e-harbours electric

Newsletter e-harbours #5, October 2013

Balancing the smart energy system

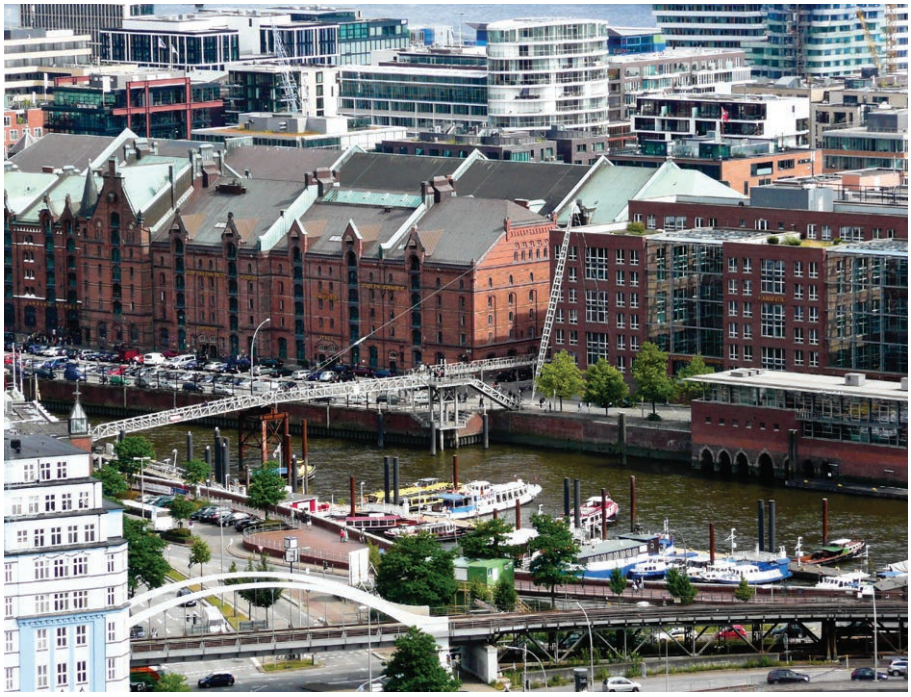

Photo: Colourbox

Hamburg is one of participating harbour cities in the e-harbours project

The e-harbours project is nearing its final stages (the project will be wrapped up during a final conference in Zaanstad, in February 2014). What type of results can be expected from the project? A short overview of the work that has been done in the different research teams.

Read the full story on page 4

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”We hope to inspire you”

”We’re not there yet. But ever more end-users realize that renewables, demand side management, smart grids, balancing capacity are moving to the core of doing business.

Read the full editorial on page 2

‘Power to Heat’

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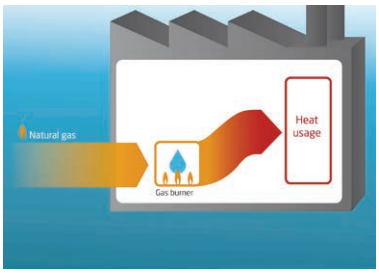

Read the full story from Hamburg on page 8

The Interreg IVB North Sea Region Programme
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Editorial:

”We hope to inspire you”

Energy is in the news nearly every day. Background articles on fair pricing, the share of renewables, taxes and even flexibility appear in the economy section of our newspapers. The e-harbours project now experiences a setting that is quite different from the moment the project started. Awareness has increased, the need to act with energy management and the possibilities to profit from it, have gained momentum.

The e-harbours showcases have added value in this discussion. In the participating harbours the exercises have been put into practice to actually make a step forward. In each of the harbours we addressed 4 basic aspects of what might be called the introduction of the “e-harbours-way”. We looked into Technical, Legal, Organisational and Economical/ Financial issues.

Smart Grid technology is advancing fast, which enables all stakeholders in the energy system to enter the next phase. But the economical issue remains. Looking at the level and the volatility of energy prices, one might expect a true business case. Even for the exploitation of e-mobility as a balancing capacity – dispersed, but huge by its numbers. Local legal issues/ energy taxes and organizational aspects seem to hamper this.

Apparently the profit is still limited so it is still conceived as ‘not worth the trouble’ by the end user. So we’re not there yet. But ever more end-users (companies, households, local authorities) realize that renewables, demand side management, smart grids, balancing capacity (and of course saving energy) are moving to the core of doing business.
In the upcoming months it is the projects’ aim to translate the findings of the individual showcases and case studies into a framework for further implementation. This will enable a random harbour area to estimate the possibilities of Smart Energy Solutions in their local circumstances.

For now: we hope to inspire you with the stories of our local research in the showcases.

Jan Schreuder
Project manager
e-harbours

E-harbours newsletter.

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Photo: E-harbours (where nothing else stated)

Production: Daniel Skog, City of Malmö

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Website stories from eharbours.eu

Cooperation Large End Users and Consumers on Smart Grid Zaanstad

The Municipality of Zaanstad and the surrounding region are seriously working on implementing 'smart grid modelling', in which electricity and (residual) heat are connected. It is a joint project of businesses, housing associations, investors and network company Alliander. Participants from the (semi-) public sector include the municipality of Zaanstad, the province of North Holland and the Zaanstad Medical Center.

http://eharbours.eu/uncategorized/cooperation-large-end-users-and-consumers-on-smart-grid-zaanstad

Study on hydrogen use and power-to-gas potentials in the Hamburg harbour

One focus of the e-harbours showcase in Hamburg is to examine how a surplus of wind energy occurring in the north of Germany could be used in a smart way. A concept that has been increasingly discussed over the last years is called power-to-gas: Producing hydrogen through electrolysis, and feed it into the gas grid. However, especially in harbour regions, there is also a direct demand for hydrogen – why not combine these two aspects? This approach is discussed in a recently published report by the e-harbours Hamburg team.

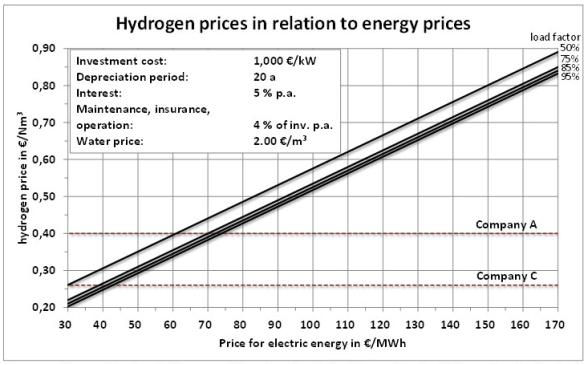


Figure 1: Hydrogen prices for a hydrogen provision using electrolysis. Prices are given in relation to the price for electric energy and the load factor of electrolysis.

http://eharbours.eu/uncategorized/study-on-hydrogen-use-and-power-to-gas-potentials-in-the-hamburg-harbour

Staff exchange Hamburg – Malmö

During late August a delegation from City of Malmö visited Hamburg University of Applied Science to learn more on the findings of the e-harbours project in Hamburg. Hans Schaefers and Philipp Wellbrock, from Hamburg University of Applied Science held presentations on the German energy system and the changes it is going through in general and the e-harbours showcase in specific.

http://eharbours.eu/showcase-events/staff-exchange-hamburg-malmo

Balancing the smart energy system – an overview of e-harbours showcases

Photo: Colourbox

View over the Amsterdam harbour

The e-harbours project is nearing its final stages (the project will be wrapped up during a final conference in Zaanstad, in February 2014). What type of results can be expected from the project? A short overview of the work that has been done in the different research teams.

The main goal of the e-harbours project is to facilitate the addition of renewable sources to the energy system - on all levels, from local networks to the national power grid and the European level. We all know that renewables in general have an intermittent character. That means a rising share of sources like wind and solar power has to go hand in hand with an increase in balancing power within the energy system.

The urgent need for balancing power is clearly visible every day now: even at the current modest levels of renewables (frontrunner Germany reaches a renewable share of about 20%), great problems arise for grid operators. Regularly, wind turbines have to be shut off from the grid, to keep the system balanced. In those instances, renewable energy is wasted, and conventional (gas-fired) power plants have to do the job. This situation prompted Jef Verbeeck, researcher at Vito, to remark: ”The European countries have invested heavily in renewables, and subsidized different types of renewable production. That was a good idea. But now they should complement those investments with an effort to find balancing power, making good use of the flexibility that is available on the side of the end-user. Otherwise we are going to waste a lot of valuable renewable energy when there is plenty of sun and wind or even worse, run into blackouts when there is no renewable energy at all.”

Several showcases in the e-harbours project (like Antwerp, Hamburg and Zaanstad) concentrated on identifying and enhancing types of balancing power that have been underrated and underused up till now. Identifying flexibility in both the production and the consumption of energy paves the way for Demand Side Management, a core concept in the smart energy systems of the future. On this topic, a lot of research still has to be done, but even more importantly, a lot of practical experience has to be built up to grasp the full potential of the technology.

Other research groups (like Amsterdam, Malmö and Zaanstad) have studied the potential of electric transport. Of course electric transport in cities and harbours has favorable effects on the emission of CO2 and other obnoxious substances. Perhaps even more interestingly, the batteries in electric cars and boats can play a balancing role in local grids.

Within e-harbours, a growing interest can be discerned in possibilities to store energy, thus helping to balance the grid. The lithium batteries of electric vehicles provide a huge but dispersed storage system at relatively high costs. The research team at Hamburg has been investigating the chances for 'power to gas' technology, in which excess power from renewable sources is used to produce hydrogen gas. The gas can be used later to fill in peak demand for power.

The teams at Hamburg and Zaanstad now are investigating an alternative way to store energy locally: 'power to heat'. These systems tend to be constructed around a district heating system (or an industrial system in which a lot of heat is stored). Excess heat from industries can be used for heating institutions or blocks of flats. But the system can also be used as a storage system for excess (green) power: by using very old technology, electricity can be used directly to produce heat.

What ideas are the best suited to implement in your situation? That is the topic a research team of the Robert Gordon University in Aberdeen tries to settle, by devising benchmarks that make the effects and gains of a technology visible. We hope to see you all at the final conference of e-harbours, February next year!

Showcase: Zaanstad, Netherlands. City of Zaanstad.

Zaanstad aims for an open and smart energy network

Local industries and institutions get involved in Power to Heat.

The Municipality of Zaanstad is investigating the setup of an extensive smart energy network, in which local industries and large institutions participate. The smart energy network will connect local users and producers of different forms of energy: heat, gas and electricity. The core of the network will be the existing electricity grid and a newly built district heating system.

Zaanstad has stated – like many other Municipalities in the member countries of the EU – that it wants to be carbon-neutral in 2020. "But we soon found out that we needed more knowledge and experience in the field of energy to realize our climate goals, "says Jan Schreuder, project manager of e-harbours and civil servant at the Municipality of Zaanstad. "We wanted to understand the problems and the possibilities of a new energy policy in connection with our local industry, that is large-scale and internationally oriented. We learned fast through the cooperation and exchange of information with these companies, and with the colleagues from e-harbours. That provided us with the knowledge to rethink our local energy strategy."

New energy contract

An important step in the direction of a carbon neutral Zaanstad is to improve the 'carbon footprint' of the Municipality itself. With technical and juridical assistance from other parties, Zaanstad has negotiated a new energy contract that not only reduces the energy costs of the Municipality, but also opens up possibilities to become an active player on the energy market. Jan Schreuder: "Our smart grid REloadIT played a crucial role in this change. It was devised to charge the electric car fleet of the Municipality with power from our own renewable sources. But once we got familiar with this system, we discovered the great balancing opportunities the car-batteries provide. That made us even more aware of the chances we have to exploit flexibility within our Municipality. Think for example of installations like sewage pumps, water treatment facilities and private wind turbines."

Story continues on page 6 »

Showcase: Zaanstad, Netherlands. City of Zaanstad.

Zaanstad aims for an open and smart energy network

Story continues from page 5

» Partners in industry

"Then we started thinking about expanding our local network with local industries and providers of renewable energy. We studied the construction of a network on a new industrial site, where a private wind turbine can feed power to a large end user. The case-study focusses on the optimization of the energy match, avoiding energy taxes. It sure proved to be a business case. But the real issue is: how can we help introducing renewables on a large scale, even when we do not produce this energy ourselves? So now we are aiming for a much larger contract: a smart and open energy Network Zaanstad, that will focus mainly on 'energy management' for a group of companies and end-users. To make this possible we introduce a buffer for 'power to heat'."

Facilitate input of renewables

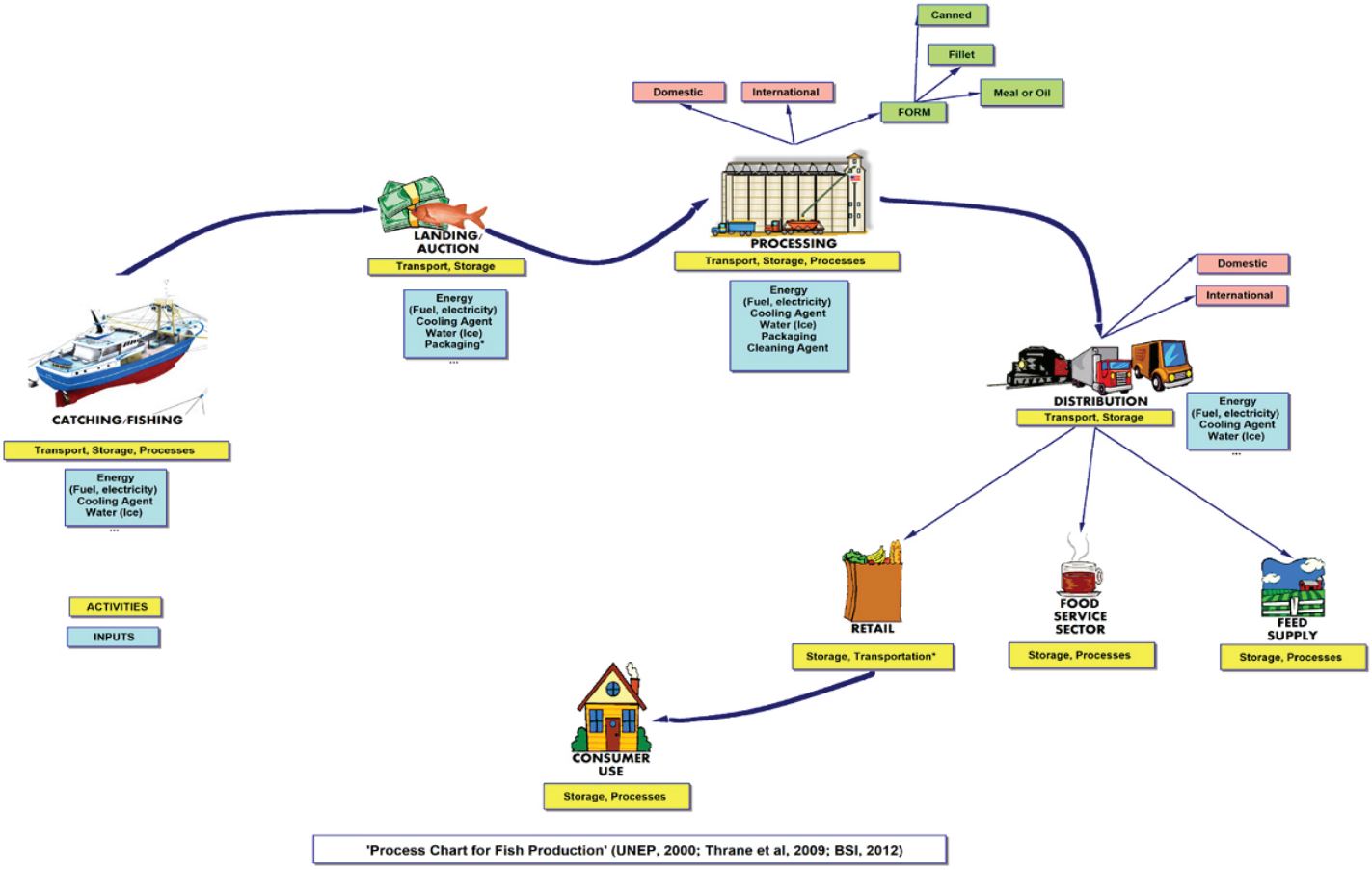
"By combining the energy-input (electricity and gas) for all contract partners we want to get acces to another level of the energy market. The presumption is that by offering both negative and positive capacity, we are able to facilitate the introduction of regional and local renewables. The contract involves some of the largest industrial production units in the region, that have residual heat to offer. But also large end users of heat like the hospital. Heat is taking up to 40% of all energy consumption in Zaanstad. So recycling the industries' residual heat delivers a big win. Some of the largest industries in the region (mainly active in food processing) are keen to reduce their carbon footprint. Cost reduction is another driver. By cooperating with the Municipality another asset is at hand: balancing capacity for electricity, reserve capacity for heat. We aim for a stronger energy-relation between the industry and the local community, since we know that will be profitable for both."

No less that 23 parties are involved in the first phase of the project, in which the business case for (parts of) the system will be investigated. Among them the Dutch grid operator Alliander, the Province of North Holland, food producers Tate&Lyle and Royal Verkade, packaging giant Goglio, energy engineering companies Dalkia and Cofely, and local companies that incinerate waste to produce energy.

Read more on www.eharbours.eu

Aberdeen, United Kingdom. Robert Gordon University.

Devising an energy label for fish products



The Aberdeen team of e-harbours has been developing a new line of research, concentrating on the energy content of fish products. Remarkably enough, this is a new theme for the industry.

One of the conclusions in a research paper on the topic (prepared by Ebun Akinsete) states: "Up until now, sustainability [in the fishing industry] has been very much focused on bio-ecological elements, and issues such as energy had not been considered until recently."

The ultimate goal of the research is to come up with an energy label, that helps the consumer in the shop decide which fish product to choose. To reach that goal, a lot of energy modeling has to be done. The team is working on an energy model of the 'supply chain' for fish landed in Scottish fishing ports like Peterhead and Fraserburgh. That means calculating in the energy consumed in catching, landing, logistical transportation, processing, and packaging, following the different supply chains from the catch at sea to the final customer.

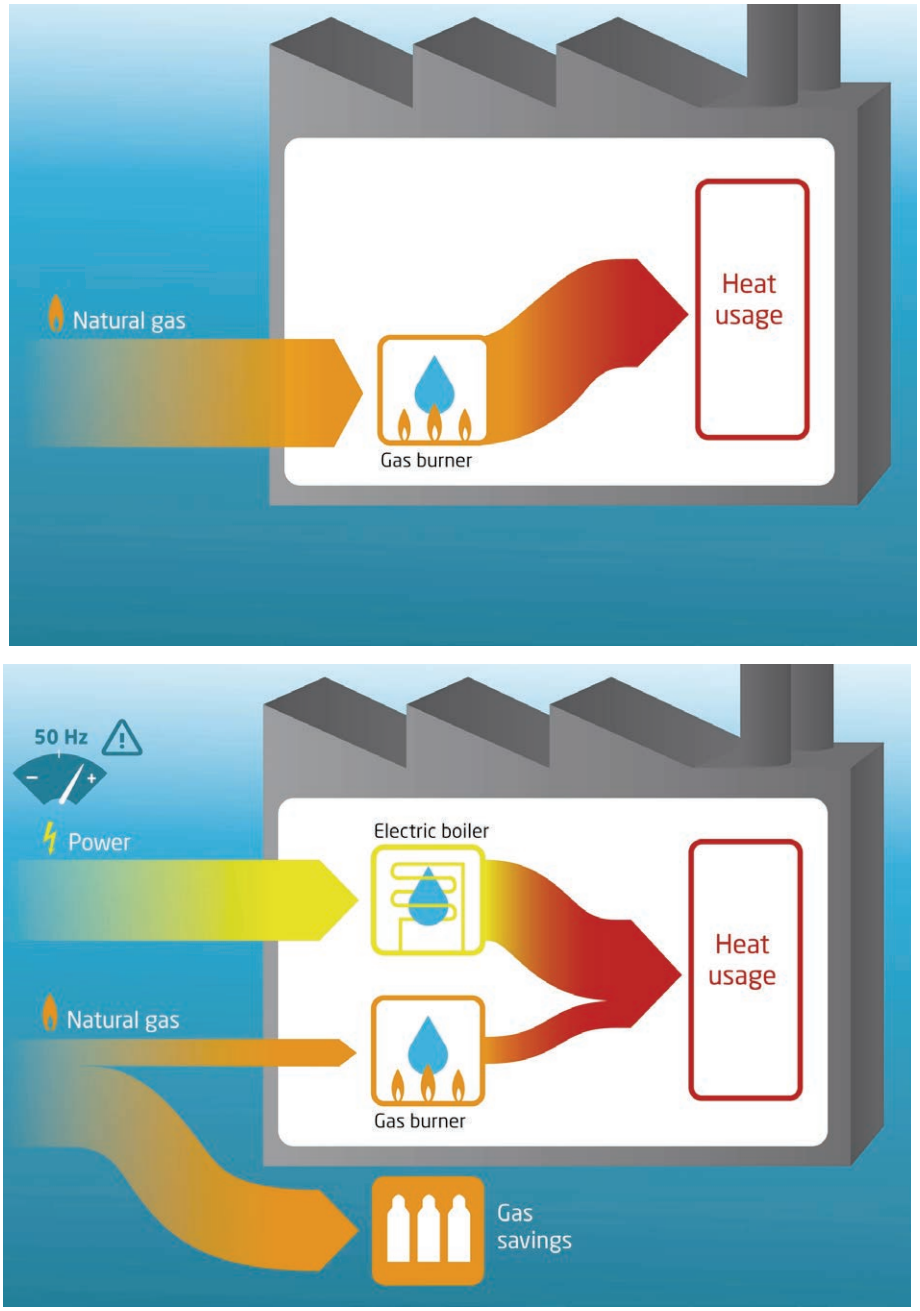
The Aberdeen study is breaking new ground. Up till now, there is almost no research done that specifically addresses energy consumption in the fishing industry within the UK. There is, for example, no communis opinio between experts on the question where the greatest amount of energy is consumed: in the catching or in the processing of fish?

Just as important is the consumer side of the coin: how do consumers read labels on products, and how does that information influence their behavior? The Aberdeen team wants to develop an appropriate energy labeling scheme for fish products landed in the North Eastern ports of Scotland, combined with a web portal for domestic consumers.

Showcase: Hamburg, Germany. University of Applied Sciences (HAW Hamburg)

‘Power to Heat’: Key technology in the energy transition

Germany is doing well in the field of renewable energy, compared to other European countries. But adding intermittent sources like wind to the national grid remains a problem. “Even with a share of renewables of under 20% we already encounter situations in which not all wind power can be accommodated,” says Philipp Wellbrock of the e-harbours team in Hamburg. “It is a bad thing that we have to shut down wind turbines because we are not able to stabilize the grid”.



Saving over-production of renewable energy is a challenge and opportunity

In the Hamburg showcase, remedies for this problem are studied. Philipp: “One of the solutions can be to store a part of the renewable production. First thought is of course to use batteries, but that is still an expensive technology. We have investigated the possibilities of power to gas, using wind power to generate hydrogen gas.”

Matthias Kühl of the Hamburg team adds: “This gives a product that is well storable, and can be used to produce heat or electricity at peak hours. The big advantage is that the gas is virtually emission-free. But the energy efficiency that we can reach with this process is still quite low, around 40% overall.”

Philipp: “It is much better to skip the conversions of one type of energy to another, and use the surplus of power directly. So we have been looking for other technical solutions, and investigated the possibilities of power to heat. The excess energy of wind turbines or solar panels can be used to produce heat, which is usable in production processes or to heat buildings. That way, we substitute

natural gas that otherwise would have been burned to produce heat. This is why we also like to call the concept power to saved gas.

But does this not demand a large investment in new technology?

Matthias: "In fact, it is quite simple to retrofit heating systems with electric boilers. And it is proven technology, in use since the beginning of the last century. This way we can reach an energy efficiency of over 90%!"

Philipp: "We found a case that gives really the perfect example what we can achieve with power to heat. A chemical plant in the Hamburg harbour that recently has been equipped with a Combined Heat and Power installation (CHP), designed to run at full power almost 100% of the year and cover most of the company's heat and power demand."

Matthias: "We investigated two scenarios how the company could contribute to grid stability and earn money, by selling negative reserve capacity to the grid operator. In the first one, the CHP would be regulated down when there is a surplus of power in the grid. Electricity would then be taken from the grid and the heat demand covered by gas boilers, which are still in place. This just requires a flexible operation of the CHP, which is quite easy to implement, and already delivers some nice revenues. The second, more interesting option is that an electric heating device is added that can replace the CHP. Thus, a lot more load can be absorbed to stabilize the grid if needed, because heat demand is also covered by power from the grid. We calculated that this second option will deliver a sizable return on investment. The company is now investigating the different options."

What are the reactions if you introduce this concept to companies?

Philipp: "There is some skepticism to overcome. For years, the common sense was that it is foolish to produce heat from electricity, since electricity is the "higher quality" and more expensive energy form. But the energy transition towards renewables is changing that. People get used to the idea that in certain moments, it is economically and ecologically wise to actually increase your power consumption."

And the idea is spreading, as we can see in the very interesting project that is arising from the Zaanstad showcase

Philipp: "Yes, it's a great concept, and I think it's no coincidence that they are planning to use power-to-heat technology to optimally integrate local renewables. Moreover, they are making use of the fact that heat can be stored with very little losses. This gives you a lot of flexibility over time, especially if CHP plants are involved.

In a way, they are doing the same thing locally what our showcase is aiming at in a larger context: Use renewable energy when it's abundant, and save precious fossil fuels for times when power is scarce."

e-harbours electric

e-harbours Final conference

February 12-13th, 2014, the e-harbours final conference will be arranged. Keep an eye on the website eharbours.eu or sign up for the newsletter online to receive the invitation as soon as it is released!

Showcase: Scalloway, United Kingdom. Pure Energy Centre.

Energy matters in small and medium harbours

The Pure Energy Centre (PEC), as part of the e-harbours project, is working on the Scalloway Harbour Showcase located in the Shetland Islands, United Kingdom. The challenge for the Pure Energy Centre Team was to devise a universal harbour energy monitoring strategy.

Scalloway Harbour, the Shetland Islands

The strategy aims at reducing both financial expenditures and CO2 emissions while increasing energy efficiency as well as green technologies in a harbour setup. The aim was also to introduce advanced e-mobility, smart grids and other e-based technologies such as remote energy monitoring systems to the harbour stakeholders. The final objective was to help harbour stakeholders understand the energy issues and the possibilities of advanced energy technologies.

The Pure Energy Centre devised an innovative energy monitoring strategy. The rationale being that energy costs form one of the highest operational expenditures for small and medium harbours. Thus, the ever increasing cost of electrical energy for processing and heating can bring harbours all over the North Sea Region into great financial difficulties.

The application of the strategy showed that the use of a smart grid can potentially provide benefits for Scalloway harbour and could be applied to other European small to medium harbours. It was found that the Distribution Network Operator (DNO) should be fully involved in the implementation of a smart grid solution. In Shetland Islands, plans are currently being implemented by the DNO to establish a smart grid through the North Isles New Energy Solutions (NINES) project. It is hoped that once this has been setup, the benefits that smart grids can bring will be implemented in Scalloway harbour.

Historically and in the Shetland islands, it has always been a great challenge maintaining and managing grid stability, and inclusion of increasing quantities of renewable energy systems has made it even more difficult. In fact, it is now extremely difficult to connect a renewable production system to the grid. This provides a compelling argument for the implementation of smart grid technologies in the Shetland Islands.

As part of the strategy, we produced energy profiles of the different Scalloway harbour entities, and installed a multitude of advanced data loggers. The PEC team logged and analysed the harbour's data for over a year. In addition a series of meetings with the harbour stakeholders were held where energy bills and harbour energy profiles were discussed. From this a clear picture of the harbour energy consumption and the possibilities for Demand Side Management were achieved. Meanwhile the energy awareness of Scalloway harbour's companies increased.

Furthermore we identified a number of key issues that could be addressed to reduce the energy expenditure of the principal energy user in Scalloway. Addressing these issues could be achieved through the implementation of a series of recommendations. Some of the recommendations included the installation of a photovoltaic system at one of the Scalloway Harbour Stakeholders, the reduction of the use of standby equipment, the reduction of equipment starting up times and the set up of a new energy efficiency internal policies and procedures. The PEC energy strategy produced can be rolled out to all small to medium harbours but recommendations need to reflect what is technically feasible in each individual harbour area.

By applying measures like these, the harbour could save £33,000 per year from a capital investment of £340,000. This means there would be a 10 year payback period and by following these recommendations, harbour stakeholders have the potential to become more profitable, and create more jobs and wealth for the local community.

Data loggers installed at Scalloway Harbour

Elizabeth Johnson, from the Pure Energy Centre, states: "the financial implications and the savings that are possible within the Scalloway Harbour show that smart grids, renewable energy and other e-mobility products are the way forward for harbours. If applied correctly, these technologies can provide substantial savings, thereby allowing for harbour businesses to become more financially sustainable. We would urge all EU NSR harbours to apply the PEC's energy monitoring strategy to identify opportunities for energy reduction, increased financial viability and job retention".

In conclusion, the application of simple measures in any harbour can lead to savings. If Scalloway harbour was grid connected to the mainland United Kingdom, the implementation of new e-technologies such as smart grids would have been easier, and thereby lead to a much higher return and wider application of renewable energy. To conclude: smart grid technologies are crucial to harbours and easier to implement in a grid connected setup, if a lot of flexibility is available.

Showcase: Antwerp, Belgium. VITO and Port of Antwerp.

Demand response beyond e-harbours: Spin offs in the Antwerp harbour

For more than 3 years VITO has been searching for energy flexibility in the port of Antwerp. Lots of interviews and meetings were organized resulting in interesting discussions and eye openers for all stakeholders, the VITO team included! The original discussions were with the companies itself but soon electricity suppliers, local grid operators and the transmission grid operator got involved, multiplying the impact of our debate. This contributed to the "scientific result" of the Antwerp showcase as written down in various e-harbours reports and deliverables which are considered important objectives for the project.

The impact of e-harbours, however, is significantly more than project objectives and deliverables! While "smart grids" and "demand side management" are considered quite theoretical concepts, telling a practical story about 5 real companies transforms theoretical concepts into something tangible: Real companies, with recognizable activities which can save money with energy flexibility … and that opens doors!

Although the official e-harbours company surveys are finished and documented, VITO is still cooperating with 3 out of 5 companies in order to guide them towards an actual implementation. At Amoras, the practical organization and social impact of local wind balancing will be investigated and VITO helps searching for ways to take barriers away. For another company, the expert meeting resulted in serious interest of the transmission operator for primary reserve capacity at the demand side resulting in an open discussion for future products at the transmission grid operator. A presentation of e-harbours results on a symposium resulted in an energy supplier which is interested to cooperate on finding a business case for local wind balancing. One of the e-harbours companies will be used as a practical example in order to find a situation where both the energy supplier and the company benefit from the available flexibility. In the meantime, the plans for a big wind farm in the Antwerp harbour are getting more

Amoras is one of the participating companies in the harbour of Antwerp

and more concrete and the local grid operator is worried about the grid capacity. Today, the grid operator is interested in the e-harbours results because smart solutions might solve this problem.

Thanks to the e-harbours project, the Antwerp harbor and the contributing companies, VITO was definitely able to make a step forward in its "hands on" expertise in the identification and valorization of flexibility resulting in fine tuning "Demand Response Audit" services. Also outside the e-harbours project VITO helps companies in finding a sound business case for the present energy flexibility.

Today, VITO helps Febeliec (Federation of Belgian Industrial Energy Consumers)and Elia (the Belgian transmission grid operator) with a survey on the potential of demand side flexibility in the Belgian industry as an alternative for a new subsidized gas power station. Reusing the experience of e-harbours on a bigger scale: A nice spinoff from e-harbours … beyond e-harbours!

Showcase: Amsterdam, Netherlands. City of Amsterdam.

Amsterdam studies the case for electric canal cruise boats:

Towards emission-free boating on the canals

Like other cities all over the world, Amsterdam is fighting to improve the air quality in the metropolitan area. One of the focal points of the Municipality is to make boating cleaner and greener. No less than 14.000 leisure boats sail the city waters, and about 175 professional canalcruise boats cater for the tourists that want to make a roundtrip through the canals.

In a recent policy document (de 'Nota Varen', or 'Boating Report'), Amsterdam states that it wants leisure boating on the city waters to be completely emissionfree by 2020, and the professional fleet by 2025. With this goal in mind the Air Quality Department of the Municipality of Amsterdam is looking for ways to implement electric boating. Given the large scale of boating in Amsterdam, the transfer to electric boating is interesting for the e-harbours project. Apart from the fact that it has a direct influence on the air quality in Amsterdam, expansion of the electric fleet can contribute to flexibility of energy use (an important asset for smart grids) in the long run.

The Amsterdam showcase of e-harbours has been investigating the technical, economical and business possibilities to reach emission-free boating. A recent expertmeeting around this theme showed that for smaller boats, electric motors provide an excellent solution. For big boats, like the canal cruisers, the story is much more complicated.

At the expert meeting, the cruise company Canal showed the results of their pilot to meet the European Phase III b-norm by treating the exhaust fumes of the diesel motors. But that outcome is, as researchers of Dutch Technology Institute TNO remarked, very dependent on the way the motor is used in daily practice.

In the meantime, electric boating is gaining popularity, also among canal cruise companies. The advantages are clear. As one of the experts (a specialist on watertourism) stated: "Apart from the zero emission (air quality), the fact that there's no noise, makes dinners on board, music and speeches more attractive. Furthermore electric boats do not smoke and stink, which contributes to a sustainable and innovative image."

Erik Regterschot, City of Amsterdam

An increasing part of the professional cruise fleet is electric now: all the sloops that can be hired, and roughly a third of the smaller cruise boats (the so called saloon ships). But of the big canal cruisers, at the moment only three boats are zero-emission. The problem is twofold: these big ships demand very extensive battery packs. And even then, their range is too limited. A standard commercial cruiseship on the Amsterdam canals will (in high season) be in action 14 hours a day. That can not be realised with the current generation of battery packs. For this reason, experts from technology institute TNO predict that the near future for large canal cruisers will lie in hybrid electric systems.

Showcase: Malmö, Sweden. City of Malmö.

Are households prepared to change their energy behavior?

”Consumers have to adapt their own behavior to make a more sustainable energy system possible”
Photo: Christian Andersson for E.ON

The eight smart apartments in Malmö received their first tenants in April. We interviewed Per Rosén from Business Innovation Department at E.ON Sweden AB on the connections between technology and behavior in smart homes.

E.ON, one of the biggest suppliers of gas and power in Europe, has built a block of ‘smart homes’ in the Western Harbour area of Malmö. Eight apartments are fitted with state-of-the-art energy technology (like a small wind turbine, photovoltaic, boilers fuelled with biogas, and heat pumps). Four of the apartments are also connected to the district heating system of Malmö, that serves as a backup, and can accommodate excess energy when the apartments produce more than they need. The apartments incorporate smart energy systems, that provide the tenants with real time information, not only on current energy production and consumption in the house, but on the energy prices in time-slots.

What are the first experiences with the smart homes?

“The tenants moved in April 1st,” says Per Rosén of the Business Innovation Department at E.ON Sweden AB, “that marked the beginning of our three-year test period. Of course, we have only just begun. To start with, we found out that the communication between

the many energy-related systems in the apartments is a complicated matter. It is like one system speaks English, the second German and the third Swedish. They understand each other only partially. But we will work that out."

How do the tenants react to the different possibilities supplied by the information system in their home?

Magnus Lindström, E.ON, explains the user interface where the tenants can control their energy consumption and production via an iPad application.

Per Rosén: "In the end, this is what smart energy systems are all about. In the Western world, we have got used to an energy system that simply delivers energy when there is demand for energy. Now we are moving towards a system where we consume energy, when there is supply. Up till now, the consumers could point towards the energy providers, and say: deliver the energy when we need it, and don't forget, make it more sustainable too. But now we all have to realize: when you point one finger towards someone else, three fingers keep pointing in your own direction. Consumers have to adapt their own behavior to make a more sustainable energy system possible."

"We hope, that households will become more aware of the importance of energy matters. Perhaps the biggest advantage of PV-systems on the roof of all those private homes is not that they produce energy, but that they raise the energy-awareness of the owners."

"In the Malmö apartments, the tenants get information about the price of energy in different timeslots in the next 24 hours. When the price is very low, that should be a signal to switch on energy consuming devices, for example, start charging the battery of your electric car. Of course, we do not prescribe tenants how they should behave. We can give them suggestions, but it is up to them to make choices according to their own priorities. They can say: I want the dishwasher to start now, regardless of the current energy price. But they can also ask the system to start devices only when the prices are low. The big question for us is: are households really prepared to accept some decrease in comfort levels, to make the energy system more sustainable? We hope for a positive reaction of the households. The tenants are enthusiast about the houses and the smart system, and we hope it will really change their energy behavior. Otherwise, we all face a problem."

E.ON has a program of pilots on smart energy systems in different European countries, called Thinking Energy. More information: http://www.eon.com/en/sustainability/regional-activities/sweden.html

e-harbours electric

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, DE
Pure Energy Centre, UK
Robert Gordon University, UK
VITO, BE

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

More on e-harbours

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- 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: September 2010 - February 2014
- Website: www.eharbours.eu

Production: Daniel Skog, City of Malmö, Oct 2013

The Interreg IVB North Sea Region Programme
Investing in the future by working together for a sustainable and competitive region

Hochschule für Angewandte Wissenschaften Hamburg
Hamburg University of Applied Sciences

pure ENERGY CENTRE

City of Amsterdam

Malmö stad

vito vision on technology

ROBERT GORDON UNIVERSITY·ABERDEEN

Port of Antwerp

ZNSTD