

SMART-A

Final
Project
Newsletter

Smart Domestic Appliances in Sustainable Energy Systems

December 2009



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

Editorial

Dear reader,

Our project is finished so now is the time to visit our Website (www.smart-a.org) and get all the results!

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

The project also featured a detailed assessment of the **user acceptance of smart appliances** operation.

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

With this fifth and final newsletter The Smart-A project team presents the findings on cost and benefits of smart appliance in Europe, but also our high level policy recommendations.

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The Smart-A project brings together the following Partners:



Intelligent Energy  Europe

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Costs and Benefits of Smart Appliances in Europe

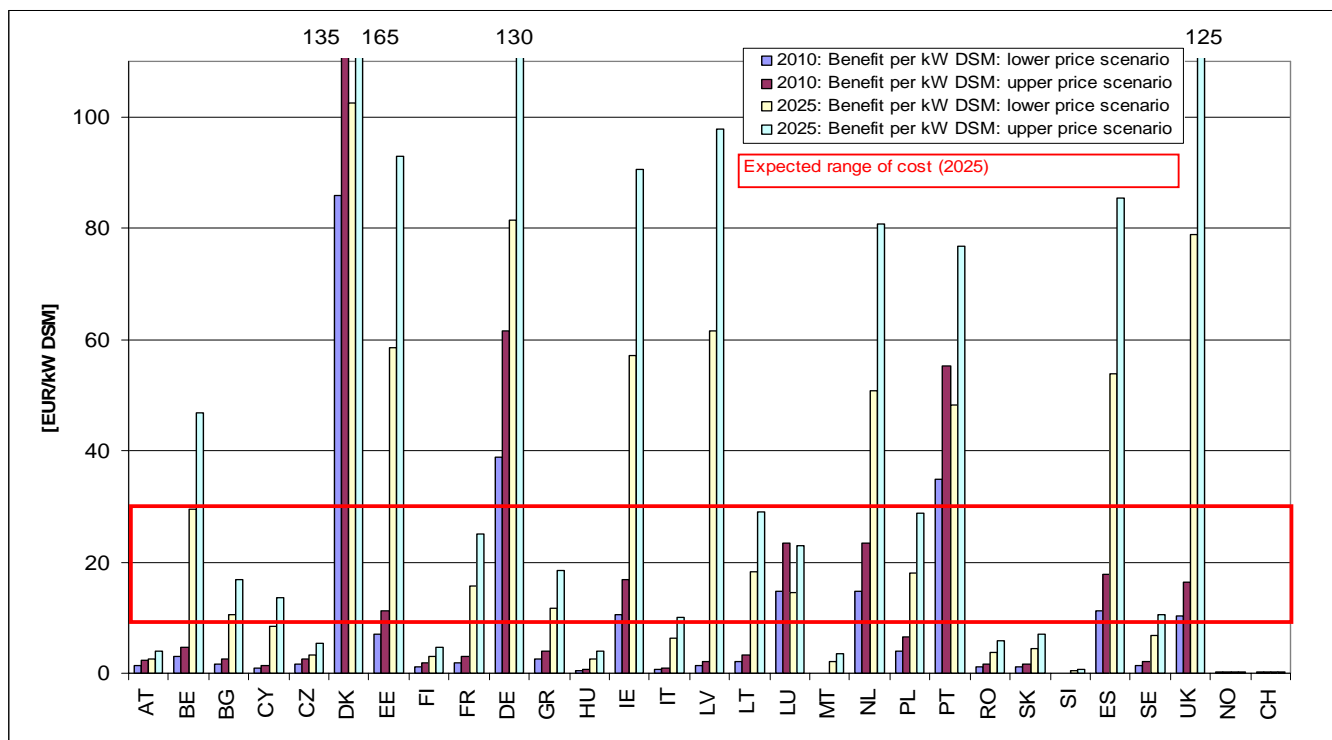
In order to provide a more specific picture for smart appliances in European energy systems, the general results of other WPs were applied to the EU27+NO+CH in 2010 and 2025.

The work first focused on the **assessment of gross benefits of smart appliances** as generically presented by the Smart-A WP 4, which has provided modelled benefits of smart appliances for balancing out wind generation. European countries were classified according to their generation flexibility and the current wind penetration and for the year 2025 in order to choose modelling results from the most appropriate modelling scenario.

These results have then been adapted according to the actual size of each of the national systems. In a second step, a comparison of expected cost and benefits from a system point of view has been provided differentiating both between different appliance types and the different national electricity systems.

The result is that **smart appliances will be beneficial when being used for balancing in many, but not in all, European countries**. Those countries with a low or medium flexibility generation system and with significant wind penetration rates will offer the best economic conditions for applying Smart Appliances for balancing wind.

The figure below compares the expected cost of implementing and operating smart appliances in 2025 with the estimated benefits of the balancing services for an upper and lower energy price scenario (including the economic benefits of avoided CO₂ emissions).



The net benefit can be expected to be even higher than the results presented here when taking into account additional applications of smart appliances besides balancing, such as peak shaving or managing network congestions. In a longer term evaluation, avoided investment cost should also be taken into account. **These effects might make Smart Appliances a viable DSM option even in those countries which do not show a positive cost/benefit ratio in the figure presented above.**

Adding to the analysis of cost and benefit, the work package report furthermore gives a **general picture of the allocation of cost and benefits of smart appliances between different stakeholders and proposes various incentive strategies for the introduction of a system of smart appliances.**

In order to explain how Smart Appliances could work in practice, a selection of Business Models has been developed.

Strategies and recommendations

Based on the results of the other work packages, **guidelines for all relevant groups of actors have been developed and discussed with representatives of these groups in meetings led by the University of Bonn.**

The groups which have been identified as the key actors on the market with respect to the introduction of smart appliances are (a) appliance manufacturers, (b) producers of domestic energy supply systems, (c) electric utilities (producers, distributors and retailers), (d) large-scale producers of electricity from renewable energy sources, (e) policy makers, (f) consumers and their representation, (g) standardisation organisations, (h) providers of smart appliance information and (i) demand side energy managers.

The outcome of this investigation has been summarised in the **WP8-report** which:

- Firstly identifies all factors which might hinder the success of smart domestic appliances as well as strategies to overcome these constraints are collected for each single target group.

- Secondly, develop adequate guidelines and recommendations. These recommendations are assigned to three different categories of actions which have to be taken up:

1. **“Ad hoc” actions**, meaning actions which can be implemented straightaway and that might be relatively easy put into practice (for example: fostering, when possible, the use of hot water for washing machines and dishwashers, within the Eco-Design Directive)
2. **“Short-term” actions**, meaning actions which require some time for preparation (for example: the setting of advantageous off-peak period tariffs).
3. **“Long-term” actions**, which realisation needs an even longer time for preparing the ground (for example: moving towards a cross-sector standardisation for communication signals about availability and demand of energy).

In every case however, the most important point is that action has to begin at the earliest possible date as even long term actions require significant ground work.

Smart-A Book Publication

As already sent on the 2nd of June here are a few sentences for the newsletter announcing our book:

The University of Bonn published recently the book **"Synergy Potential of Smart Domestic Appliances in Renewable Energy Systems"** as part of the SMART-A project. Beside a comprehensive analysis of the synergy potential of 10 domestic appliances like washing machine, tumble dryer, dishwasher, refrigerator and so on, it contains details about consumer acceptance, load curves, various simulation scenarios and constraints concerning each single appliance.

Book references: ISBN 978-3-8322-8082-6 / Editor: Rainer Stamminger

The book can be ordered from:

<http://www.shaker.de/online-Gesamtkatalog/booklist.asp?ID=1375027&CC=661&Reihe=423>

The Smart-A project is now finished.
Check all of our results at www.smart-a.org !