

**Tagline**

# Feasibility study Vlissingen

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Super Smart Charging Hubs

# Deliverable WP2 2.2 Feasibility Study

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# Current situation on site

De Machinefabriek building is currently being rebuild into a multifunctional building which will include offices, a library, an event location and a parking garage. The transformation of this building should be finished by the end of 2027. The parking is operational 1/2 2026.

Municipality of Vlissingen will become the owner of the building and PV panels and will operate the parking.

The charging facilities will be owned and operated by Agri-GO.

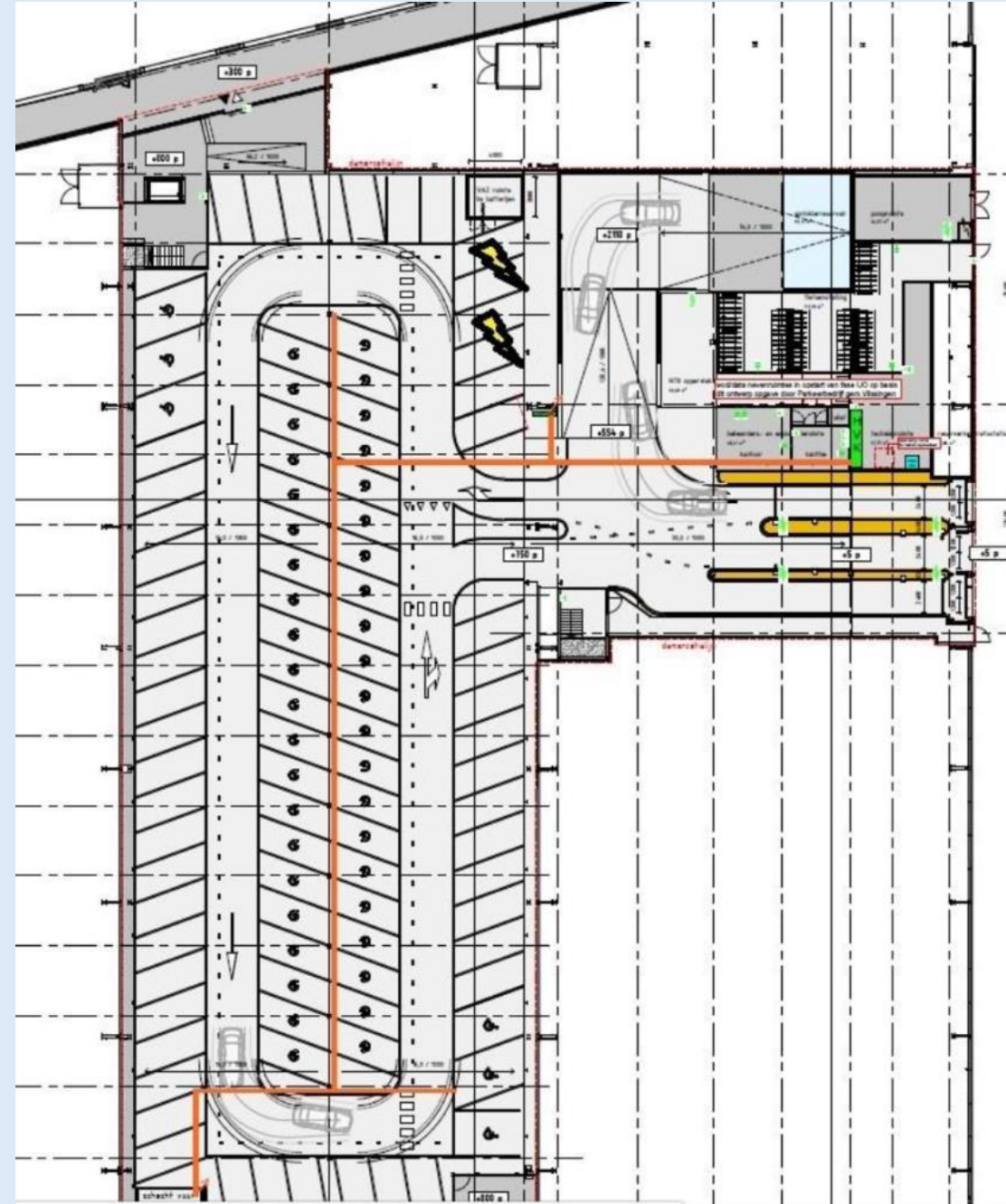




# Envisioned situation on site

## A SSCH with:

- 40x bi-directional AC charging points
- 4x 50kW DC charging points
- Solar panels 55 kWp
- BESS 230kWh/125kW



# Charging needs – Stakeholder groups

- Parking garage "De Machinefabriek" will host 625 parking spots
- Brussels University estimates 10% will be EVs
- This can be more;
  - Company DAMEN (250 spots) will park during day-time.
  - DAMEN foresees fast growth in EV's
- Carsharing company OnzeAuto wants to involve (few) bi-directional EV's
- Guests of hotel "De Timmerfabriek" will park.
- Inhabitants of nearby apartment buildings will park day and night
- Tourists visiting Vlissingen city and boulevard park during daytime



# Charging needs – Stakeholder groups

- Stakeholders are: local companies, users of De Machinefabriek, inhabitants of Vlissingen, tourists, hotel guests of Hotel de Timmerfabriek, car sharing company
- Most EVs stay minimum half a day in the garage.
  - Long stay charging with 40 22kW AC charging points
  - Short-stay visitors (max. 2 hrs) 4 50kW DC charging points
- Stakeholdermeeting will be held at 23rd of september



## Energy supply – Current situation

- De Machinefabriek has a grid connection of 630kVA. This connection is used to supply the whole building. 3\*300A (207kW) is available as input for the SSCH.
- On the roof, the Municipality of Vlissingen will install 55kWp of solar panels.





# Energy supply – Potential

## What could be build?

- The roof construction limits the installation of solar panels. A maximum of 120 solar panels can be installed. These will produce 55kWp



# Scenarios for a Super Smart Charging Hub

## Build-up of scenarios

- **Ambition level**
- **# Charging points**
- **# vehicles**
  - shared,
  - private,
  - corporate
- **Connection type**
- **Feasibility & preconditions**

Phase 1	Phase 2
Safe	
44	88
2	4
30	90
5	5
Type 2 + CCS	Type 2 + CCS
Sufficient use of the infrastructure is necessary to move to phase 2	



# Energy demand – Scenarios

Brussels University identified four possible scenarios based on the penetration in % of EVs. The scenario with a 10% penetration is supposed to be the most likely

- EV penetration rate 5%
- 79.10 MWh
- 4210 sessions
- 110 sessions/year/charger
- EV penetration rate 10%
- 158.19 MWh
- 8427 sessions
- 220 sessions/year/charger
- EV penetration rate 15%
- 241.05 MWh
- 12750 sessions
- 335.53 sessions/year/charger
- EV penetration rate 20%
- 318.35 MWh
- 16923 sessions
- 445 sessions/year/charger



# Energy supply – Scenarios

- Due to the roof construction the installation of solar panels is limited
- Opportunities lay in the installation a battery pack. At the start this battery will have capacity of 233 kWh. It is possible to extend the number of batteries and the total capacity. Depending on the impact of V2G, the capacity of the BESS could decline.
- Process: AgriSnellaad has a dynamic contract for their energy supply. On the middle of the day the energy price is at its lowest. At that moment the energy supply should be 100% from the grid. Only then low prices can be charged to the EV drivers who will charge their car. This also reduces the grid congestion as operator Stedin faces input congestion due to the energy production of solar panels and windmills. During daytime the locally produced solar energy will be stored in the BESS. This energy will be used in the evening and at night. Directly at the moments when Stedin has a problem with output congestion. In this way the SSCH Vlissingen will not have any negative influence on the local grid. See next slide for V2G impact.



# Energy supply – Scenarios

- **V2G:** adding bi-directional cars to the system will provide an opportunity to help the grid operator when they face input congestion, but also in the case of output congestion. During daytime the V2G cars can be charged which will lead to a decrease of this congestion type. During the evening these cars can deliver electricity to the grid to help decreasing the output congestion.





# Business case – Scenarios

- Investment (estimated)  
€ 264.314 (not taken into account the subsidy)
- Expected sales kWh  
198.190 per year
- Exploitation (expected gross profit)  
€ 47.583 per year
- Financial feasibility (without subsidy)  
Break-even after 5,47 years

Note: V2G charging is not yet taken into account a needed figures are not available yet. Its likely that adding V2G to the SSCH will improve the Business Case.



# Sensitivity analysis business case

[illegible]

# Conclusion

Realizing a Super Smart Charging Hub, where energy supply and demand are matched and where charging is done as smartly as possible, is a complex task.

This is no different for the situation of a SSCH in Vlissingen.

Describe findings on:

- *Location: Parking garage with 625 spots. This means that there will be enough traffic to create sufficient demand for EV charging.*
- *High variety of users: Mostly long-stay. Important is the demand of DAMEN for ECV charging. This is a solid basis.*
- *Policy & longterm planning:*
  - ***Municipality focusses on decentralized parking outside the city centre. Machinefabriek fits in this policy.***
  - ***The use of shared – mobility, based on demands fits in this policy as well. The up-take in shared mobility is slowly and will cross the trend of autonomous transport.***
- *Business case*
  - ***Optimal use of dynamic prices (purchase through grid connection) and storage of local production of kWh will lead to relatively low prices for EV drivers***
  - ***Sufficient grid connection***
  - ***Future demand?***

“At the moment, we consider a Super Smart Charging Hub feasible”.



# SSCH Consortium

## Living Lab Partners



## Research partner



## Network and knowledge partners



## Replication partners

