e-harbours

WP 3.7 Application of Smart Energy Networks

Organisational and Legislative Analysis
Summary results of showcase at City of Malmö

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The Interreg IVB North Sea Region Programme
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1 Introduction

Smart energy networks are intelligent and flexible solutions which combine flexible energy consumption, local generation of (renewable) energy and energy storage on different levels. In any smart energy network, the presence of both technical/economical and organisational/legislative conditions is crucial.

The e-harbours report 3.5 focuses on the *technical and economical aspects* of smart energy solutions. The scope of WP3.5 is the translation of the 6 universal business cases (e-harbours report WP3.4) on the level of every showcase. It gives an overview of the potential for the exploitation within the existing local (national) rules and regulations.

This e-harbours report 3.7 focuses on the *organizational and legislative aspects* of smart energy solutions. A long list of general barriers has already been composed (deliverable 3.3).
This report 3.7 addresses the analysis on a local level, and gives an overview of barriers which hamper the exploitation of smart energy systems.

1.1 Description show case

Smart homes consist of seven smartly designed rental apartments in the residence area Western Harbour in Malmö, owned and managed by the energy company E.ON.

Different energy systems for electricity, heating and hot water are tested in the apartments: district heating, air/water-heat pump, gas and solar collectors. A hundred measuring points are installed in each apartment and residents can follow and monitor the energy use via an app on a tablet or smart phone.

Part of the energy is produced locally: solar collectors produce heating and hotwater, PVCs and windmill produce electricity. The grid electricity has a fully variable price connected to the Nord pool spot intraday market.

Each apartment also has a vehicle included in the contract. In total there are five electric cars, one gas driven car, one electric vespa, seven electric bikes.

Smart homes focus on the user perspective:

- Visualisation – all energy use is measured and visualized
- Monitoring – all energy use can be monitored by the user
- Price model – the price model should be easy to understand.

1.2 The strategy/approach

In order to distinguish the organisational and legislative barriers, the following steps have been taken.

Identification of the organisational and legislative barriers of Smart homes has been done with the following steps:

1. Interviews with the energy company EON, which is the construction company and also the property owner of Smart homes.
2. Interviews with stakeholders such as residents of Smart homes

3. Desktop research, on internet and telephone with institutions such as Energimarknadsinspektionen, Svensk Energi

1.3 Scope of the e-harbours showcase at/in Smart homes.

The deliverables of this show case are:

Smart system for with 100 control points for energy use and temperature in each apartment. Software consisting of an app for monitoring and steering energy use.

2 SUMMARY RESULTS

2.1 Case study Smart Homes

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2.1.2 Investigation results

Organisational barriers

Organisational barriers in the present context of Smart homes are related to complexity of the Smart homes business model. The business model of Smart homes is based on a holistic energy system, combining various different energy media – district heating, gas, air to water heat pump, electricity from the grid, as well as locally produced energy from sun and wind. Developing and running a system with this level of complexity requires a close cooperation between the many different energy supply systems. The barrier consist in that the grid owners for electricity (EON Elnät) and gas (EON Gas) have a geographical monopoly, and with the monopoly comes the responsibility to offer the same possibilities for all energy suppliers and that the grid owner cannot favour one electricity/gas

supplier before another. This limits their ability to participate in such joint interventions as a holistic energy system requires. This causes organisational barriers for the energy company EON.

Organisational barriers within a possible cluster would be same as in the present context,. A cluster could be new Smart Homes apartments, the construction companies, property managers, such as the EON-company, the municipality, such as the City of Malmö .

Legislative barriers
Legislative barriers in the present context of Smart homes is related to the regulations on pricing of energy. Smart homes is partly supplied with locally produced renewable energy. The business model is to sell the excess energy from those renewable sources to the grid. However, this only generates a saving on the annual electricity bill (due to the fact that you only get paid about half the price for one own produced kWh compared to what you have to pay for one) and not an actual profit.

Legislative barriers within a possible cluster, such as the EU level, is also related to pricing. Smart homes are using a variable electricity rate. Such pricing is applicable on a deregulated electricity market. In the EU, only ten countries have a deregulated electricity market. The EU-legislation is going towards deregulation, but in the meantime, until the this has been fully implemented it may constitute a barrier for the business case of Smart homes.

3 Overall conclusions

3.2 General Overall Conclusions and recommendations

Organisational barriers are related to the complexity of the business model and the limitations of some of the EON companies to cooperate in a holistic energy system model.
Legislative barriers are related to the limitations to make a business of selling locally produced renewable energy to the net and the use of variable prices.
The business model of Smart homes will be possible to implement in countries with a deregulated market.

4 Lessons learned

4.1 Organisational issues

Running an energy system for a building with this level of complexity requires a common business model that all the energy suppliers involved can agree upon.

4.2 Legislative issues

Legislation can be a barrier, but it can also favour the development of this kind of projects.
Influencing decision makers will be an important part of the process of implementing sustainable living in harbour cities.

4.3 Ideas for further investigation

Development of a model or platform for cooperation on an organisational level for the creation of smart energy systems for buildings.

5 References

[1] Per Rosén, EON, Telephone, meeting 130617, telephone 130923,
[2] Energimarknadsinspektionen, Tomas Björkström, telephone, 130930
[3] Svensk energi, Henrik Wingfors, telephone, 130930