Off Grid Test Center

Wim Joosten: OGTC

Lille, 15 November 2019

- Content
- **Project: lessons learned**
- **Project: development last period**
- Results
- Live demo tools
- Next steps / end game

Project: lessons learned

The journey of the project

During the project OGTC was not able to realize the site in Den Oever and founding partners terminated the partnership.

But … These were not the reason for the bad performance in the (beginning) of the project. The main reasons were:

- **OGTC did not put enough effort in the project**
- **OGTC could have been more pro active towards partners**
- **OGTC did not give the support partners asked for**

Content

Project: lessons learned

Project: development last period

Results

Live demo tools

Next steps / end game

Development last period
High level overview activities

May
June

- Update needs ‘users’ / stakeholders
- Evaluate and detail available info within project (contact IfaS - Aquatera)
- Gather and assess available tools and info ‘outside project’

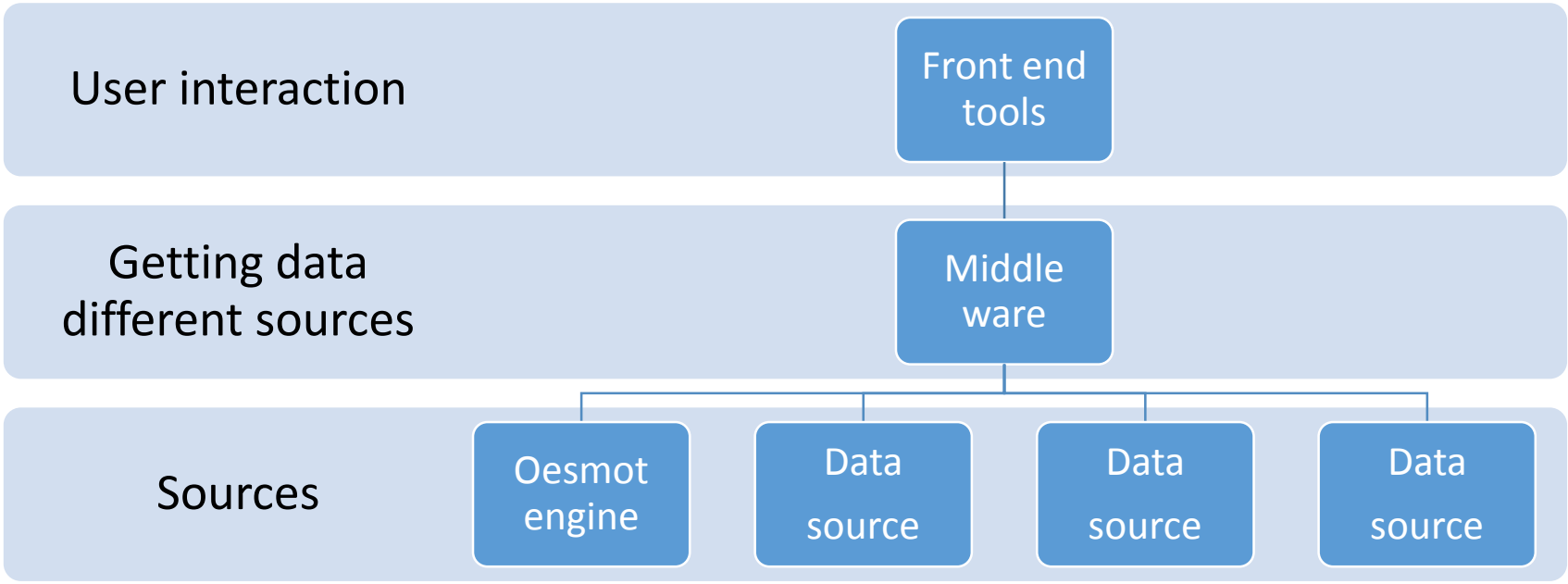
July
August

- Test & select tools & data sources
- Define functional requirements / first tests

September
Oktober

- Develop tools and deliverables
- Test & check tools and deliverables

Development last period
System architecture



Some of the sources used:
https://re.jrc.ec.europa.eu/pvgis.html
https://data.nasa.gov/
https://www.worldbank.org/

- Content
- Start
- Development
- **Results**
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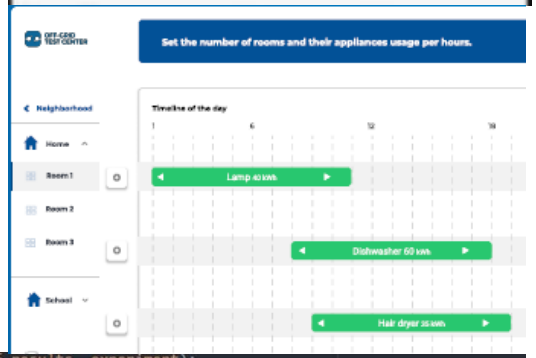
Results

Easy to use tools to get a first idea about a DHES

Tools & monitoring deliverables

- Energy evaluation-, modeling- and simulation tool (own development)
- The site assessment / optimum energy mix tool. Based on Ifas input and the Open Source oemof tool for modelling and analysing of the Reiner Lemoine institute
- Two video tutorials are made to explain the tools and to create traffic to the website



Modeling tool oemof v0.3.0 released

REINER LEMOINE INSTITUT

oemof ['ø:məf]

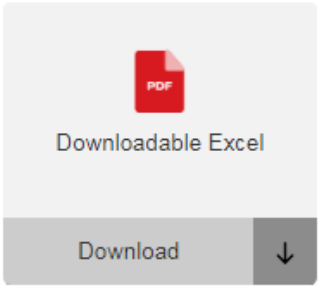
```
def project_annuities(case_dict, oemof_results, experiment):
    # Define all annuities based on component capacities (Capex+Opex), add var. operational costs
    # Extrapolate to costs of whole year
    economic_evaluation.annuities_365(case_dict, oemof_results, experiment)

    # Add costs related to annuities
    economic_evaluation.costs(oemof_results, experiment)

    # Expenditures for fuel
    economic_evaluation.expenditures_fuel(oemof_results, experiment)

    # Expenditures for shortage
    economic_evaluation.expenditures_shortage(oemof_results, experiment)
```

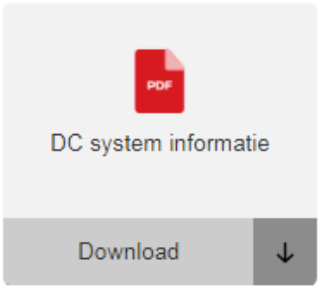
Results

Documents that give a high level insight

Implementation - Evaluation - Acceleration of DHES

- Roadmap for a DHES with relevant details per ‘development step’
- Checklist for DHES project
- Project survey document for a DHES project
- Overview available DHES tools
- Proposal for publication (agenda). Next year OGTC will provide Regional DHES community with "content" regarding DHES





All the documents can be downloaded on the OGTC websites

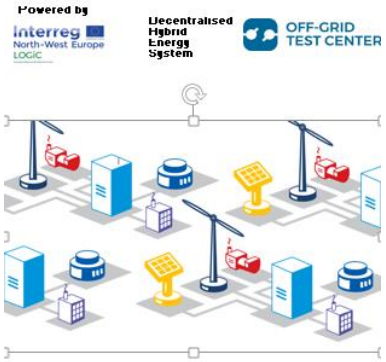
The documents give an high level insight with respect to the subjects

Results

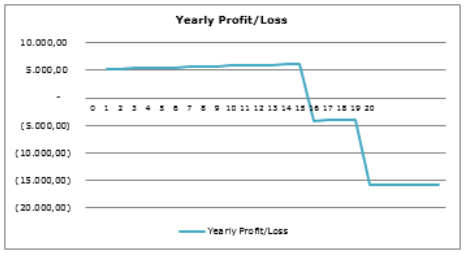
Cases based on available location information

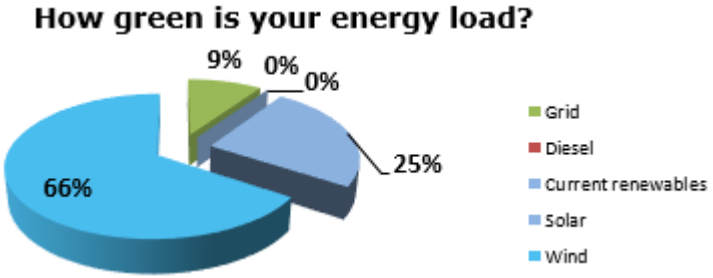
8 Blue print business cases

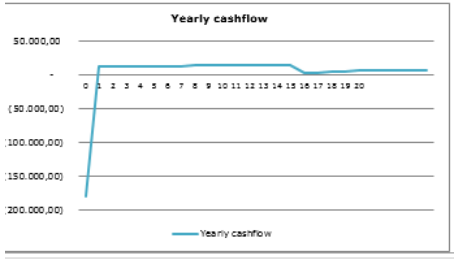
- Functional design for 8 locations
- Financial design for 8 locations
- Financial model
  - –Excel model that calculates the business case
  - –P&L for a DHES project



Blueprint I 50 households

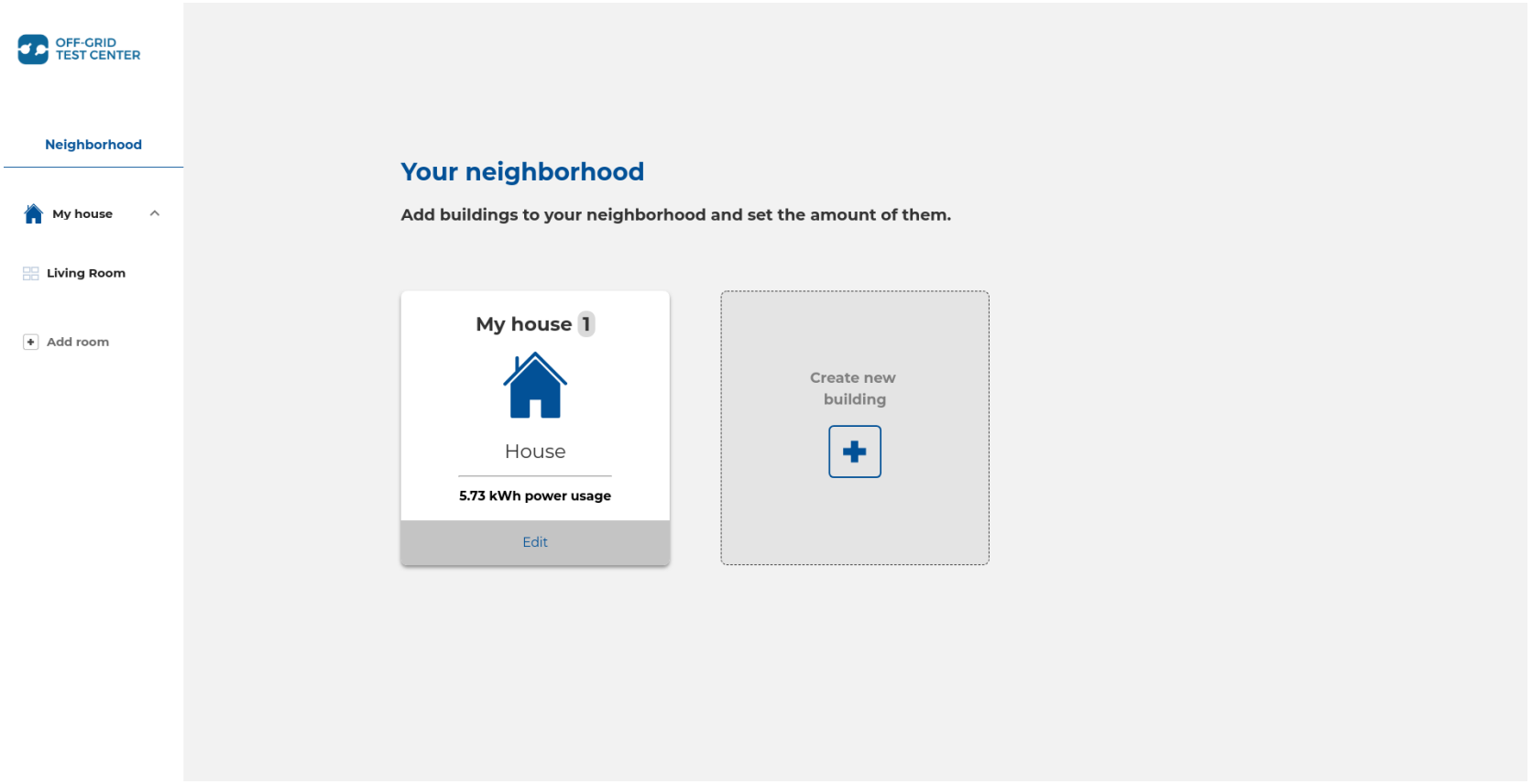






Results

Online tool: what is the energy need



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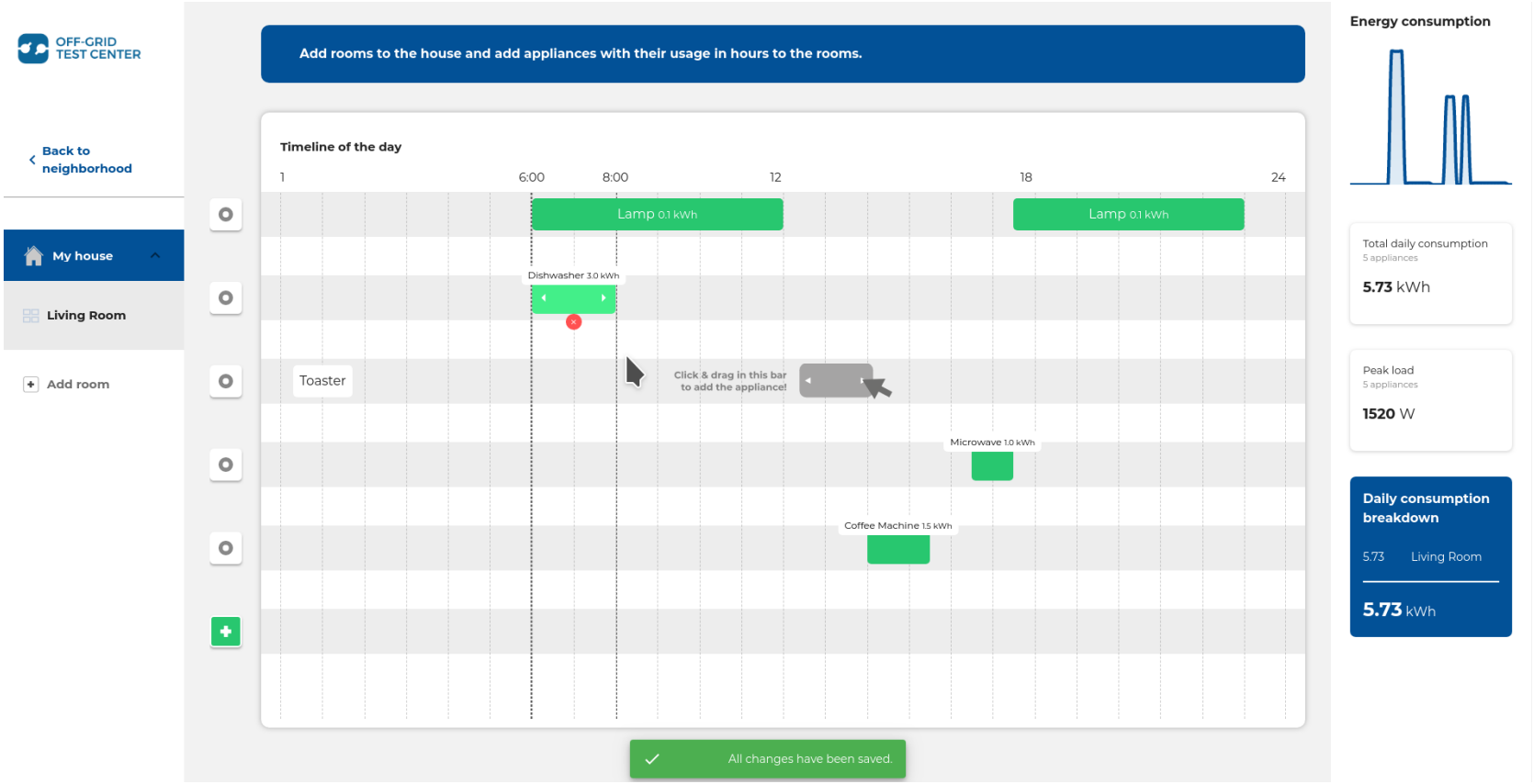
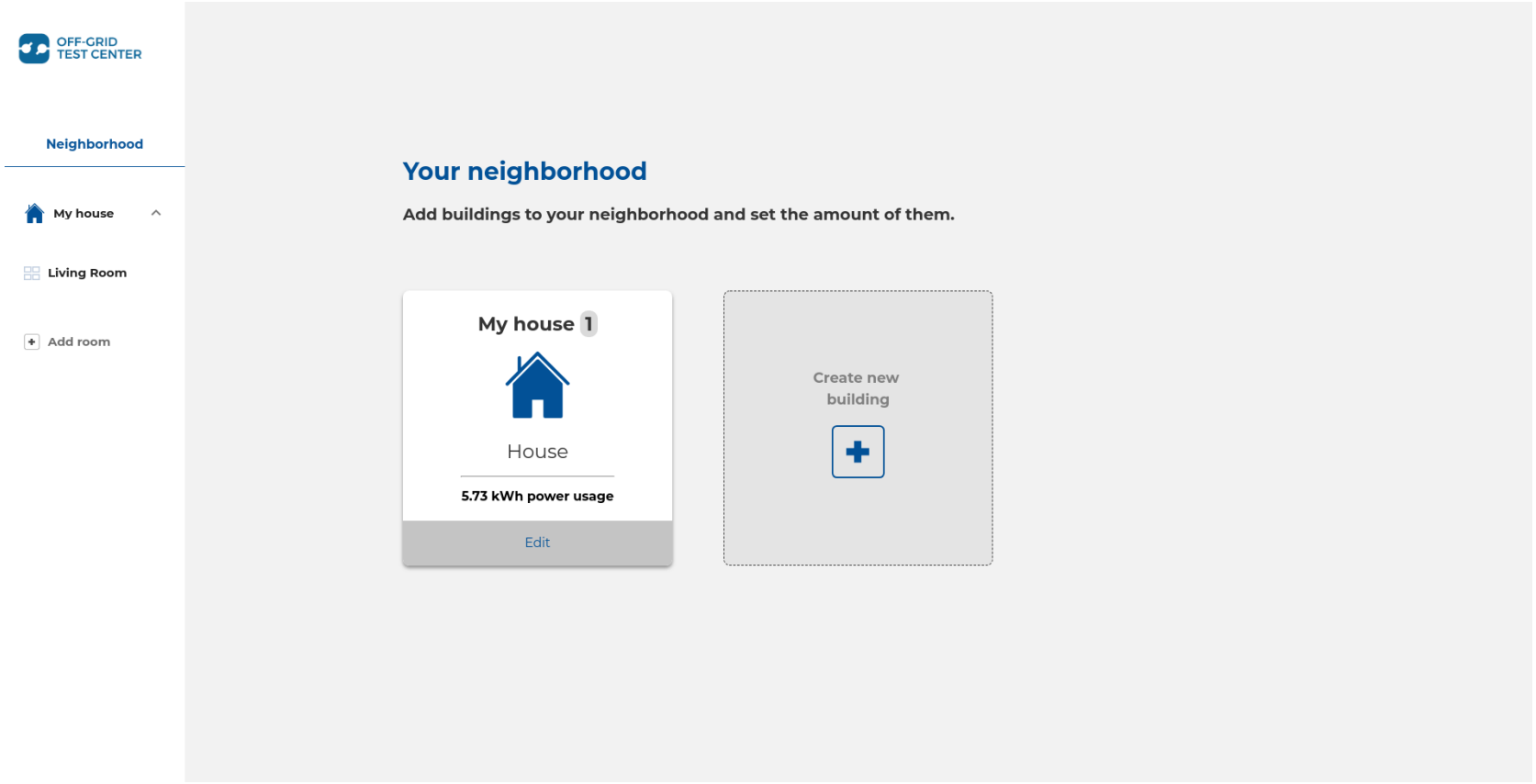


Results

Online tool: assessment of the location



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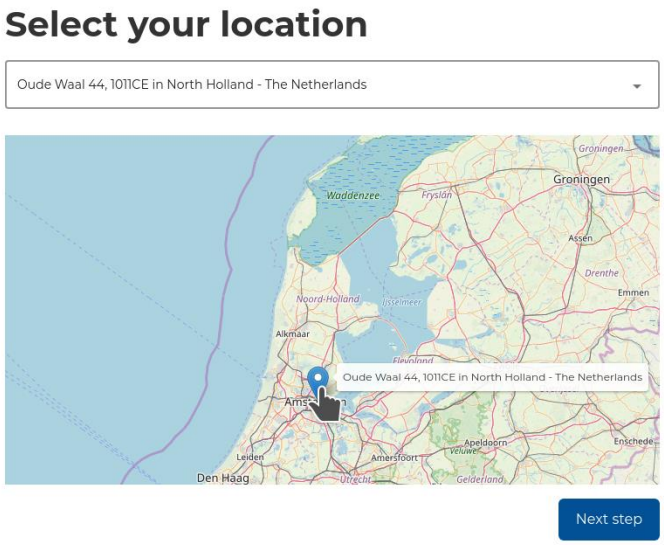

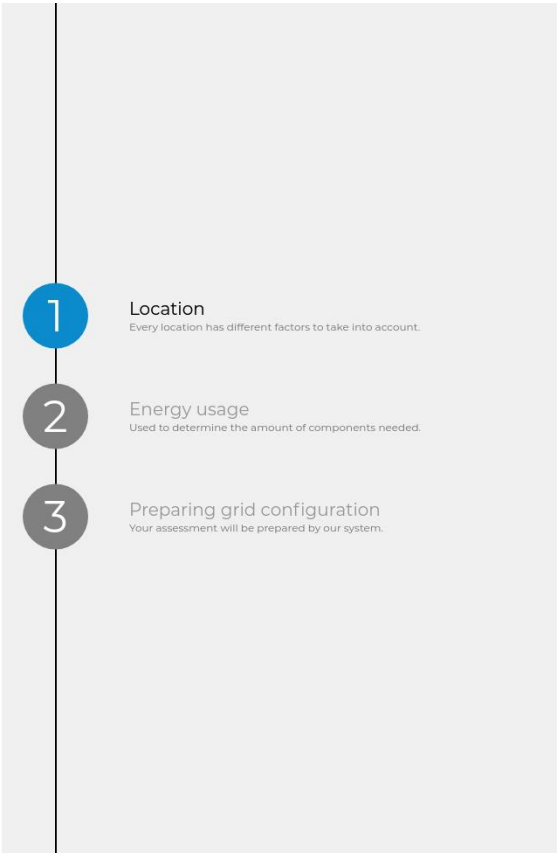

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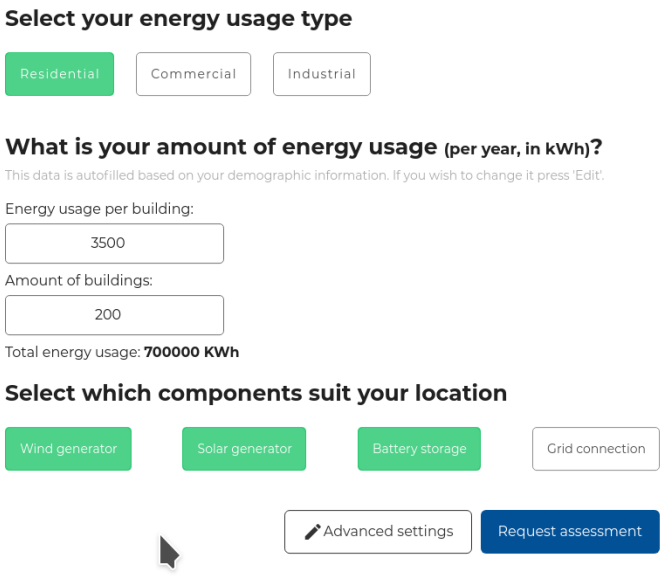

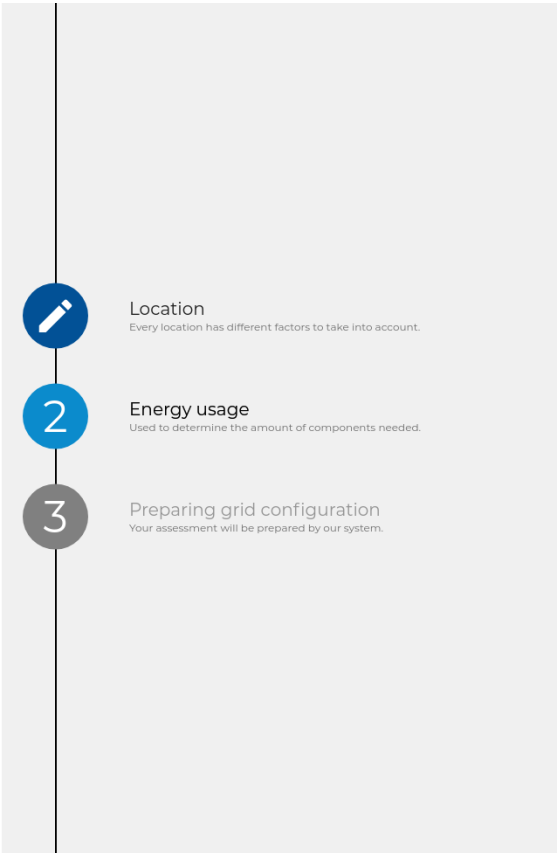

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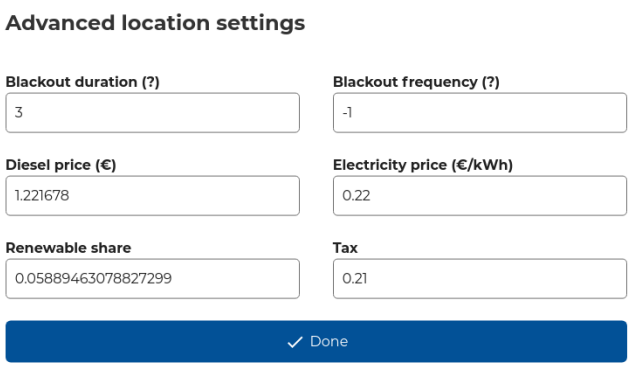

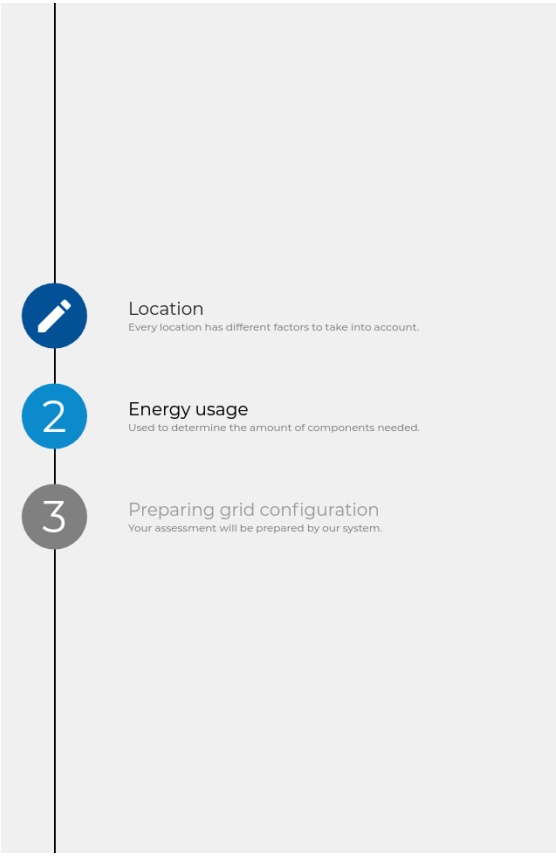

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- **Live demo tools**
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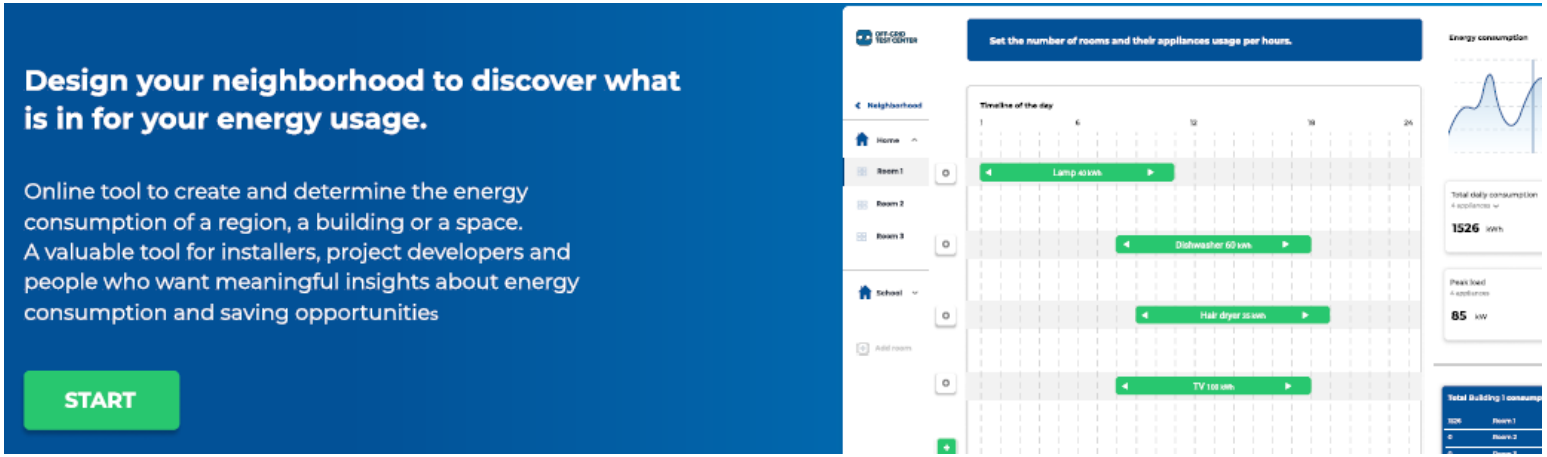
Results

Online tool: live demo



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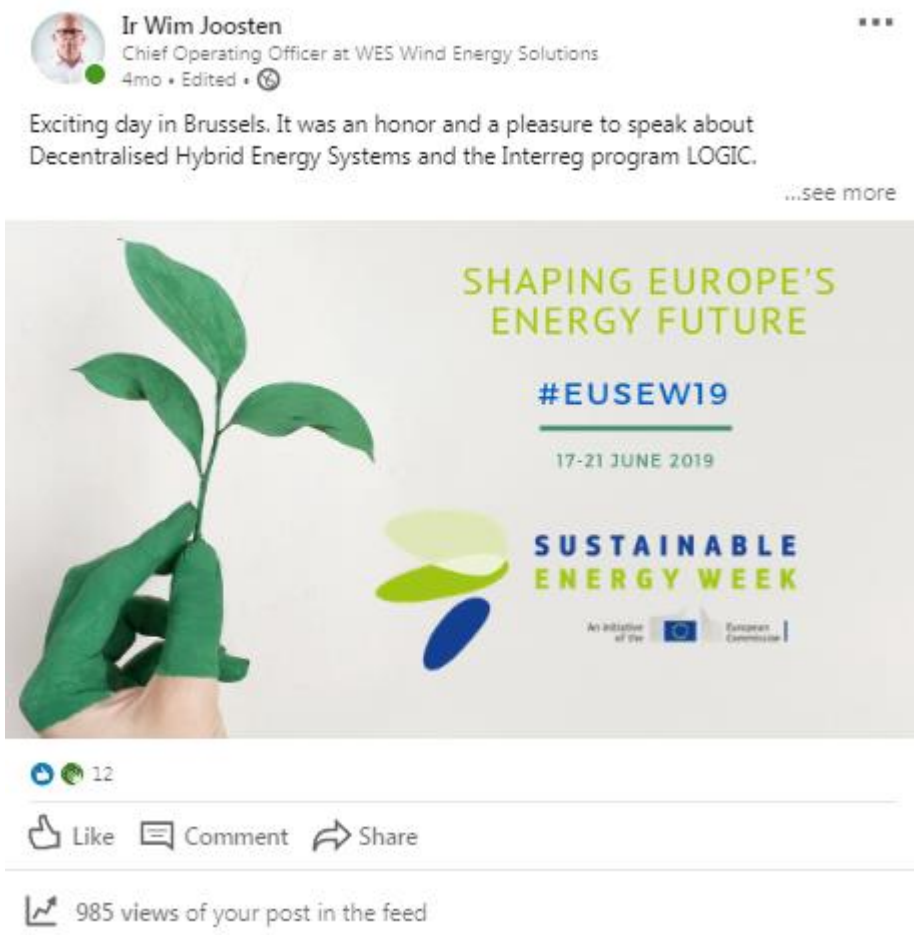
Sharing information now and in the future

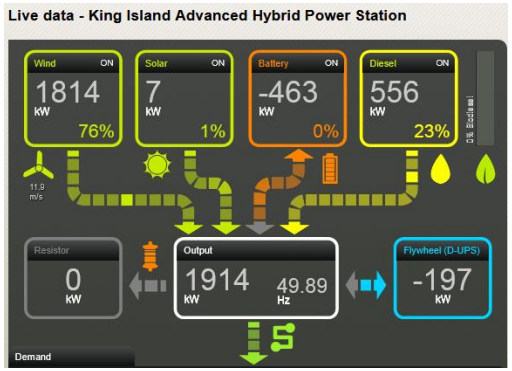
Brussels Energy week and local events

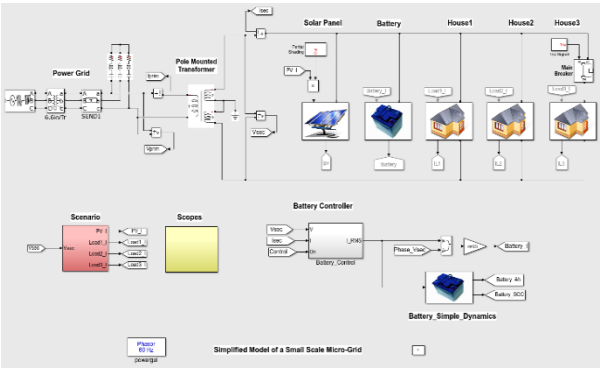


The DHES concept is presented during several local events and during the energy week in Brussels. Focus during the presentation on the impact of a DHES and possibilities in the future with a growing group of possible users.

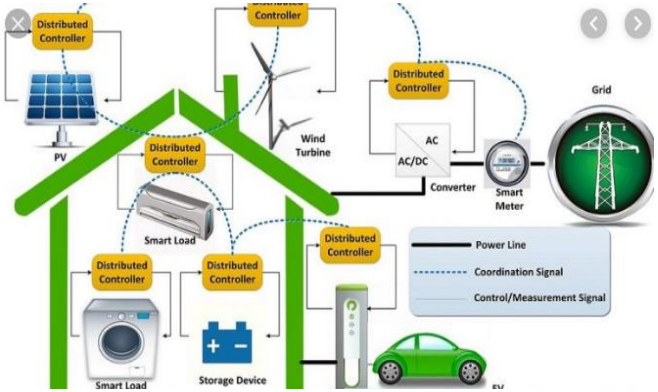
Next steps

Sneak preview current development





In process: a DHES / microgrid digital simulation room and a demonstration and simulation container in Alkmaar



Next steps

Sneak preview end of 2020: center in Den Helder

- Real-time / real life (no simulation | the grid stability is tested)
- To demonstrate the working of a microgrid but also to test parts of the grid / components
- Energy management system + Energy measuring system
- Focus on storage: e.g. H2 and O2 production
- Carry out a test for partners > testing batteries, solar panels, inverters, etc.)
- Various "recipes" for test scenarios (e.g. extreme situations)
- Deliver real-time data and analysis
- With the Port of den Helder and local government, OGTC explores the feasibility

Next steps
FleXtore project / Elestor

- The goal of this project is to arrange the basis for a scalable energy storage system based on the **Hydrogen Bromine Flow Battery**
- Partnership with • Witteveen+Bos • TNO • HAN • Stichting Pioniers van de Toekomst • Gemeentewerf Emmeloord
- OGTC will develop business cases for different scenario's.
- OGTC has developed an Energy Management System made with the 'Node red' tool

Next steps

Tell the world about our tools & services

	Content / promotion Agenda OGTC 2020			
Period	**Q1 2020**	**Q2 2020**	**Q3 2020**	**Q4 2020**
Theme	Load management	Power of data	Making grids smart	Best practices of DHES
Blog	Jan 1th + March 30the	June 30th	Sept 30th	Dec 15th
Presentations	1 Event	1 event	1 event	1 event
Digital campaigns	2x outbound campaign	2x outbound campaign	2x outbound campaign	2x outbound campaign
LinkedIn	3x 'own content' 3x sharing content	3x 'own content' 3x sharing content	3x 'own content' 3x sharing content	3x 'own content' 3x sharing content
Webinar		Webinar 'Power of data'	Webinar 'Making grids smart'	Webinar 'Best practices of DHES'

Next steps

The base: a complementary & passionate team

Wim Joosten
Team Leader

Marien Boonman
Lead Developer

Giulia Bottino
User Experience Designer

Bindu van Raak
Software Engineer

Petra Goudsblom
Project Manager

Mike Groot
Financial Controller

Guido Zwart
Senior Engineer

Stan Bankras
Frontend Developer

Alex Bankras
Frontend Developer

Next steps

Short term and the end ‘game’

OGTC will develop, model and validate DHES solutions for islands and remote location. Using AI and data, we are able to model en simulate.

OGTC wants to be THE source for free information regarding DHES solutions. Information relates to financial and socio demographic aspects.

OGTC will support companies with the development of components / parts for a microgrid / DHES. Both technical development and business development > FleXtore project

Next steps

Develop partnerships, which program can we join

OGTC is invited to pitch the 'Energy Awareness Tool' next week in Antwerp at the Northern Connections Living Lab Event G-STIC Conference in Antwerp.