

Master Thesis Brief Description

Thesis Title	Elemental and Proximal Assessment of Spent Coffee Grounds
Programme of Studies	MSc in Energy Engineering
Course	MEE 540 MSc Thesis
Area of Study	Sustainable Energy Technologies – Biofuels Assessment
Student's Name	Stavros Georgiou
Students Reg. Number	14730
Supervisor	Dr.-Ing. Paris A. Fokaides, Assoc. Professor, Mechanical Engineering Department
Supervisory Committee	Dr Chris Christodoulou, Professor, Mechanical Engineering Department Dr. George Karagiorgis, Professor, Mechanical Engineering Department
Semester	Fall Semester 2023
Short Description	<p>The production of spent coffee grounds (SCGs) is a growing environmental problem, with vast amounts of this waste being generated annually. SCGs are a complex mixture of organic and inorganic compounds, including cellulose, lignin, caffeine, and minerals. The objective of this MSc thesis is to assess the elemental and proximal properties of SCGs generated in a city suburb, and to evaluate the feasibility of developing a collection and processing center in Nicosia.</p> <p>The methodology for this research will include four main steps:</p> <ol style="list-style-type: none">1. Quantification of the amount of spent coffee grounds in a city suburb: This step involves the collection of SCGs from selected cafes and households in a city suburb. The quantity of SCGs generated will be determined by weighing the collected samples.2. Proximal and elemental analysis of spent coffee grounds: The SCGs will be subjected to proximal and elemental analysis, including moisture and ash content, calorific value, and elemental composition.3. Life cycle assessment of pelletizing process: The pelletizing process will be evaluated using a life cycle assessment (LCA) approach. The LCA will assess the environmental impacts associated with the production of pellets from SCGs, including energy consumption, greenhouse gas emissions, and water usage.4. Feasibility assessment for the development of a collection and processing center in Nicosia: The feasibility of establishing a collection and processing center for SCGs in Nicosia will be assessed based on the findings of the previous steps. The cost and benefits associated with establishing such a center will be evaluated, including potential revenue streams, job creation, and environmental benefits. <p>Overall, this research aims to provide valuable insights into the elemental and proximal properties of SCGs, and to assess the feasibility of developing a collection and processing center in Nicosia. The findings of this study may have significant implications for the sustainable management of SCGs, as well as for the development of new and innovative waste management solutions.</p>