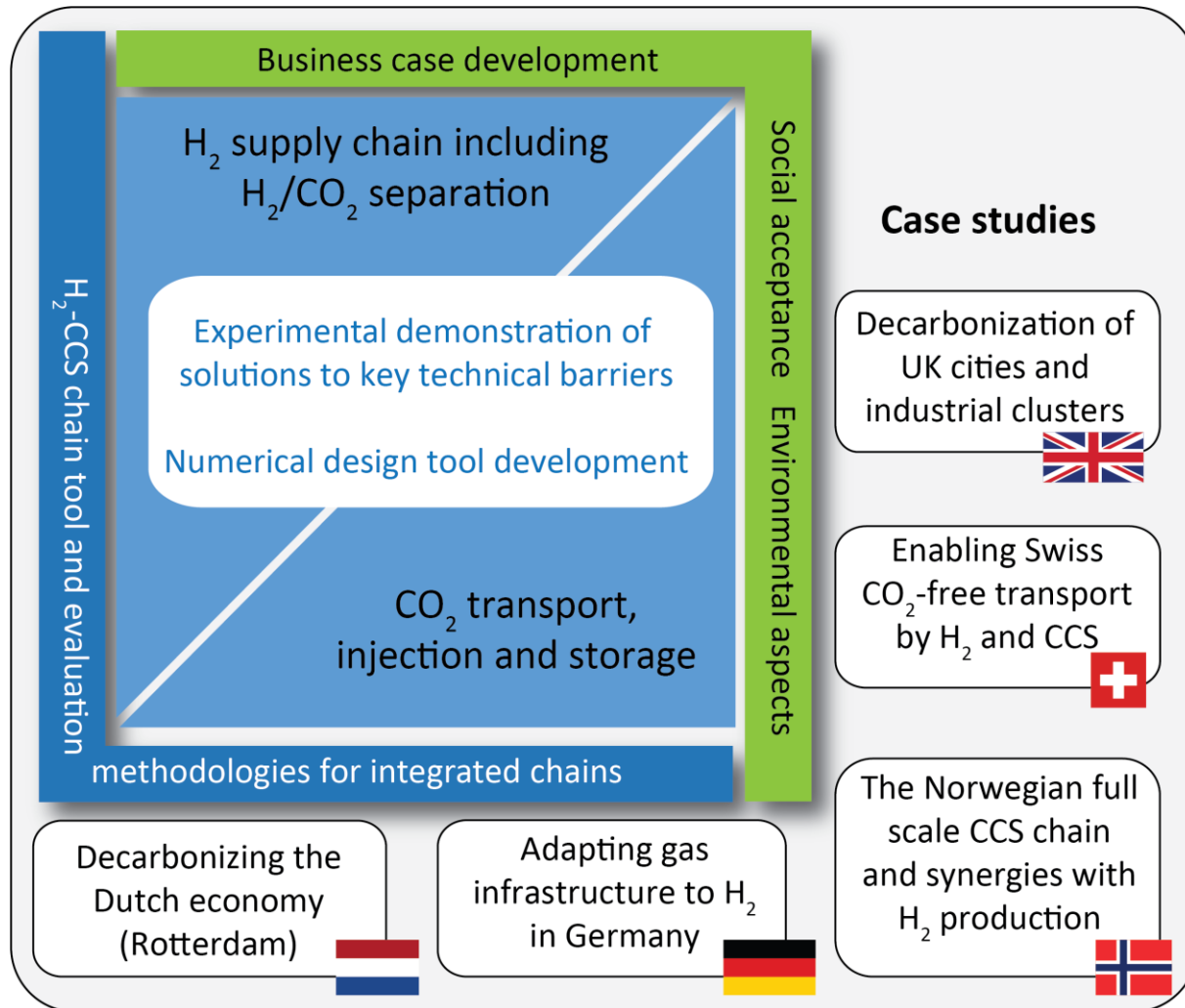
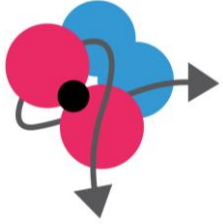
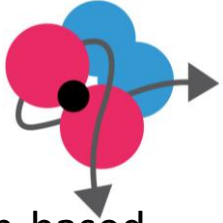


ELEGANCY – Enabling a low-carbon economy via H₂ and CCS by...



1. improving the Life Cycle Analysis performance of hydrogen production with CCS;
2. enhancing our understanding of CO₂ storage, particularly stemming from H₂ production;
3. enabling low carbon H₂ production with fossil-carbon or biomass via new market models;
4. designing cost-optimal and carbon footprint-optimal H₂ and CO₂ networks;
5. assessing country-specific challenges and opportunities, and identifying feasible country-specific pathways towards a H₂ economy coupled with CCS;
6. educating the next generation of European engineers and scientists on H₂ and CCS.

ELEGANCY enables a low-carbon economy via H₂ and CCS, because:



1. Advanced CO₂ capture technologies – either optimally designed amine-based or newly developed adsorption-based – coupled with either Steam Methane Reforming or Auto-Thermal Reforming (using either natural gas or biomass as feedstock) improve the Life Cycle Analysis performance of hydrogen production with CCS.
2. New thermodynamic modelling tools and new CO₂ transport experiments, in both surface laboratories and deep ones, strongly enhance our understanding of the underground storage of CO₂, particularly when originated from hydrogen production.
3. Thorough analysis of technical and economic interdependencies and exchange with numerous stakeholders allow for the design of business models and market mechanisms to enable a low-carbon hydrogen economy based on fossil-carbon and biomass.
4. Newly developed network modelling tools enable the design of hydrogen and carbon dioxide networks, which – depending crucially on the distribution of hydrogen demand and on the location of CO₂ storage sites, as well as on the nature of the feedstock – best compromise between carbon footprint and costs.
5. The enhanced understanding of scientific, technical and economic aspects of hydrogen production with CCS acquired in the WPs 1 to 4 not only leads to a clear assessment of the challenges faced in the different implementation of the technology chains in the five countries and the corresponding case studies, but it also identifies pathways and opportunities.
6. Elegancy is educating scores of European scientists and engineers, of graduate and undergraduate students, in the science and technology related to the hydrogen economy and to the sustainable implementation of CCS.