

Project
Newsletter
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Smart Domestic Appliances in Sustainable Energy Systems

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The main objective of the Smart-A project is to identify and evaluate the potential synergies that arise from coordinating energy demand of domestic appliances with local sustainable energy generation and with the requirements of load management in electricity networks.

Editorial

Dear reader,

The project "Smart Domestic Appliances in Sustainable Energy Systems (Smart-A)" aims at developing strategies showing how smart domestic appliances can contribute to load management in future energy systems. In order to do this, the project assesses the options for load-shifting by a variety of appliances across Europe and compares these with the requirements from energy systems both on the supra-regional and the local level.

The project also features a detailed assessment of the **user acceptance of smart appliances** operation, and an evaluation of the usability of available control technologies and communication standards.

The **overall potential of smart appliances** is assessed based on a model which takes into account the variations of appliance use and the framework conditions in energy systems.

With this third newsletter, the project team hopes to share the project's first findings. It also includes an invitation for a **pre-conference workshop**. Please visit the project website (www.smart-a.org) for more information and the possibility to give feedback to the project team. Have an enjoyable read!

Christof Timpe

Project Coordinator, Öko-Institut e.V. (Germany)

The Smart-A project brings together the following Partners:



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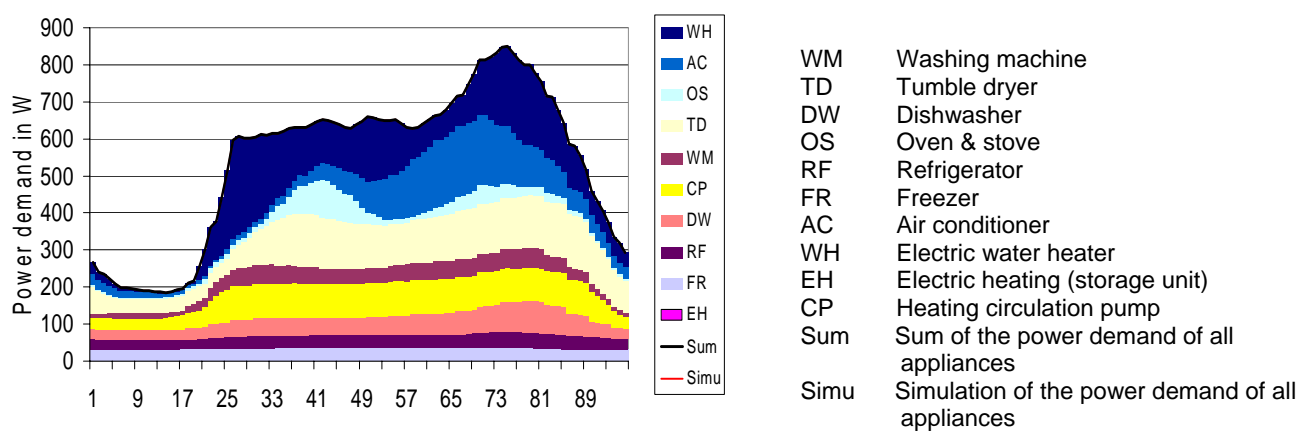
Potential of Smart Appliances

The University of Bonn analysed **the effect of the simultaneous operation of all appliances** during one day in an average European household. For this analysis, the synergy potential of each single type of appliance was identified and specified European regions were investigated for the years 2010 and 2025. The following regions were defined as representative for the different parts of Europe and were therefore included in the analysis:

- Region A: South Europe
- Region B: Scandinavia
- Region C: New Member States
- Region D: Germany/Austria
- Region E: United Kingdom

The load curve represents the energy consumption of one average European household over 24 hours for which the penetration rates for all appliances – except for electric heating – were assumed to be 100%, meaning each appliance is present and used in this home. The figure depicts the great variance in the power demand as requested by appliances, with a clear peak demand of over 800 W during the evening, followed by a drastic reduction down to 200 W during night hours.

Estimated daily load curve with a market penetration of 100% for all devices (without electric heating) in an average European household



Source: University of Bonn

Depending on the region, the actual load curve is different, as penetration of appliances and usage are different. Common in all cases is the high level of power consumption during day time, which may be seen as an opportunity to develop synergies with renewable solar energy generation. Also common is a high peak in the evening for which strategies aiming to shift the load forward into night are needed as wind energy may typically then be used.

Domestic appliances offer a wide **range of opportunities to contribute to load management** in energy systems, with an increasing part of fluctuating energy generation when being adjusted with latest technique and smart controlling options. The market penetration of such smart appliances will mainly depend on the acceptance by the consumers and therefore on the costs and benefits of smart devices in comparison to conventional ones.

Consumer Acceptance

The quantitative and qualitative consumer research - using questionnaires, interviews and focus groups, which were conducted in several European countries (Austria, Germany, Italy, Slovenia and UK) - has almost been finished. The results show a **very high acceptance level in all countries**. On average, and in all countries, up to 90% of the respondents would accept the smart operation of appliances – at least in theory.

Consumers have only a vague idea as to how smart appliances might work and have to some degree difficulties to understand the underlying technology. Subsequently, the high acceptance level and readiness to change their user behaviour in order to be able to use smart appliances has to be evaluated with a certain cautiousness.



Although consumers have a positive attitude towards the technology, there are **still many objections**. In general consumers would be ready to buy smart appliances if the technology is seen as mature and safe and if the appliances are not much more expensive than conventional ones. An important aspect for consumers is that they want to keep control over the appliances at all times and be able to override smart operation if desired.

The major driver for adopting smart appliances is the financial gain. Environmental benefits are viewed as a positive side effect, which make users feel good and indicate a green conscience. But for most people they are not sufficient and cannot be the sole reason to buy smart appliances. All in all, the economic advantage, higher security and good usability will be the key factors to increase user acceptance of the smart operation of appliances. The final report on consumer research will be soon available.

Smart-A Workshop on 9 December 2008 in Nice

The title of this Workshop is **“The Contribution of Domestic Appliances to the Integration of Renewables and DER”**. It takes place on 9 December 2008, from 14.00 – 18.00, at Palais de la Méditerranée, Nice, room “Bossanova”. More information can be found here <http://www.conference-on-integration.com/workshops.php>.

This pre-conference workshop is **the first public discussion of results from the “Smart-A” project**. Workshop participants will receive presentations on the potential synergies that arise from coordinating energy demand of domestic appliances with local sustainable energy generation and with the future requirements of load management in electricity networks. **An in-depth analysis of the options for load-shifting by a variety of appliances** across Europe and **an assessment of the user acceptance of smart appliances operation** will be presented. Based on model simulations, the potential contribution of load management by smart appliances to integrating high shares of Renewables and DER into both the electricity system and local energy systems will be demonstrated.

Participation in the workshop is **free of charge**, but **registration is required** by email to l.becker@oeko.de until 28 November 2008. More information can be found on the project website: <http://www.smart-a.org>.

The Smart-A project is in its second year.

Check on the latest updates and information by visiting our Website: www.smart-a.org