



13<sup>th</sup> International Conference on Industrial  
Engineering and Industrial Management

XXIII Congreso de Ingeniería de Organización



**Organizational  
Engineering  
in Industry 4.0**

**BOOK OF ABSTRACTS**

**Gijón, 11th-12th July 2019**

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Servicio de Publicaciones de la Universidad de Oviedo  
Campus de Humanidades. Edificio de Servicios. 33011 Oviedo (Asturias)  
Tel. 985 10 95 03 Fax 985 10 95 07  
[http: www.uniovi.es/publicaciones](http://www.uniovi.es/publicaciones)  
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I.S.B.N.: 978-84-17445-38-6  
DL AS 1875-2019

Imprime: Servicio de Publicaciones. Universidad de Oviedo

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## **An efficient waste to energy model for isolated environments. Case study: La Gomera**

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**Keywords:** waste to energy; isolated electricity system; circular economy; waste management; Canary Islands

### **1 Introduction**

Municipal solid waste (MSW) management is a controversial aspect in isolated environments. Not only because the production of waste grows exponentially, but because in these isolated regions the difficulties are accentuated in comparison with the mainland territories. The limitation of space, the technology of scale and the peaks of generation due to existing tourism, are clear examples of the barriers that must be overcome. For this, we must move from a linear economy to a circular economy that takes into account the priorities established by the European Union to improve the collection and treatment of municipal waste.

### **2 Objectives**

The objective of this study is to propose an efficient alternative in isolated environments, such as the Canary Islands. With the available data, we start from a concrete situation that the authors consider appropriate for study and improvement. The aim is that this study should serve to extrapolate the model to other isolated environments.

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### 3 Materials and Methods

In Figure 1, a description of the proposed model is provided. In addition to the island being thus able to comprehensively manage its waste, the aim is to reduce the surface area occupied by the landfill by almost 90%. In this way, repopulation and soil treatment work and landscaping can facilitate the environmental recovery of the area. This, without doubt, will contribute to the restoration of the native ecosystems with the introduction of local flora and fauna in order to reintegrate the landfill area into the landscape.

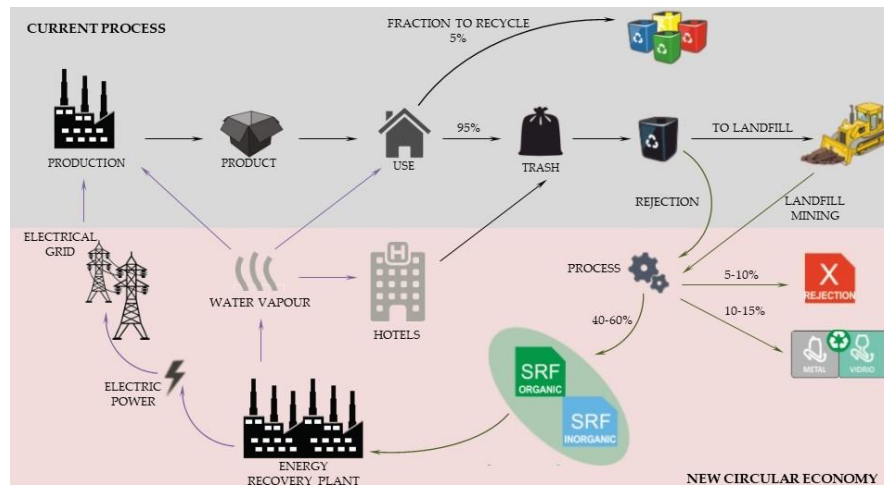


Fig. 1 Flow diagram of the waste energy recovery process proposed for La Gomera

### 4 Results

The results of this study show that the energy produced from waste is not negligible for these small isolated environments (approximately 26,000 MWh/year). In addition, recycling is also increased and GHG emissions reduced.

### 5 Conclusion

Finally, the authors have tried to put forward a solution that takes into account the circular economy model as a self-regenerative system in which the input of waste resources and emissions and energy losses are minimized by slowing, closing and reducing the material and energy loops. It is obvious that the road is still arduous and that isolated environments are still behind continental systems, but at this point it is essential to propose studies and measures that encourage awareness and action.