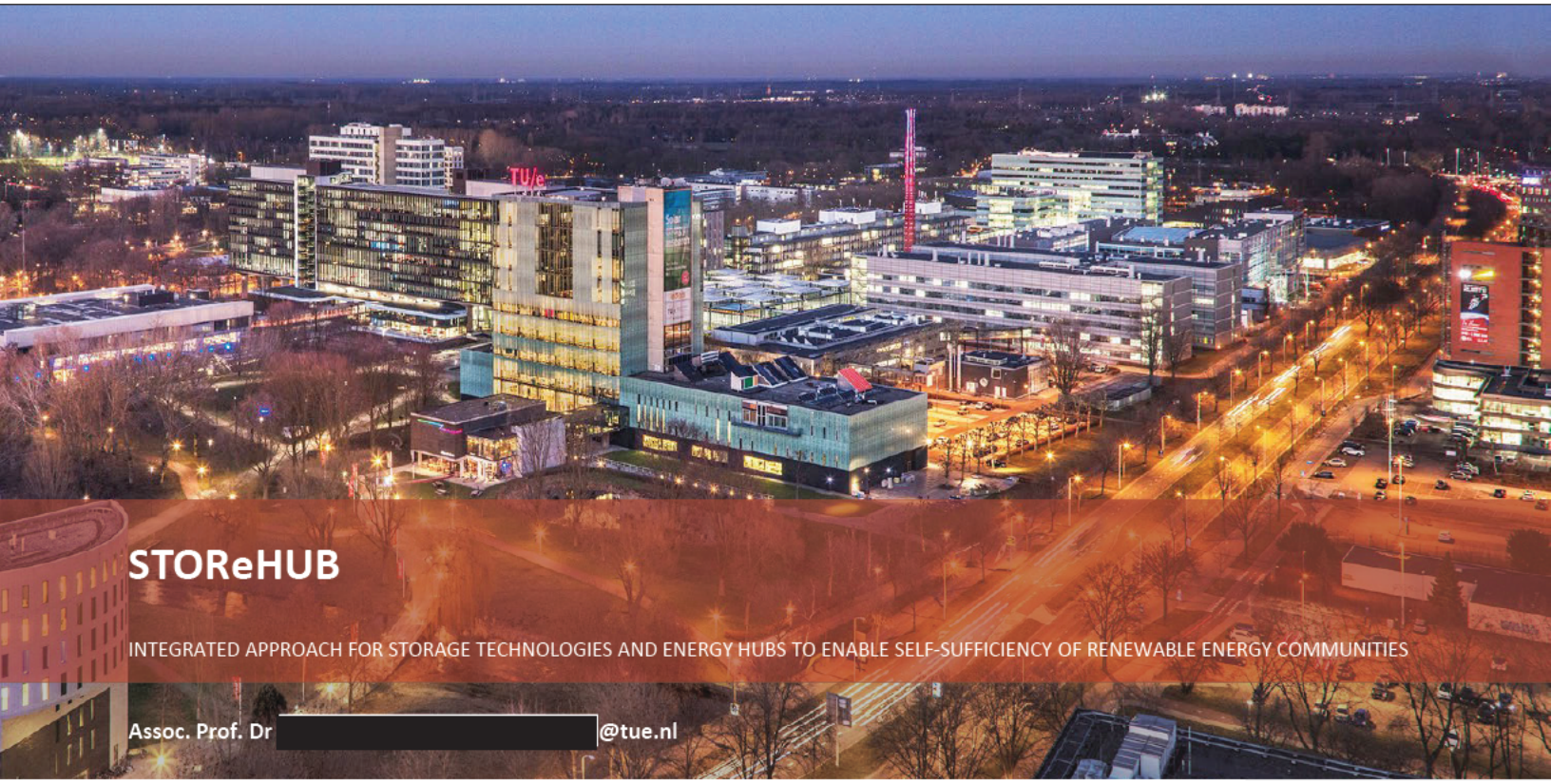


STOReHUB

INTEGRATED APPROACH FOR STORAGE TECHNOLOGIES AND ENERGY HUBS TO ENABLE SELF-SUFFICIENCY OF RENEWABLE ENERGY COMMUNITIES

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TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY

Overzicht van opmerkingen bij Digital Power & Energy Systems Labora

Deze pagina bevat geen opmerkingen.

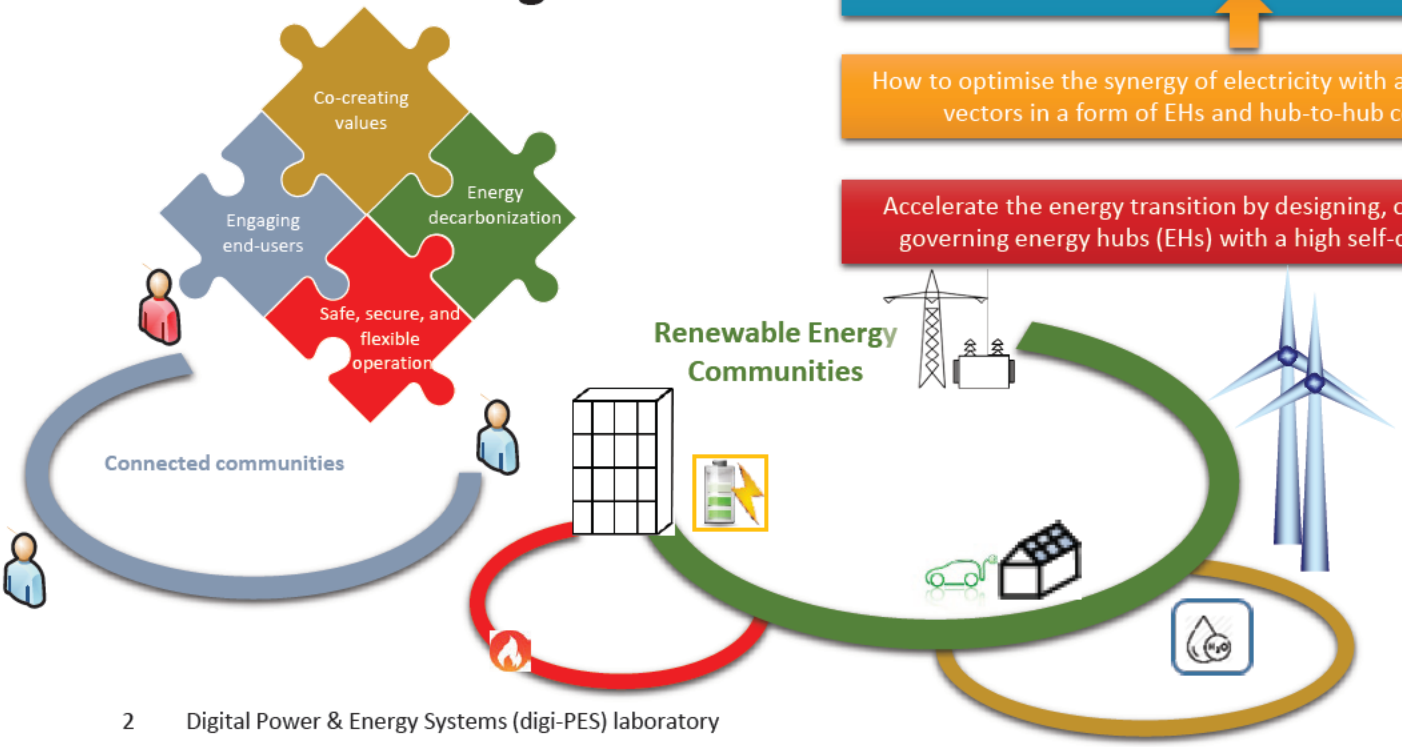
1

Societal challenge

How can we store, convert, and transport energy efficiently? How can we undertake the transition to an entirely sustainable energy supply?

How to optimise the synergy of electricity with all other energy vectors in a form of EHs and hub-to-hub coupling?

Accelerate the energy transition by designing, optimizing and governing energy hubs (EHs) with a high self-consumption



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As we all know, the energy transition is emerging in all level of our energy systems..

Renewable energy communities such as PV-rich buildings neighbourhood are considered as the cornerstone for the emerging energy transition to achieve its sustainable and carbon-neutrality targets. This together with the emerging deployment of other distributed energy resources, i.e. electric vehicles, heat pumps, creates various (connected) energy islands, e.g. microgrid (electricity), electric bus fleet (mobility), or building neighbourhoods (building) crossing over multiple economic sectors.

However, the development of such system focuses mainly on electricity as the most sustainable energy carrier while there is a limited interaction with other energy vectors such as heating/cooling, mobility, or hydrogen. This leads to an inefficient operation with substantial energy losses due to the natural differences in each energy vector.

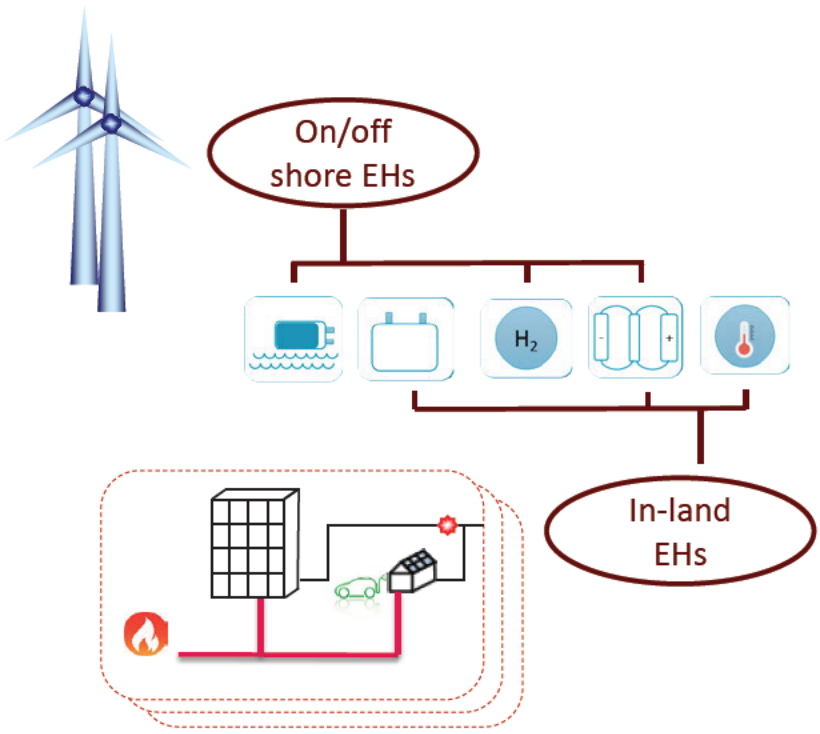
Recap pre-proposal

Research questions:

- What energy storage and conversion solutions/technologies should be included in energy hubs (EHs) to maximise self-consumption?
- How can various EHs be orchestrated via multiple energy carriers to support the integration of large-scale renewable energy sources?
- Which rules and governance mechanisms are needed to facilitate the creation of hubs and hub-to-hub coupling?

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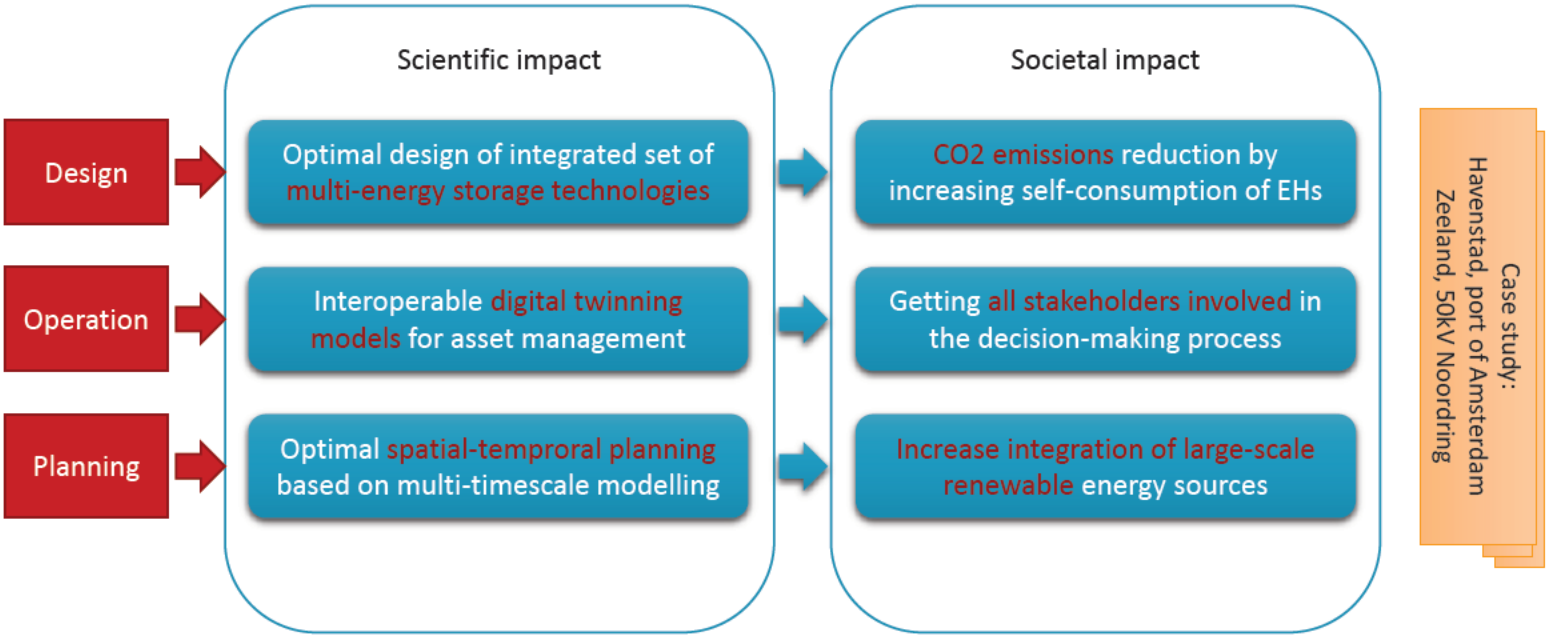
Proposal Concept



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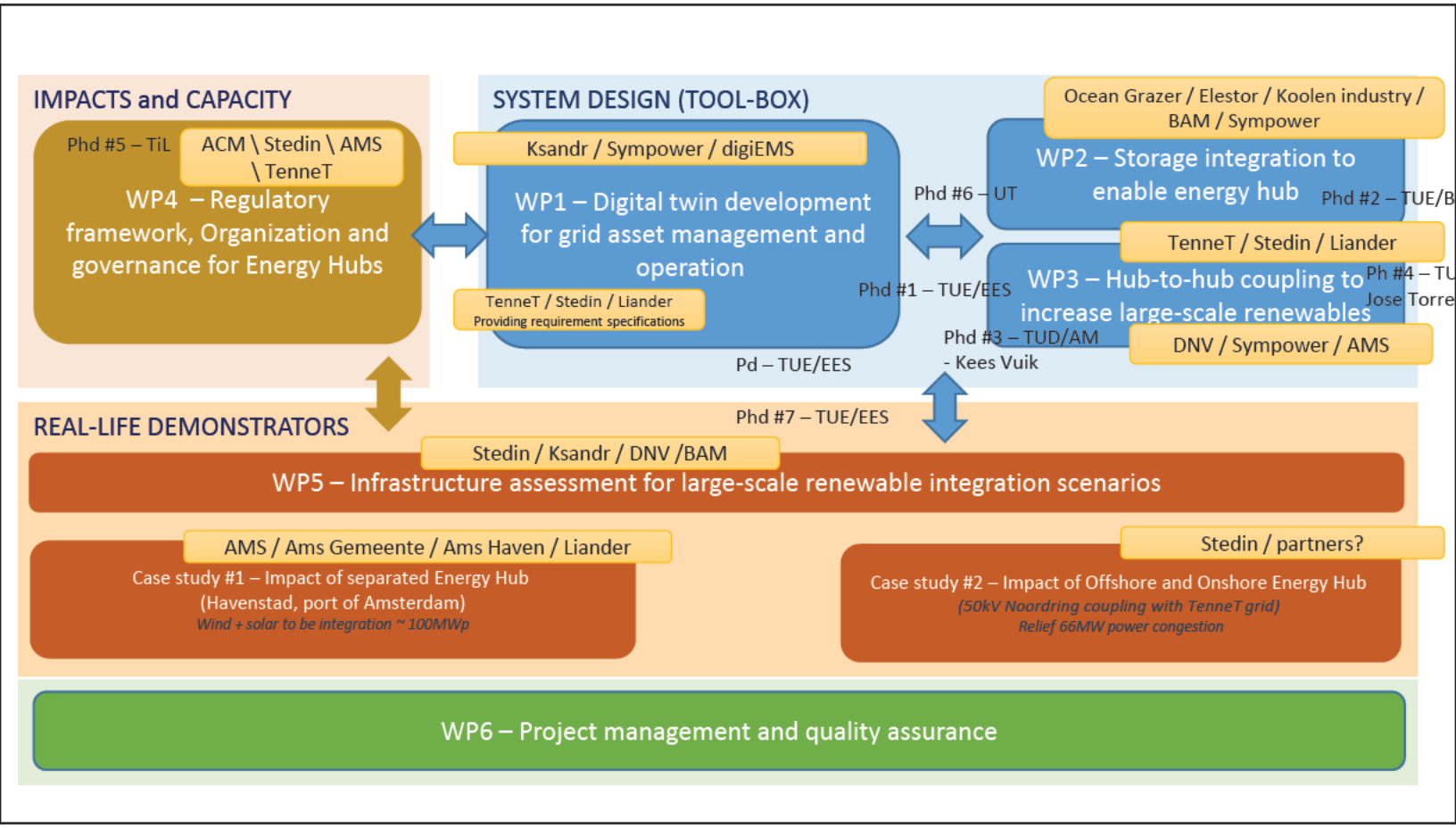
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Expected outcome



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IMPACTS and CAPACITY
Phd #5 – TiL
ACM \ Stedin \ AMS \ TenneT
WP4 – Regulatory framework, Organization and governance for Energy Hubs
SYSTEM DESIGN (TOOL-BOX)
Ksandr / Sympower / digiEMS
WP1 – Digital twin development for grid asset management and operation
TenneT / Stedin / Liander
Providing requirement specifications
Pd – TUE/EES
Phd #6 – UT
Ocean Grazer / Elestor / Koolen industry / BAM / Sympower
WP2 – Storage integration to enable energy hub
Phd #2 – TUE/B
TenneT / Stedin / Liander
Phd #1 – TUE/EES
WP3 – Hub-to-hub coupling to increase large-scale renewables
Ph #4 – TU
Jose Torre
Phd #3 – TUD/AM
- Kees Vuik
DNV / Sympower / AMS
Phd #7 – TUE/EES
REAL-LIFE DEMONSTRATORS
Stedin / Ksandr / DNV /BAM
WP5 – Infrastructure assessment for large-scale renewable integration scenarios
AMS / Ams Gemeente / Ams Haven / Liander
Case study #1 – Impact of separated Energy Hub (Havenstad, port of Amsterdam)
Wind + solar to be integration ~ 100MWp
Stedin / partners?
Case study #2 – Impact of Offshore and Onshore Energy Hub
(50kV Noordring coupling with TenneT grid)
Relief 66MW power congestion
WP6 – Project management and quality assurance

Deze pagina bevat geen opmerkingen.