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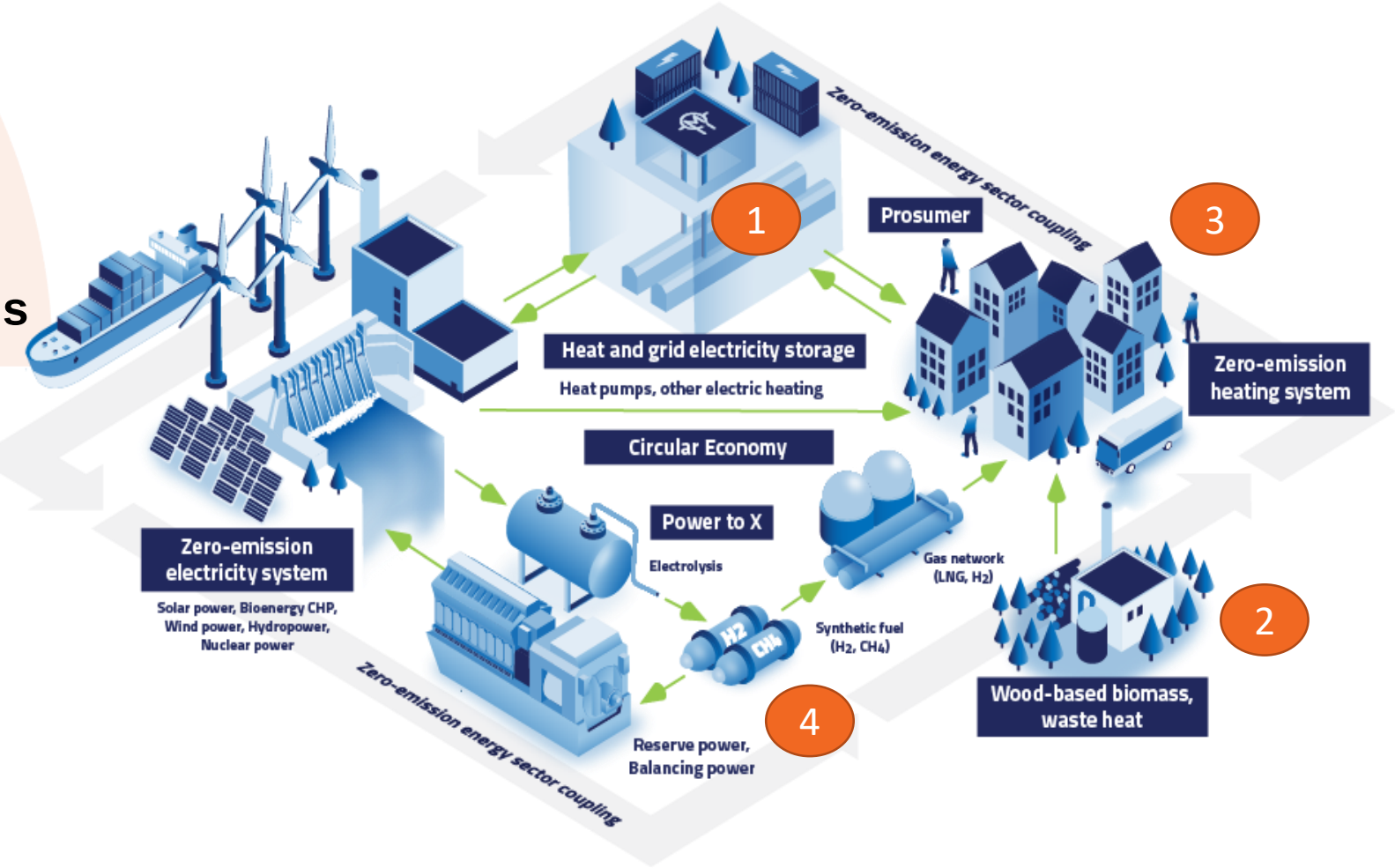
smart cities

Positive Energy Districts as Innovation Ecosystems: Connections - Competence - Capital

Carbon Neutral Vaasa 202X – Innovation Ecosystem

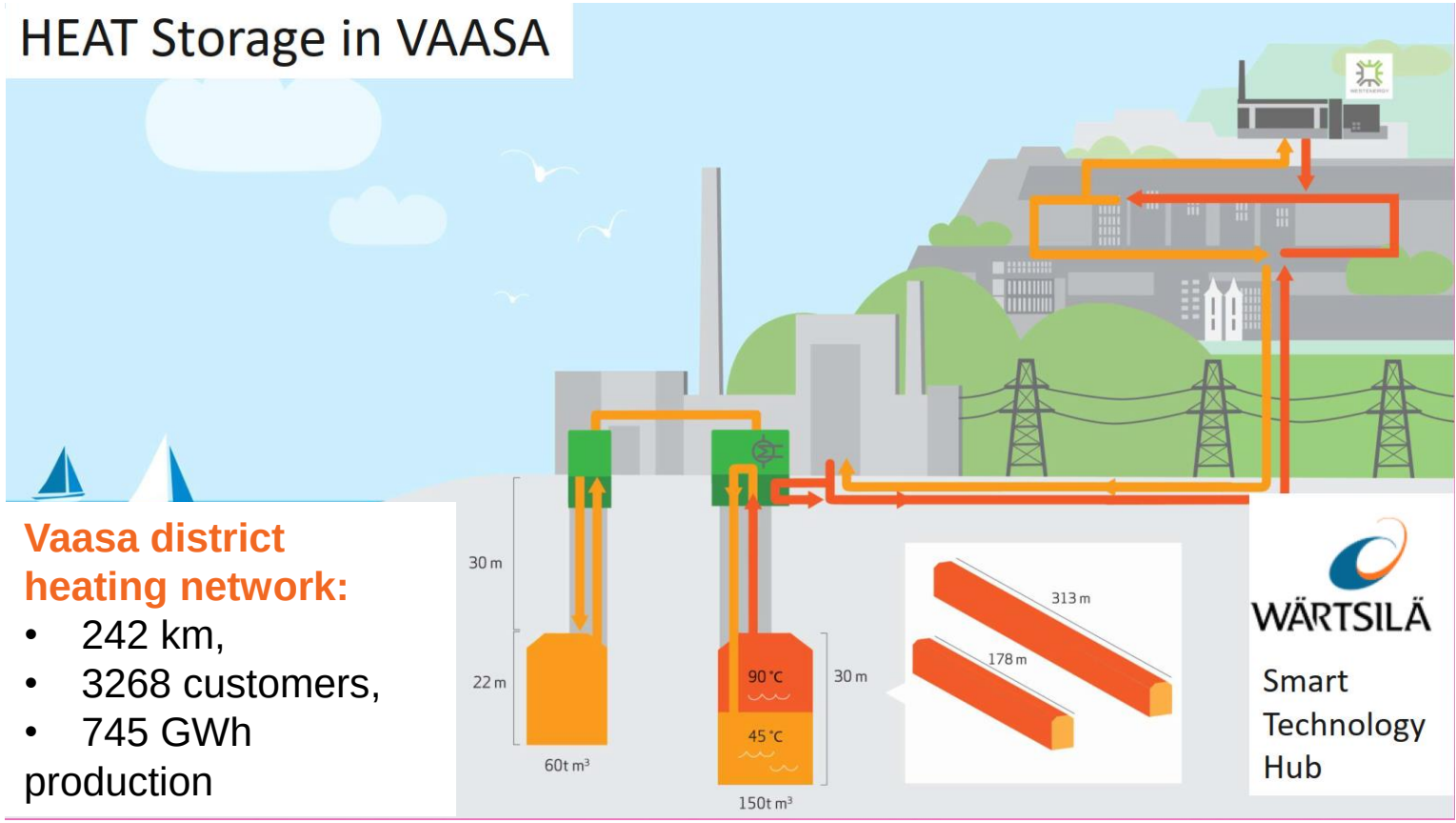
- Vaasa is looking at carbon neutrality from an energy system perspective.
- Piloting innovative solutions is a way to build connections, competence and capital.
- The up-scaling of piloted innovations is done by world leading companies in the EnergyVaasa cluster.



Symbiotic Waste heat Networks (TT#1) combined with smart multisourced low temperature district heating and innovative storage (TT#2)

VASKILUOTO

- District heating network – target to achive carbon neutrality in heat production by 2025.
- Old fuel underground storage was prepared as heat storage.
- Use of waste heat from WestEnergy, Smart Technology Hub and other sources.
- Vaasan Sähkö (Energy company) implemented the storage in fall 2020.
- 10% reduction in emissions in first winter.
- **Study case**: Gothenburg, Utrecht



Vaasa district heating network:

- 242 km,
- 3268 customers,
- 745 GWh production

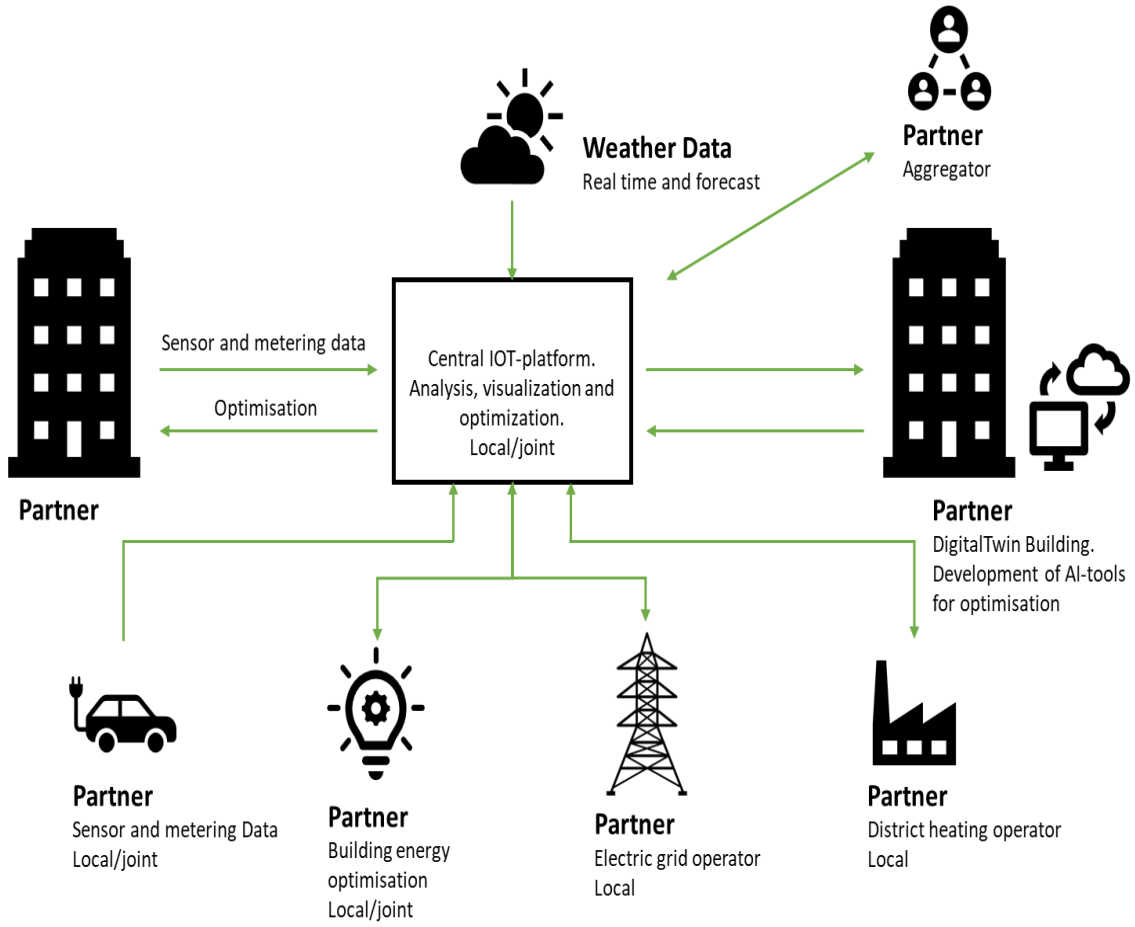
Implementing Projects with National Funding

- Vaasan Sähkö is implementing several projects, funded by Ministry of Affairs, which can use the heat storage and make the energy production carbon neutral by 2025:
  - Pått waste water treatment plant: 8 MW heat pump installation to recover waste heat into the heat storage. Replace 49 GWh coal/a.
  - Wärtsilä Smart Technology Hub: 3 MW heat pump installation to recover waste heat into the heat storage. Replace 18 GWh coal/a.
  - Bio-CHP –plant: The plant can produce 85 MW heat and 23 MW electricity from biomass. This will replace 806 GWh coal/a.

A City Innovation Platform (TT#4) for Energy optimisation (TT#2) and smart vehicle charging (TT#3)

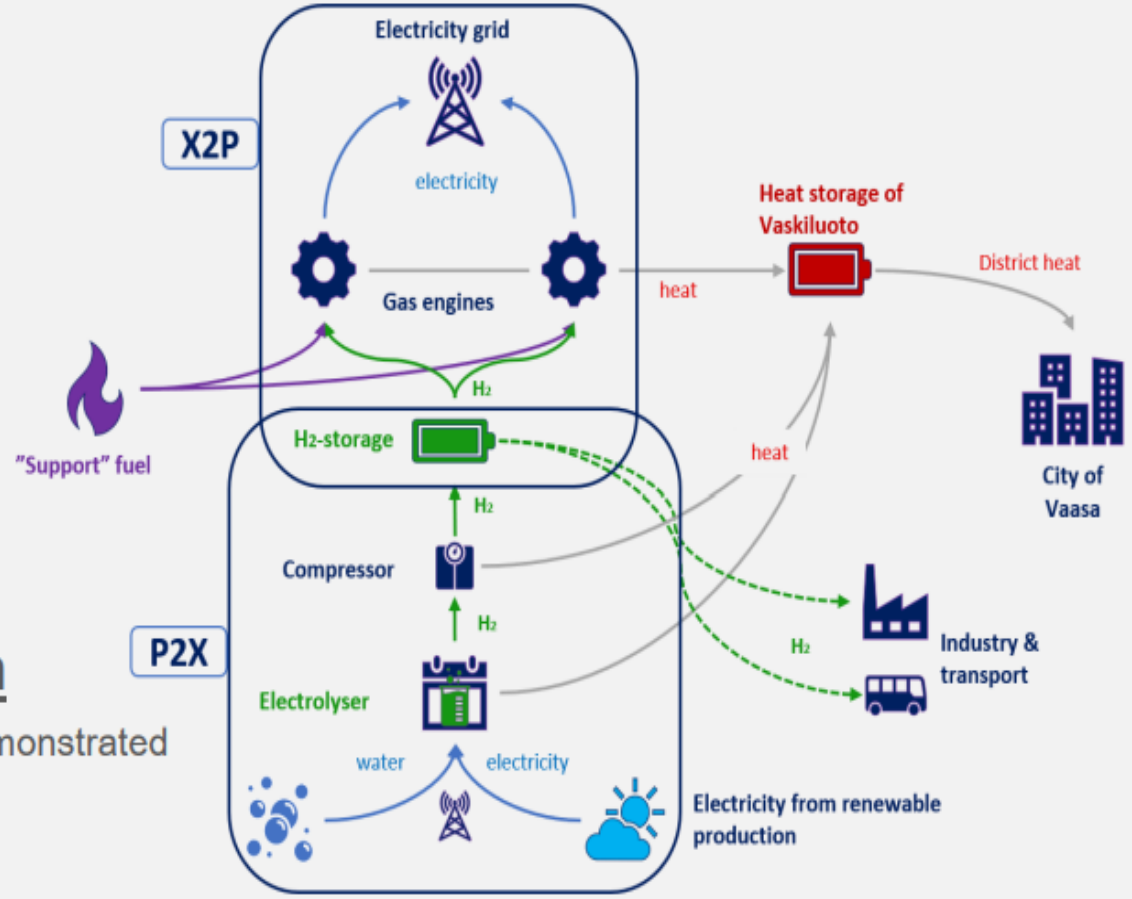
The City Innovation Platform for Energy optimization and smart vehicle charging will be developed with city, corporate and national funding:

- First building pilots will start in 2022 with corporate funding (Vaasan Sähkö).
- City and national funding will be used to develop a central IOT-platform which can be used by different buildings owners for energy optimization and smart vehicle charging.
- Savings from energy optimization can be re-invested in the development of the city innovation platform.
- **Study case**: Gothenburg, Utrecht, Nice



Piloting New Circular Economy Concepts with national funding

- Renewable electricity
- Water cleaning (distillate)
- Electrolysis when electricity **price is Low**
  - Store excess heat and O_2*
- Compressing H_2
  - Store excess heat
- Novel high pressure H_2 storage
- Reconverting H_2 to electricity when **price is High**
  - 24 MW plant in which the Hydrogen engine concept will be demonstrated
  - 25% vol. H_2 in 2023 + 75% vol. Biomethane/LNG
  - Aiming at 100% vol. H_2 in 2029
  - Store excess heat



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THANK YOU

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