

Newsletter e-harbours #1, September 2011

The e-harbours project is launched!



Nine partners from North Sea Regions Port cities have gathered in the e-harbours project. The e-harbours project aims at stimulating renewable energy for power and transport by optimizing energy usage and production.

On April 14th 2011 the e-harbours project was officially launched at Stuurboord in Antwerp. Read more on the launch and other project related news in this first edition of the e-harbours newsletter. For information on the project objectives please see the back cover of the newsletter.



Yes, I would like to receive
the e-harbours newsletter!
Signup at www.e-harbours.eu

Editorial

The developments of the smart grids technology are currently in a furious pace. The general public, the average end user of energy, however, has not yet noticed. It is our belief that technical developments will add production and consumption of renewables even further. The real leap forward we will create by sharing knowledge and information about the new possibilities. For e-harbours it is a privilege to play a role as 'communicator' in this early phase of the energy transition. By concentrating on concrete examples on a local scale, the complex world of the smart grids and renewable energy will be more accessible to a large audience. We are in the middle of a vibrant development on the energy market. It is our belief that Smart People determine if Smart Grids can be a success.

Jan
Schreuder
Project
manager
e-harbours



Inspiring launch of the e-harbours project!

On April 14th 2011 the e-harbours project was officially launched at Stuurboord in Antwerp. About 70 people gathered for the launch on a cloudy but inspiring day.

During the launch there were presentations from the European Commission, Interreg Programme, EREF and e-harbours project partners.

Speakers and presentations

The speakers during the day were Mr. Luc Arnouts, Chief Commercial Officer Antwerp Harbour, Mr. Mark van Stiphout Assistant to the Director General – DG Energy, Mrs. Amber Sharick, Senior Policy Advisor EREF, Prof. Dr. Ronnie Belmans, Chairman of the European Smart Grid Technology Platform, Mr. Jan Schreuder, Project Manager e-harbours, Mr. David Gray, Professor at the Robert Gordon University, Mr. Gerrit Buist, University of Amsterdam, Mrs. Annemiek Hollander, Municipality of Zaanstad, Mr. Maarten Hommelberg, VITO, Mr. Hans Schaefer, University of Applied Science Hamburg, Mr. Matthew Stuart Nichols, EU Interreg Programme NSR. All the presentations are available for download from the e-harbours project website.

Media coverage

The e-harbours launch was reported on in several media channels, on the e-harbours website you may find links to some of them.





HEAVY LIFT
& PROJECT FORWARDING INTERNATIONAL

DOES YOUR PROJECT LOGIC BUSINESS NEED A LIFT? CL

Home
About Us
News
Digital Editions
Subscribe
Advertising & Media Data
Contact

BUGDEN & CO SOLICITORS
Knowledge, experience and judgement
www.bugdenlaw.com

CEE Cargo Experts
SUBSCRIBE NOW
Click for more info

Project cargo NETWORK

News
Port cities investigate maximum use of renewable energy
April 13 - Nine European cities and universities, confronted with the challenge of making energies to power the industrial and logistics activities which take place in their ports, model that makes maximum use of renewable energy for transport and electricity...

The nine partners are: Hochschule für Angewandte Wissenschaften (HAW) Hamburg (UK), City of Amsterdam (the Netherlands), Robert Gordon University (UK), City of Antwerp (Belgium), VITO (Belgium), University of Applied Sciences Hamburg (Germany), University of Amsterdam (Netherlands), Municipality of Zaanstad (Netherlands), and the European Commission.

E-harbours: groene energie en elektrische schepen
Brussel • Elektrische schepen, hybride ferry's of havens die volledig draaien op hun eigen wind- en zonne-energie, zoals havens uit de Noordzee-regio, Antwerpen, Rotterdam en Hamburg, werken er hard aan om zich op korte termijn om te zetten tot 'e-harbours'.

Havens moeten mee de Europese klimaatdoelstellingen halen
van de Europese klimaatdoelstellingen, 20 procent minder CO2-uitstoot en meer dan 20 procent hernieuwbare energie tegen 2020 - mogen al die havengebieden de komende jaren hun best doen om deze doelstellingen te halen.

Financiële EU-stoet
Onder andere de haven van Antwerpen, de Zweedse stad Malmö, Amsterdam, maar ook kleinere haven van de Vlaamse haven van Brugge, krijgen van de Europese Unie een bedrag van 10 miljoen voor de realisatie van het project.

Successful expert workshop on electric mobility and virtual power plants



At the 22nd of March an 'interaction workshop: experts – showcases e-harbours' was held in the harbour of Antwerp.

During this meeting a panel of experts on different aspects of virtual power plants and electric mobility shared their views on these topics, and answered questions from the organizations working on the showcases.

The topics discussed covered a wide range:

- E-mobility
- Key actors within the showcases
- The role of the aggregator
- Legal issues within smart grids
- IT infrastructure and end-user involvement
- VPP technology

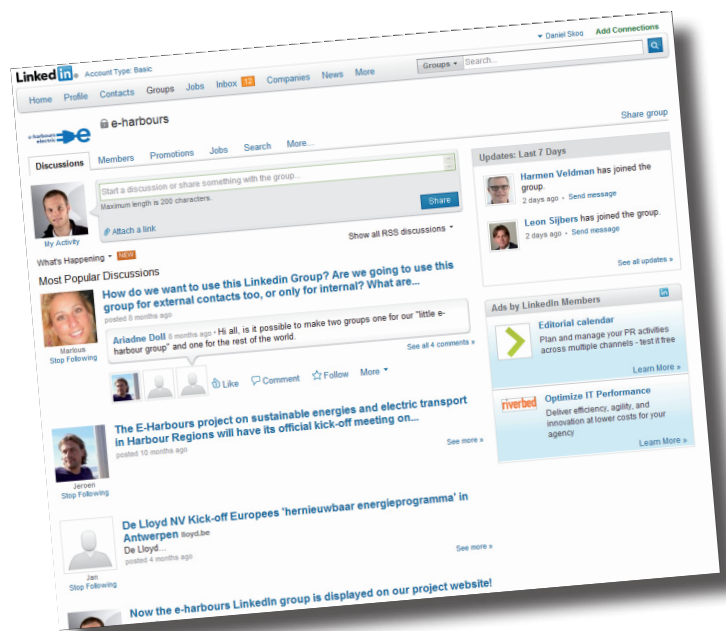
The workshop was considered a success by the participants, since the topics covered answered a number of issues they had with their showcases. The general consensus was that the answers provided by the experts allow them to take a next step in the development of their showcases.

Join the discussion online!

You are welcome to join our LinkedIn group on e-harbours where discussions on smart energy are being held.

Just follow the link below or click the link on the e-harbours website at eharbours.eu

<http://www.linkedin.com/groups?gid=3035541>



Showcase A1: Antwerp

Looking for Flexibility

The goal of the Antwerp showcase is to facilitate the generation and application of renewable energy in harbour regions. One of the factors that hinder development of sources like wind and solar power is variability. The number of Watts produced can vary considerably, due to weather conditions.

This poses a challenge for the electricity grid, which has to be kept in balance at all times. One possible solution is identifying flexibility in the demand for electricity, so that the variability in production can be accommodated. This enhances the opportunities for renewable sources.

Window of flexibility

The first aim of our research in the Antwerp harbour is to identify industries that can provide a flexible demand for energy. In close cooperation with the Antwerp Port Authority, we contacted companies that operate cooling and freezing facilities. Currently, we work with five of these companies, analysing the flexibility that their production process contains. One of the participants can vary the temperature of the products in its freezing cells between minus 30 and minus 18 degrees celsius. This massive temperature swing creates a large 'window of flexibility'.

Economic value

In the next phase, we assess the economic value of this flexibility. We study the contracts that the companies have negotiated with their electricity providers. For example, a great price differential between daytime rate and night rate results in a potentially high economic value of flexibility. Another factor is the occurrence of peaks in the electricity consumption. The more predictable, and the more flattened out your consumption of electricity is, the better the price you can negotiate with your provider. So why not use the flexibility in your production process to lower peak demand?



A program developed by VITO (the 'IntelliGator') simulates the production process and the energy consumption of the participating companies. This produces an accurate insight in the revenues that optimal use of their flexibility can provide.

Amoras

This fall, VITO is going to cooperate with another big venture in the harbour area: the AMORAS project. This impressive project for the dewatering and recycling of sludge from the Antwerp harbour will start operations shortly. The three most energy consuming phases in the process are the sand separation phase, the dewatering phase and the water purification phase. The process might be halted temporarily without adverse effects. A source of flexibility!



Showcase A2: Hamburg

A green harbour in the green capital



The aim of the Hamburg showcase is to investigate and model contributions of port facilities for a virtual power plant, VPP, in Hamburg.

The focus will be on utilization harbour specific infrastructure and facilities as flexible energy storages. Especially, the huge cold storages could make a significant contribution. The basic idea is quite simple: In times of high renewable energy production cooling devices are activated. Thereby, storages will be cooled down a bit more than usually necessary. This way it can be achieved that in times of low energy production the cooling devices (compressors, pumps etc.) can stay deactivated for a longer time. In order to actually realize contribution to the virtual power plant we have been starting to contact relevant companies located in the Port of Hamburg, among others two large cold storage operators. After presenting the project's concept, further steps are negotiated at the moment.

Next Steps and final Aim

In the next few weeks we will hold on-site inspections with technical experts in order to evaluate the possible contribution of reserve capacity from the different sites to a virtual power plant.

We will identify key data on the performance of the facilities, data about operation management and operation requirements as well as existing and additionally necessary ICT infrastructure.

We will then install smart meters for a detailed measurement of the energy consumption. Based

on these data we will build a model of the facilities and simulate their possible contribution to a virtual power plant. After that further negotiations about terms and conditions of a direct integration of the investigated facilities into a VPP will be initialized. The final aim is to successfully connect part of the harbour infrastructure and or harbour facilities to a VPP that the local energy supplier Hamburg Energy is putting up in a larger R&D project called "Smart Power Hamburg".



E-harbours was awarded the logo "A project in the context of Green Capital". Hence, our project is now an official project of the "European Green Capital 2011" year in Hamburg. Throughout the year, interested visitors are able to read about our project on the Green Capital website

Showcase A3: Uddevalla

Integration of renewable energy from CHP-plant in smart grid



As a partner in the e-harbours project Uddevalla Energy sought a showcase with not only the environment in mind but also looked for a commercial interest matching our business plan. Along the Swedish West coast there are three neighboring cities; Trollhättan, Uddevalla and Vänersborg, that currently are planning to build new district heating plants as the current ones are in need of replacement. We see a possibility to cooperate and gain efficiency and cost reductions by connecting a culvert grille and jointly building a larger Combined Heat and Power plant, CHP-plant.

During this feasibility study we need to bear in mind some certain issues. For example, we will need to investigate the flexibility in present energy profiles. Furthermore, the potential to optimize electrical production both from a new CHP-plant and wind electricity production are a necessary part of our research and development. The business case should show that smart grid applications can be realized in a district heating net using renewable energy sources. The requirements and conditions for a common CHP-plant to supply renewable energy will be assessed

as well as the potential for renewable on-site. Investigations currently show a demand of approximately 900 GWh to fulfill residential end consumers' energy need in the region. Uddevalla Energy together with Trollhättan Energy and Vattenfall will investigate the need of heat in a wider concept area than the present operation. Today the three cities with their local energy companies only work in strict local areas. This is a valuable opportunity as we are also facing a new governmental regulation with third part entrance in the heating net.

Objectives

- Develop a concept of innovative connection to match supply and demand of heating and electrical power.
- Energy storage will be included to match and optimize electrical productions from the CHP-plant and the fast growing number of wind turbines.
- Renewable energy production from other micro production sites will also be taken in consideration.

Deliverables from the feasibility study of integration of renewable energy from CHP-plant in smart grid:

1. Regional strategy for optimal energy integration in the West coast area north from Gothenburg.
2. Smart grid applications can be realized in a district heating net when integrated in a CHP-plant.
3. Optimize production of heat and power from renewable energy
4. Energy cost reductions for end consumers such as households and local industries.

If the feasibility study turns out well we plan to make it real. If so, the large scale production site of approximately 900 GWh renewable energy will lead to a healthier environment in the region by reducing emissions to air and water.

Showcase B1: Zaanstad

Zaanstad e-harbours showcase officially opened in June



Alderman of environment Robert Linnekamp officially started 'ReLoadIT' by opening a new bicycle storage centre and renewable energy source.

The centre provides room for 700 bicycles to be stored in Zaanstad's city centre. The real assets are solar panels, a smart grid and charging points. This is Zaanstad's showcase: 'ReloadIT'.

The project is part of Zaanstad's strategy to maximize the production and consumption of renewable energy. The primary goal is to investigate how to do this affordable on a small scale. Large scale implementation will take place with lessons learned. Next to that, Zaanstad shares knowledge with European centres of excellence, such as the Flemish institute Vito, the Robert Gordon University of Aberdeen and the Port University of Hamburg.

ReloadIT: Predicting to save money

The bases of the lessons learned are four-fold: forecasting, measuring, regulating and smart contracts.

A system is designed to forecast the amount of renewable energy produced and the energy demands to be met. Weather conditions (sun, wind) will be used to predict the production. The planning of the usage of 17 electric cars is used to predict the energy consumption. Extensive monitoring of energy production and consump-

tion plays an important role. By regulating supply and demand on the basis of these data collected, we are able to balance production and consumption. This is what we need to maximize the use of renewables. The final aspect is contracts: Smart Contracts are needed to make sure the return on investment goes to the right (investing) stakeholder.

Communicating for awareness

ReloadIT is supported by the Interreg IVB NSP. One of the objectives is to exchange knowledge in an international setting. For Zaanstad the regional exposure of the showcase is important too. This is necessary, because co-operating with different stakeholders is needed to meet the local climate objectives. By communicating on e-harbours and the ReloadIT showcase we reach a broad regional audience. Both private companies, investors, public bodies and networks have already showed their interest in the developments of ReloadIT.

Next steps

More solar and wind sources are to be connected as well. The larger municipality energy consumption patterns are examined and incorporated within the smart grid. Energy contracts for delivery of surpluses and financial implications are studied, as well as legal issues regarding the production and transport of energy.

Bottom line for ReloadIT is: forecasting demand and supply of (renewable) energy helps us lowering our carbon emission and our energy bill.



Showcase B2: Amsterdam

Electric boats become regular sight at Amsterdam canals



Amsterdam is famous all over the world because of its canals. In the past ten years the people of Amsterdam have rediscovered the river Amstel as a place to recreate. The number of leisure boats has increased from 7.000 in 1999 to 15.000 in 2011.

The water and the smalls boats bring pleasure to many. But the downside of al those boats with outdated motors on the water is that there is air pollution on the canals on the most sunny and wind free days. That is why the city of Amsterdam stimulates boat owners to choose for electric motors.

Stimulating electric boating

Last year the city saw a growth of over 50% of electric boats. With this growth the demand for charging points also increases. Through the e-harbours project the City of Amsterdam will stimulate the infrastructure to re-load all these electric boats. The project works as a pilot for the future, when electric boats are getting more common.

Last year we installed ten charging points at the entrances of the Amsterdam waterways. Thanks to the e-harbours project another three will open this year, and in 2012 another three spots. Elec-

tricity used to charge the boats will come from sustainable sources. The energy is going to be from the waste of the Amsterdam people and will be provided by the Waste and Energy company of Amsterdam.

Promoting electric boating in the city

Amsterdam wants to be a sustainable city, and electric boating helps maintaining the sustainable climate that keeps the city attractive to its inhabitants. And it is also a beautiful way for tourists to explore the city.

At June 5th all the Amsterdam boat owners were invited by the city to come to the electric boating market. There were about 1000 people who walked and boated on the market. A lot of them got really enthusiastic and a few of them even bought an electric motor on the spot. And the end of the day, visitors of the market also had a chance to see the finish of the electric race. A lot of the participants of the race also visited the market and made a little tour with one of the electric boats.

In February the Amsterdam delegation welcomed the partners of the other e-harbours cities. It was also taking part in the preparation meeting in Antwerp

Showcase B3: Malmö

Smart energy production, consumption and mobility in Malmö



Malmö, in southern Sweden, has done a journey from an industrial city to a city that focuses on knowledge and sustainability. Nowhere else is this transition as visible as in the Western Harbour in Malmö.

The old shipyard that built the economy of Malmö was based here but did shut down in the eighties. Today a new housing attractive and sustainable area in the Western Harbour is growing with houses and offices.

The project

To continue this development City of Malmö supports the initiative of E.ON to build eight new smart town houses. The Thinking Energy initiative will demonstrate new ways to generate and use energy through interaction with its customers. The initiative does support all three corner stones of the e-harbours project; smart grids, electric mobility and renewable energy.

The eight houses will be equipped with different solutions to try new techniques and measure and monitor the results. All houses will be equipped with smart grids where also price adjusting solutions will be examined for steering of electric cars charging, freezers and laundry machines. By using the machines when demand for electricity is lower pollutions from electricity production is reduced and renewable energy production is supported. Renewable energy sources such as photovoltaic's and urban wind power plants will be integrated in the buildings.

There will be five parking lots with electric charging points for the electric cars of the inhabitants. All the inhabitants will have access to iPad software where they can monitor and follow their energy usage in a pedagogic way.

Next step

The inauguration of the construction of the houses took place in June 2011 and according to plan the houses will be ready and customers shall be able to move in the summer of 2012. All the information on energy usage, even on such a detailed level as room and hour base, will be made available to the researchers from University of Lund that follows the initiative. The electric vehicles and charging points will be monitored and evaluated from energy usage perspective but also to see how much they are in use.



Showcase B4: PURE

Smart grids and renewable energy in Scalloway harbour



Scalloway is an important fishing harbour situated on the west side of the Shetland Islands. The relatively small size and the large variety of activities within the harbour area make this site a unique interesting show case for the uptake of smart grid and renewable energy solutions into a harbour area.

Fishing harbours such as Scalloway have strong environmental impacts with high CO2 emissions and fish waste. The energy demand is high due to the refrigeration and fish processing plants contained within the harbour area, along with transportation, heating systems and shore power for marine vessels whilst in the harbour.

The aim of the show case is to improve the harbour sustainability, improving efficiency and facilitate the possibility for the intervention of renewables, smart grids and virtual power plants in the area.

Site analysis

An accurate site analysis has provided the required knowledge and information on harbour activities. In order for the project to be successful it was crucial to involve all harbour stakeholders along with the harbour authority. Meetings have been held over the last few months to introduce the aim of the e-harbours project to the Scalloway harbour stakeholders, identify possible

achievable benefits and to let all stakeholders understand the commitment required from themselves, as well as the Pure Energy Centre (PEC) and Robert Gordon University (RGU) for the success of the project. To date the information gathered so far has led to the production of the first draft of the harbour energy consumption profile and a description of the overall electrical network.

Monitoring system

More in depth analysis of the harbour energy profile requires the installation of distributed sensors and data loggers to monitor the main electrical parameters for the most important nodes of the electrical network. The analysis must also include the identification of the most suitable renewable energy sources on site, for this reason additional weather stations have been identified as a requirement to be installed in the harbour area, in order to predict the performance for possible solar or wind renewable energy system.

Currently an accurate design of the monitoring system is under development by the showcase's partners, PEC and RGU. The collaboration between PEC and RGU with the focus on Scalloway harbour provides an excellent collaboration with shared experiences on real on-field applications and pure research activities.

Robert Gordon University

Benchmarking and comparing the performance of different e-harbours showcases

As part of e-harbours, seven showcases have been developed to look at innovative ways of managing energy use and reducing carbon emissions in harbour cities using combinations of renewables, smart grid technology and electric mobility.

This showcase seeks to evaluate the relative effectiveness of technical two showcases in reducing energy use and carbon emissions, which will assist policy makers to identify those innovations which can be 'scaled up' in other harbour regions in the North Sea Area and across Europe more widely. It has two broad objectives:

- to benchmark, evaluate and compare the effectiveness of the technical showcases in reducing energy in harbour cities
- to test and review the ability of different evaluation methodologies to capture and compare the effectiveness of a diverse range of technical interventions

In seeking to review the effectiveness of the technical showcases, it might be expected that the most effective interventions will be those that deliver the greatest economic benefits at the lowest cost per kW reduction in energy consumed.

Nevertheless, other factors are also important (social costs, investment costs, technical reliability, ease of replication, etc) and the 'effectiveness' of any given showcase will vary depending on the criteria and the methodology used to evaluate them. Any method of evaluation will involve prioritising between a range of factors. In other words, a key part of evaluating the showcases will involve deciding on which outcomes are most important and finding a methodology to evaluate the showcases, which is effective at giving more weight to these factors (at the expense of others).

In terms of progressing this work:

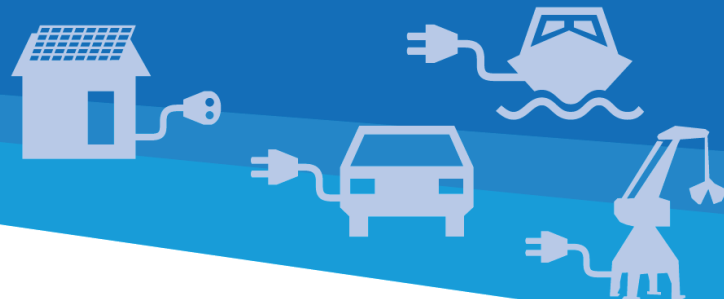
- A number of possible methodologies for

evaluating the showcases have already been identified.

- Once all the showcases are fully described by the partners and understood by the Robert Gordon university analysts, the next step will be to start gathering data from showcase partners, both financial (e.g., costs, savings, payback period) and non-financial (e.g., CO2 emissions, social benefits, technology maturity).
- The team will then design several different evaluation methodologies for benchmarking and comparing the seven showcases.
- Once data has been gathered and run through the various evaluation methodologies, the team will test the robustness of the results.
- The team will then discuss the results with showcase partners in order to (i) review how showcase performance varies depending on the methodology/criteria used and (ii) identify and agree a single methodology or combination of methodology that best captures and compares the performance of the various showcases.
- The final stage of the work will be to work with e-harbours partners to draw some firm conclusions and make recommendations on the effectiveness of different showcase initiatives (particularly in terms of scaling up across the North Sea Region).

The key technical challenge in this showcase will be to obtain useful, comparable data from a diverse range of showcase interventions.

Findings from the work will be disseminated through: e-harbours reports and the project website, at the final e-harbours conference; conference and seminar presentations for stakeholder, practitioner and academic audiences; press releases and engagement with national and international media; and through academic publications.



The e-harbours project: Towards clean and energy innovative harbours in the North Sea region



The objectives of e-harbours

The challenge is to create a more sustainable energy model in harbour regions on the basis of innovative intelligent energy networks (smart grids). e-harbours focuses 3 objectives:

- Increase the production and use of renewable energy in harbour cities. Harbour cities have extensive industrial areas with a great potential for development of sustainable energies; from wind, solar PV, tide, waves and the reuse of industrial waste, heat or cooling available
- Increase the use of energy smart grids. Attuning demand and supply of energy by flexible demand management, instantaneous load shedding (both directions), energy labelling, intelligent storage
- Increase the use of electric transport, a perfect partner to connect to large scale renewable energies and leading to a more healthy environment in the harbour regions

Who are the e-harbour partners?

The lead partner of the e-harbours project is the municipality of Zaanstad in the Netherlands. The other partners are:

Municipality of Amsterdam, NL
Port of Antwerp, BE
City of Malmö, SE
Hamburg University of Applied Sciences, GE
Pure Energy Centre, UK
Robert Gordon University, UK
Uddevalla Energy, SE
VITO, BE

The project is financially supported by the Interreg North Sea Region program.

More on e-harbours

- Lead Beneficiary and contact:
Municipality of Zaanstad
Jan Schreuder
Tel: 0031 (0)629027834
j.schreuder@zaanstad.nl
- Supported by: EU Interreg IVB
North Sea Regions –Programme
- Priority: 3: Improving the Accessibility of Places in the North Sea Region
- Area of Intervention: 3.3: To promote the development of efficient and effective logistics solutions
- Duration: 01/09/2010 - 31/08/2013
- Website: www.eharbours.eu