

January 13, 2025

Topic description of the Distance Learning Seminar 2025

Business models in nascent ecosystems: The example of the green hydrogen powered heavy truck sector

The Distance Learning Seminar is an international cooperative course between i. University of Lodz, Poland, ii. Europa-Universität Flensburg, Schleswig-Holstein, Germany, iii. University of Applied Sciences Kempten, Bavaria, Germany and iv. Radboud University Nijmegen, The Netherlands. The seminar is designed to acquaint participants with theoretical and practical knowledge of the field as specified below. Further, participants gain experience in cooperating in an international research team regarding the related topics.

The general aims and objectives lie in:

- to experience working in an intercultural and interdisciplinary team
- to integrate knowledge from different modules and apply it into a research study
- to learn how to set up a small empirical research
- to learn how to present the research results
- to experience working in a hybrid learning format

In 2025, the course deals with business models for nascent ecosystems. The challenges of business model design in such ecosystems is illustrated for the green hydrogen powered heavy and light commercial vehicle (HCV and LCV) sector. The term “green” refers to the production of green hydrogen from renewable energy sources such as wind or solar energy. Many countries worldwide have hopes with regard to the usage of green hydrogen in different sectors. In the area of road transport, hydrogen could help to reduce the negative environmental impact of the sector. Green hydrogen to power LCVs and especially HCVs could be a means to eradicate emissions, in particular CO₂, in a sector that is regarded as a major pollutant. This would also contribute to the climate goals of the European Union (or regions outside Europe).

However, due to the high cost and scarcity of green hydrogen, the development of green hydrogen-powered transport is hindered by hesitant actors who are uncertain about the profitability of investing in this technology. Technologies such as combustion or battery-electric trucks are currently competing with hydrogen fuel-cell powered trucks, and it is still not clear which technology will succeed in the context of a specific customer application (e.g., long distance transportation or last-mile transportation in cities). In addition, a network of green hydrogen fuel stations has to be established, and trucks have to be brought into the market that can use green hydrogen. These vehicles have to be sold, financed and leased, they have to be repaired and maintained. A whole ecosystem around green hydrogen still needs to be established.

In this course, we want to investigate business models and strategies on different levels and around different actors in this nascent ecosystem in order to identify potentials and challenges of using green hydrogen in the heavy traffic sector.

Each student group is assigned one case to explore and investigate which activities this actor does contribute to the establishment of the nascent ecosystem. The aim of the seminar is to come to an in-depth understanding of the following cases/actors and their activities along the green hydrogen value chain:

Case/Actor I	Producer of green hydrogen GP JOULE, Germany (https://www.gp-joule.com/en/)
Case/Actor II	Producer of green hydrogen Roger Energy (https://www.roger.energy/production)
Case/Actor III	H₂ production and supply GREENH2HUB; INFENER AG; Neumünster, Germany (https://www.infener.com/pages/green-h2-hubs)
Case/Actor IV	Operator of (green) hydrogen fuelling stations ORLEN, Poland (https://www.orlen.pl/en)
Case/Actor V	Vehicle manufacturer for hydrogen-powered trucks MAN, Germany (https://www.man.eu/de/de/homepage.html)
Case/Actor VI	Hydrogen truck distributor providing alternative ownership models for hydrogen trucks HyLane, Germany (https://www.hylane.de/)

The case examples should be investigated in the context of the market side they contribute to as well as in relation to relevant market characteristics. This means that you will analyze the way your case operates within the ecosystem, rather than describe the situation.

In order to achieve this, we propose a step-by-step approach:

The **core task for all groups** is to *map the value creation activities* by the case company. This is your focal actor within an ecosystem who has made some conscious decisions on what to do/what not to do/how to create value.

After mapping value creating activities, the *value proposition* of the focal actor can be designed: What about cost advantages or disadvantages? In what way is differentiation an advantage? What other advantages are to be expected? How will all this bring value to your case company?

Building on this, you set focus on interaction within the ecosystem. Each case company will be dependent on further activities within the ecosystem to operate. However, the green hydrogen powered heavy truck sector is characterized as a nascent ecosystem, so parts may be underdeveloped

if at all present. The ability of your case company to create value will surely be affected by this. Therefore it is important to illustrate *how value may be created* by all needed activities outside of the firm. (What is needed next to the activities of the focal actor to bring green hydrogen powered trucks to the roads?).

Finally, *value capture* for the case company in the form of a revenue model will need to be discussed. This means that the break down of costs and revenues should be considered. In what way value is distributed across partners in the ecosystem? What are the opportunities for the case company to improve its value generated?

At this point, your analysis will feed into the next iteration of the analysis: if value can be improved, how will value generating activities be affected, followed by an improved value proposition, et cetera. Since this is a case within a nascent ecosystem, a constant state of flux should be expected. So be prepared to revisit your analysis and question your outcomes.

The final goal of this course is the production of a paper dealing with one of the cases/the focal actors in a team of students from the different locations (please see the course guidelines for the research papers for relevant specifications). The student groups are also required to give presentations about their research online and in person. Next to the Credit Points given for the course at the different universities, the students get a joint certificate signed by the partners about their participation in the project.