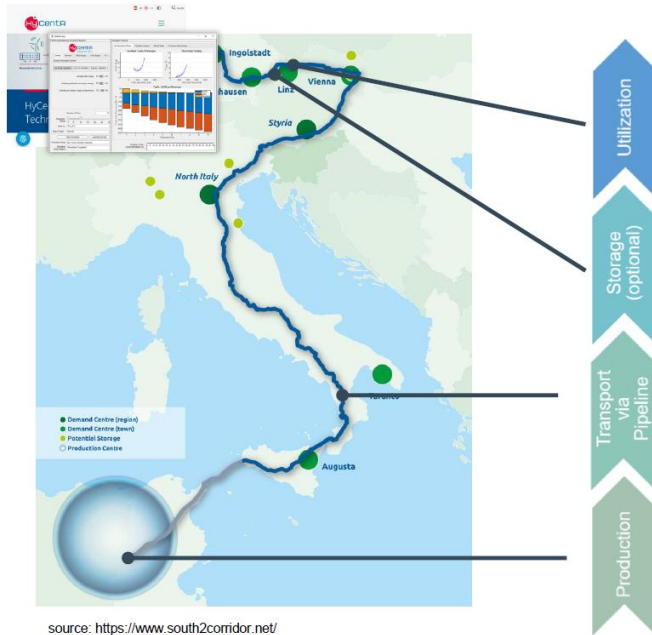


# Assessing Carbon Footprints of Hydrogen Supply Chains: North African Imports vs. Domestic Production



The decarbonization of energy systems requires a rapid ramp-up of low-carbon hydrogen production and supply chains. As regions such as North Africa offer cost-competitive renewable resources, the potential for exporting hydrogen to Central European countries, including Austria, has become a topic of major strategic interest. At the same time, domestic hydrogen production capacities are developing, raising the need for transparent and science-based comparisons of environmental impacts.

This thesis will focus on the **calculation of CO<sub>2</sub> emissions along the hydrogen value chain**, covering production in North Africa and transportation to Austria, as well as a comparative scenario with hydrogen produced within Europe. The main objective is to compile a process-level carbon footprint for the relevant steps in each supply pathway. This assessment will contribute to developing a broader **Life Cycle Assessment (LCA)** perspective, illustrating how such analyses can inform comparisons of supply options, guide methodological choices, and support future evaluations of the environmental sustainability of hydrogen supply chains.

## Content / Time table:

- Literature review of existing hydrogen production, transport, and LCA studies. (2 month)
- Model-based calculation of CO<sub>2</sub> emissions along the hydrogen import chain and a domestic production scenario. Comparison and sensitivity analysis of both pathways. (2 months)
- Identification of data gaps, methodological challenges, and additional efforts required to extend the study into a full LCA, draft of a proposed methodology for future LCAs of hydrogen value chains. (1 month)
- Evaluation of results and thesis writing. (1 month)

**Start:** as of now  
**Duration:** approx. 6 months

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