

## Thesis Brief Description

---

<b>Thesis Title</b>	<b>The Use of Hydrogen for Heating in Buildings and the Greening of Natural Gas Networks</b>
<b>Programme of Studies</b>	BSc in Mechanical Engineering, Frederick University
<b>Course</b>	OG 405 Senior Project
<b>Area of Study</b>	Sustainable Energy Technologies - Hydrogen
<b>Student's Name</b>	Constantina Kyriakou
<b>Students Reg. Number</b>	16422
<b>Supervisor</b>	Dr.-Ing. Paris A. Fokaides, Asst. Professor, Mechanical Engineering Department
<b>Supervisory Committee</b>	Dr Chris Christodoulou, Professor, Mechanical Engineering Department Dr. George Karagiorgis, Professor, Mechanical Engineering Department
<b>Semester</b>	Spring Semester 2023
<b>Short Description</b>	In recent years, hydrogen's popularity as a decarbonizing energy source has surged. Its diverse production methods, including renewable energy-powered electrolysis, are noteworthy. Hydrogen can substitute carbon-emitting natural gas, intensifying interest. This study assesses hydrogen's viability for building heating and transforming gas networks into hydrogen grids, with a focus on three Cyprus building types. The research comprises three sections. First, green hydrogen production through electrolysis is explored via literature review and international case studies. Second, converting gas grids to hydrogen blends is probed, assessing feasibility, challenges, and remedies. The third phase models hydrogen's building use, simulating energy performance via Eco software. Anticipated outcomes include insights into hydrogen's potential for heating and gas network conversion. Challenges and solutions in this conversion will be outlined. Building energy simulations will reveal hydrogen's capacity to curtail emissions and enhance energy efficiency.