

## Master Thesis Brief Description

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<b>Thesis Title</b>	<b>Characterisation of Pellets Derived From Solid Residues of the Winery Industry</b>
<b>Programme of Studies</b>	MSc in Energy Systems and the Built Environment
<b>Course</b>	MES 580 Master Thesis
<b>Area of Study</b>	Sustainable Energy Technologies – Biofuels Assessment
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<b>Supervisory Committee</b>	Dr. George Karagiorgis, Assoc. Professor, Mechanical Engineering Department Dr. Byron Ioannou, Ass. Professor, Architectural Department
<b>Semester</b>	Fall Semester 2016
<b>Short Description</b>	<p>The aim of the project entitled “Energy and environmental assessment of pellets produced from solid residues of the winery industry – WELLETS” was the assessment of the potential of waste by-products of the Cypriot winery industry, to be pelletized and used as raw material for solid biofuels. This study was submitted for partial fulfilment of the acquisition requirements of Master degree in Sustainable Energy Systems of School of Engineering of Frederick University, Cyprus, in January 2017.</p> <p>In terms of this study, two different biomass blends have been pelletized and assessed as energy source for domestic hot water boilers. The samples were composed of Grape Pomace (P1) and Grape Pomace &amp; Vine Shoots Blends (P2). The raw material was sampled by a Cyprus local winery named Aes Ambelis (Nicosia, 35°01'12.4"N 33°09'19.5"E). The raw material was dried and pelletized at the facilities of the Agricultural Research Institute (ARI), in Cyprus, in terms of an MoU between Frederick University and Agricultural Research Institute for joint research activities. The produced pellets were analysed to define their moisture and ash content, based on well-established standardized methods, at the Sustainable Solid Fuels Lab of Frederick University. Combustion tests with the produced pellets were also carried out at the Boilers Lab of Frederick University. The measurement campaign focused on the flue gas analysis and particularly on the concentration of carbon monoxide, carbon dioxide, oxygen, lambda, water temperature and boilers efficiency measured.</p> <p>The results obtained from the analysis of the investigated samples showed that the majority of the examined pellets satisfied the minimum requirements of the EN ISO 17225-2 and EN ISO 17225-6 standards for woody and non-woody pellets respectively. Ash content and moisture content for both sample were also found to be within the limits of the standards. The results of the measurement campaign were also found to be in good agreement with results delivered by other studies conducted for similar biomass raw material.</p>