Requirements for viable business models for Smart Multi-commodity Energy Hubs (SMCEH)

Client	Entrance
Related project	LEVE Energiehubs!
Start date	Flexible
Suitable for training course(s)	EMRE, SESyM, SSE, Operations Research, Physics, Mathematics, EES or similar
Learning Community	System Integration

Assignment context

The LEVE Energiehubs! Project aims to develop a theoretical framework to judge the viability of SMCEH within the existing and developing regulatory environment. The framework will identify the goals, barriers, risks and the effect of these factors on the viability of different types of SMCEH. KPI's will be defined per type of hub to determine if a hub is achieving its intended goal within the determined constraints and serve as output for numerical models. With different type of hubs different types of assets could be needed which could lead to differing system configurations and differing operational strategies, e.g. trade-offs between certain assets regarding storage and back-up facilities. Such trade-offs may affect KPI's like reliability while decreasing a KPI such as profitability which different stakeholders may value differently.

This assignment encompasses the analysis of the business models a SMCEH can apply depending on its goal and to determine the requirements to make such business models viable.

Assignment

A SMCEH is a complex system that can consist of different energy generation, demand, storage and conversion sources. Depending on the goal of the system, different operational strategies using these various components are possible to achieve system goals. These different operational strategies and system goals will lead to different business models. These business models will not be viable in all cases. The crux of this assignment is identifying the business models different types of SMCEH can apply and the key factors determining the viability of these business models. These factors should cover a whole systems perspective (PESTEL) (See the paper by Couraud et al. Responsive FLEXibility: A smart local energy system for an overview of a whole systems perspective for smart local energy systems). The analysis should cover the requirements needed in these key factors to make the business model viable. The quantitative work should be done in an open-source software tool such as EnergyPlan to model the SMCEH and the output of the tool

used as input for societal cost benefit analysis (SCBA). The consultancy firm CE Delft has published a report (Mkba energiehubs) quantifying the value of archetypical SMCEH using a SCBA methodology. For this project the archetypical SMCEH defined in the CE Delft report can be used as a starting point in building the different SMCEH in an open-source software tool. Figure 1 shows the approach used in that study which can be used as starting point for this assignment with the focus being the quantitative part of the modelling represented by steps 3-5.

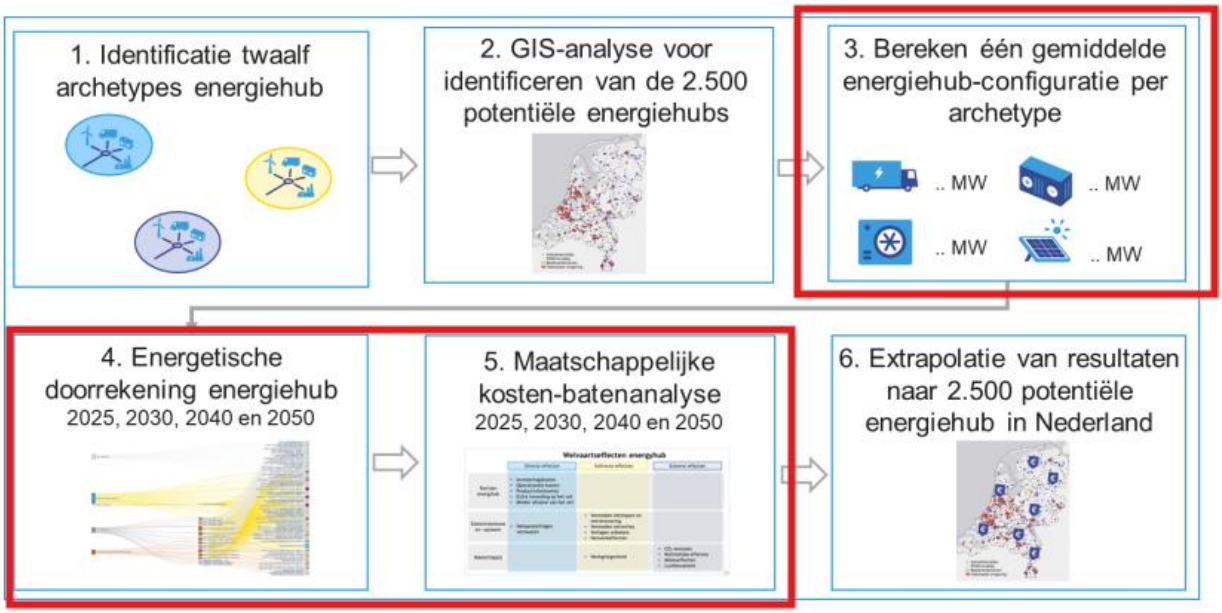

Figure 1: The approach used by CE Delft in their study, for this assignment the focus will be on steps 3-5.

General information

Final Product	Paper on what types of business models SMCEH can apply within the existing and developing regulatory framework. Key factors should be identified using a whole system perspective (PESTEL) that make the business models unviable. Requirements needed in these key factors should be identified to make the business models viable. Modelling should be done using an open source software tool such as EnergyPlan.
Location	Entrance
Parties involved	Hanze, RUG, HvA, Windesheim
Contact person	Edrick Tromp (e.o.v.tromp@pl.hanze.nl)
Supervision	Rosa Kappert and Edrick Tromp

Who are we and where can you find us?

ENTRANCE is a learning community, where students and professors from various programmes cooperate with researchers, companies, governments and civil society organisations to accelerate the energy transition. We do this at the following locations:

- Location Proeftuin, Zernikelaan 17, Groningen

- Location Energy Academy Europe, Nijenborgh 6, Groningen

What do we offer?

ENTRANCE offers a multidisciplinary and inspiring learning, working and research environment where you can develop the competencies needed to shape and accelerate the energy transition. There is room for collaboration with professors, researchers, lecturers and the professional field. In addition, you will be supervised by professionals who are part of the ENTRANCE learning community.

Contact us

Are you interested in the vacancy? Do you have questions or would you like to apply immediately?

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