

Thesis Title	Renewable Energy System for Mesana Village
Programme of Studies	MSc in Energy Engineering
Course	MEE 540 - MSc Thesis
Area of Study	Sustainable Transport – Hydrogen Technologies
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Semester	Spring Semester 2025
Short Description	This MSc thesis examines the design and feasibility of a hybrid renewable energy system for Mesana Village, a small rural community in Cyprus. Using real electricity consumption data and local climatic conditions, the study evaluates the integration of solar photovoltaic panels, wind turbines, and battery storage to reduce grid dependency and carbon emissions. Technical and economic analyses are conducted using indicators such as renewable energy penetration, payback period, and CO ₂ reduction. Results show that a solar-dominant system provides the most cost-effective solution, achieving approximately 85% renewable energy coverage and significant environmental benefits, while wind energy and storage enhance system resilience and reliability.