



**“Gheorghe Asachi” Technical University of Iasi, Romania**



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## **EXPLOITING THE POTENTIAL OF POLYETHYLENE MECHANICAL RECYCLING: ECONOMIC AND SUSTAINABILITY ANALYSIS**

**Leonardo Mita**

*Department of European and Mediterranean Cultures: Architecture, Environment, Cultural Heritage (DiCEM) University of Basilicata, University Campus of Matera, 75100, Matera (Italy),  
E-mail address: leonardomita@hotmail.com; Phone: +39 329 1244180*

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### **Abstract**

Plastic and circular economy are key words that characterize our present and seek to address the future of the global social economic system. Plastic, on the one hand, is the emblem of modern times, a low cost material with unparalleled functional properties. Circular economy, on the other hand defines an alternative model to traditional economy that focuses on sustainability. In this work, the author presents a case study relating to a virtuous example of circular economy applied to the industrial plastic sector used in the packaging field. The study was conducted through a cost-benefit analysis to evaluate the profitability of internal mechanical recycling of polyethylene and a sustainability analysis to characterize the circularity of the production process introduced. The benefits of introducing a production waste mechanical recycling line have been studied by comparing them to external recycling. The evaluation of the presented case is positive, from both an environmental and a business point of view in relation to the economic, energy and production efficiency factors.

*Key words:* circular economy, polyethylene, recycle

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