

Master Thesis Brief Description

Thesis Title	Development and Performance Evaluation of a Small Scale Model for an Oscillating Water Column System for Electricity Generation from Ocean Waves
Programme of Studies	MSc in Energy Engineering
Course	MEE 540 MSc Thesis
Area of Study	Sustainable Energy Technologies – Wave Energy
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Students Reg. Number	23005
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Supervisory Committee	Dr Chris Christodoulou, Professor, Mechanical Engineering Department Dr. George Karagiorgis, Professor, Mechanical Engineering Department
Semester	Fall Semester 2023
Short Description	<p>The thesis titled "Design and Construction of a 'Development and Performance Evaluation of a Small Scale Model for an Oscillating Water Column System for Electricity Generation from Ocean'" focused on the Oscillating Water Column (OWC) technology, a popular wave energy converter that transforms ocean wave energy into electrical energy. The main objective was to provide a detailed presentation of the construction stages and the experimental process. A fixed platform was utilized, attached to the wall of the wave simulation tank at the University of West Attica, to test the model under various wave conditions. The investigation aimed to optimize the system performance for electricity generation from ocean waves by studying the effects of wave characteristics, geometry, and air turbine performance. The device comprised a PVC tube open at the bottom side of the water and at the top of the OWC chamber. During the experiments, wave elevations inside and outside the model were recorded using a wave probe and analysed through Fast Fourier Transformation (FFT). The document commenced with a historical overview of wave energy and tidal systems, followed by a comprehensive examination of the model. The theoretical framework, incremental modeling process, and experimental methodologies were outlined. The study concluded with the presentation of findings and conclusions from the experimental procedure, along with suggestions for future research prospects.</p>