

## In the field of hydrogen production processes

### Title of the thesis:

„Techno-economic analysis of low-carbon hydrogen production technologies“

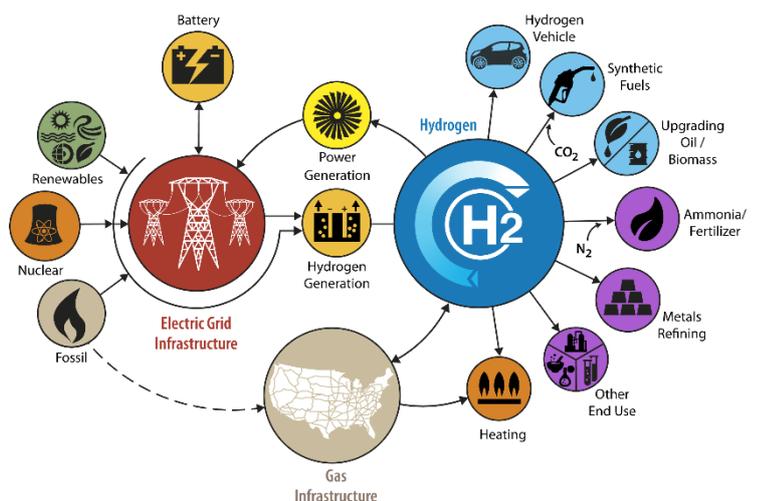
### Background:

The trend of a shift to a low-carbon technology for energy production is an inevitable follow-up of the transition of the energy sector towards full decarbonisation until 2050. An electric system based on renewable energy faces challenges concerning the storage and utilization of energy due to the intermittent and seasonal nature of renewable energy sources. Wind and solar photovoltaic power productions are variable and difficult to predict, and thus electricity storage will be needed in the case of basic power production. Hydrogen's energetic potential lies in its ability and versatility to store chemical energy, to serve as an energy carrier and as feedstock for various industries. Conventional method for hydrogen production is the process of steam reforming using fossil fuels (primarily natural gas). Alternative methods of hydrogen production are of interest if they offer improvements in cost, efficiency, flexibility, and/or impact on the environment.

The goal of this work is to analyze possible low-carbon hydrogen production pathways and to determine the most economical, environmentally-benign and feasible paths for the production and delivery of H<sub>2</sub> for the needs of the industry, transport and heating sector in Austria.

### Outline of the content covered in the work:

- Literature research of the existing and emerging hydrogen production technologies
- Identification and selection of the relevant techno-economic influencing factors
- Determining the current, as well as the future hydrogen demand in Austria based on selected energy scenarios
- Comparative evaluation and assessment of the most suitable H<sub>2</sub> production pathways
- Documentation of the work



### Conditions:

Interest in research; Team work