

## EnergyLab Nordhavn Annual Seminar 5 September 2017

On 5 September more than 50 project participants from EnergyLab Nordhavn met at the premises for the new showroom in Nordhavn.

### Part one – morning

The morning session included a brief status from each of the work package leaders, a short introduction to the latest report from the Danish Energy Commission from Professor Jacob Østergaard as well as three parallel workshops.



The workshops concerned “Visual communication of the integrated smart energy demonstrations in EnergyLab”, Facilitated by Per Nørgård, DTU; “How to utilize the flexibility in the district heating network”, hosted by Kristian Honoré, HOFOR and "From BAU (business-as-usual) to disruptive business models in Nordhavn" facilitated by Professor Pierre Pinson, DTU.

Below is a short resume from each of the workshops.

### Visual communication of the integrated smart energy demonstrations in EnergyLab, Per Nørgård ([pern@elektro.dtu.dk](mailto:pern@elektro.dtu.dk))

The discussion was based on input from participants regarding their wishes for the visualizations. It was clear that a distinction between external communication and internal communication is needed. In other words, the visual tool presented at the workshop is first and foremost a tool to support Work Package 8 for integration of the energy systems across hardware installations. Therefore, focus will be on internal communication to simulate the integrated project development, by bringing down disciplinary silos.

A few of the comments from participants can be seen here.

- Need of reaching residents/citizens and politicians – in simple very overall visuals.
- Scenarios of min/max production (input), and min/max consumption.
- Take a look on the Bornholm EcoGrid models at DTU for inspiration.

- It is important to understand the difference between the two Work Packages – WP9 and WP8. WP9 (task 9.4) is primarily focused on generating an overview of how the system works on an overall level and where WP8 (task 8.2) is all about boosting an integration between the energy systems and components installed.
- Target group of WP9 is citizens and politicians
- Target group of WP8 is technicians (R&D engineers)
- Right now the ELN project need to show results before working on lots of communication, therefore tools for boosting internal communication is strongly needed to build bridges and efficient communication between partners.
- From experience, complex R&D projects need to break down silos to generate strong and integrated results.
- I am of the opinion that the visualization will serve very well to work on system integration. Presentation as the small image series for the fuelsift containers is, in my opinion, right for this use.

### How to utilize the flexibility in the district heating network, Kristian Honoré ([krih@hofor.dk](mailto:krih@hofor.dk))

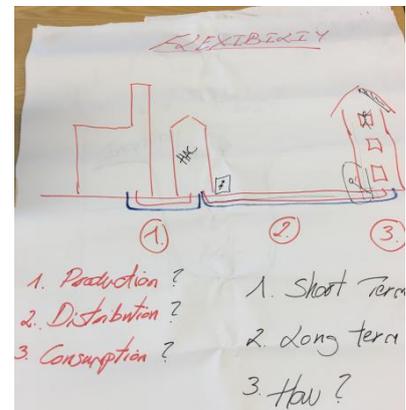
On a short term basis the intention of flexible customers in the district heating network is to eliminate the use of fossil fueled peak load boilers. It is desired by HOFOR, if possible, to utilize the flexibility in the district heating network further to offer new services in the future, also following the “post- biomass era”- i.e. a service that might help relieve the electric grid. The purpose of the workshop was therefore to get valuable input on what these services might be- and how one might go about to make this happen.

Below, the suggestions from the participants of the workshop is presented in bullet points.

1. Short term- eliminate the use of fossil fueled peak load boilers

#### How?

- New business model to target 3 main customer segments
  - o Affordable
  - o Green
  - o Secure
 } and **comfortable energy**
- HOFOR commissioning → optimize capacity of heating central, and radiators etc. in apartments
- Intelligent controller of heating systems in buildings → avoid miss use of systems by customers
- Dynamic tariffs → monthly- vs. hourly basis
- Fuel shifting in DHW tank → electronic heating element installed in tank



2. Long term- lowering of the return water temperature to the system and BIO4 (~50-35°C) to optimize, and increase the capacity of the DH network

#### How?

- Utilize return temperature from domestic hot water tank
  - Heat pumps to utilize heat from return lines
  - Low-temperature district heating (not a mean directly linked to flexibility)
3. Post-Biomass era: - As previously mentioned the idea was to get inputs on how the district heating network and the electric grid could help relieve one another in the future, unfortunately we did not receive any new input on this matter.

#### From BAU (business-as-usual) to disruptive business models in Nordhavn, Pierre Pinson ([ppin@elektro.dtu.dk](mailto:ppin@elektro.dtu.dk))

The workshop gathered 15 participants, who enjoyed a proactive session to propose, discuss and analyze alternative business models that could be inspired by the case of Nordhavn, but also possibly demonstrated in Nordhavn.

Those business models would focus on energy as a service, multi energy systems and cross-sectorial business models (e.g., with transportation), digitization, and consumer-centric approaches to energy markets. After a general introduction to the work to be done, groups of two or three people were formed, and each group had to propose a business model (or two) in one of those categories, to be further described and analyzed.



Two rounds of group-based activities and general discussion were carried out, in order to present the work and ideas to the other groups. Each group was given an assignment to look at actors involved, link to regulation, etc. in order to assess whether their business model was more linked to a business as usual case (in a sense, readily deployable) or more disruptive. The various groups came up with a number of very interesting ideas, e.g., related to energy communities, cloud-based management of community storage, providing thermal comfort in building as a service, etc. All those business models were described on large post-its, with photos shared jointly to this post.

#### Part 2 - afternoon

Following the first set of workshops the group was ready for lunch. The venue and weather allowed participants to go explore the area or stay and discuss with colleagues in the showroom.

Following lunch the group split in two. One group went to Sundmøllehusene to learn more about the ABB KNX installations and the advanced measurement possibilities while another stayed at the premises to learn more about the status of the showroom and the EnergyHub .

After that another round of workshops started. These three workshops concerned “EnergyLab Nordhavn data and metadata”, Christian Brandt Rasmussen, Software team leader, CEE, DTU; “Integrating flexibility into the long-term energy planning”, Sergey Klyapovskiy, PhD student, CEE, DTU; “Nordhavn as Innovation Arena for SMEs “, Jakob Stolt, Climate-KIC/Cecilie Ena Lise Pedersen, Copenhagen Solutions Lab/København Kommune.

Below is a short resume from each of the workshops.

## **EnergyLab Nordhavn data and metadata”, Christian Brandt Rasmussen**

The overall data-warehouse system with focus on the data model was described for the workshop participants comprised of researchers, phd-students and some of the project’s industrial partners. They were split in four groups given the task to suggest a way to organize a shown set of data, built upon the data model, and to give comments and suggestions in the end of the workshop. Comments and suggestions from the participants are organized in the following.

### **User interface for data browsing and extraction:**

- Possibility to choose data resolution and method of averaging for high resolution datasets.
- Create own datasets within the user’s domain.
- Visual depiction of the graph surrounding a chosen dataset. Possibility to adjust depth of the representation. It should be possible to select others shown datasets and thereby make them center for the graph representation. This could be a way to explore datasets in the system.
- Possibility to add drawing, pictures, maps etc. Some elements, e.g, the sensors installed. This is not part of the plan for the system for now, but definitely a possible addition for the coming versions of the UI.

### **Data model**

- Find ways to half-automate the process of generating datasets by e.g. adding short of hash-tags or similar to low-level first instance datasets containing the fast data references to measurement or data source points. This would give something to filter upon.
- Most suggestions for organization of data was based on the physical connection and placement as e.g. Building => Apartments => Measurements etc.

### **Meta-data**

- Several standards exist for describing meta-data within a certain area as e.g. buildings. Suggestion is to use these to ensure a uniform and reliable implementation. The data model does not hinder such implementation, but it requires someone with specific knowledge about the specific standards and access to the relevant meta-data. Suggestion is to add this type of meta-data on request by locating necessary knowledge within the field.

### **Integrating flexibility into the long-term energy planning, Sergey Klyapovskiy ([seklya@elektro.dtu.dk](mailto:seklya@elektro.dtu.dk))**

The workshop was focusing on discussing the need for flexibility in the electrical distribution network and how such flexibility can be obtained and utilized. Some of the conclusions and outcomes of the discussion:

1. There is no fixed value for flexibility, as it is location based and depends on the need electric utility has for it.

2. Curtailment can be one of the backup flexibility service (if one of the flexibility provider does not responded).
3. Aggregators should come to the market and form a flexibility service portfolio, so that utilities can deal with limited numbers of market players.
4. Aggregators can use consumers' flexibility, in return they guarantee that the customers will be provided with the pre-defined desirable comfort level at any given time.
5. Different types of customers require different motivation to participate in demand response program (cost savings, helping environment, etc.)
6. The amount of flexibility offered by consumers can be significantly increased by enforcing regulations on equipment, that demand response function is mandatory.
7. In order for electric utility to use flexibility, it should be reliable with predictable behavior.
8. Energy sectors should provide flexibility to each other in order to reach goal 2050 with 100% renewables.

Ideas and suggestions from this workshop can be further investigated to improve the understanding of how different flexibility options can be integrated into the planning of active distribution networks.

**Nordhavn as Innovation Arena for SMEs", Jakob Stolt, Climate-KIC/Cecilie Ena Lise Pedersen, Copenhagen Solutions Lab/København Kommune ([jakob.stolt@climate-kic.dk](mailto:jakob.stolt@climate-kic.dk))**

Successes and achievements in EnergyLab Nordhavn so far – What are we proud of and how to make them even better?

The workshop was planned to make the participants – all with partner involvement in EnergyLab Nordhavn – present information and stories of successes and achievements in EnergyLab Nordhavn that can be shared with others (start-ups and SMEs (small and medium-sized enterprises)) and preferably to make things even better.

The aim was to start the process of identifying relevant knowledge and results that in the sub-project Nordhavn as Innovation Arena for SMEs can make way for these results to be either developed further or taken into consideration and action for establishing start-ups involving the product/knowhow in hand, thus creating value for the overall project (EnergyLab Nordhavn), the start-up in hand or other ways of generating value of this knowledge transfer.

The participants gave valuable examples of what achievements to look into, and the workshop organizers also received valuable insight to the project's different areas that can make way for a clustering and the-matization of the project's many working areas. This will make the coming matchmaking between EnergyLab Nordhavn-knowhow/results and relevant start-ups/SMEs more tangible.

It was stressed that all project partners are welcome to deliver more examples of useful data, results, knowhow etc. that could be relevant and value-adding for both the project and potential start-ups. Please use the form below or write an e-mail to Senior Project Manager Jakob Stolt, Climate-KIC.

As the last part of the agenda the project had invited Jesper Malm, Thought Leadership practitioner to give a short presentation about how other companies in both Denmark and internationally work with the concept Thought Leadership. The presentation allowed us to consider how to use thought leadership in EnergyLab Nordhavn – how do we present ourselves as the number one smart city project in Copenhagen, Denmark and not least internationally.

Before parting it was time for a glass of wine and a few snacks. We appreciated seeing so many of you there and hope you enjoyed the day as much as we did.