

Mechanical Treatment in Enhanced Landfill-Mining

An evaluation of different scenarios with a ballistic separator

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Mechanical Treatment in Enhanced Landfill Mining

An evaluation of different scenarios with a ballistic separator

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New-Mine Project

Within the EU Training Network for Resource Recovery Through Enhanced Landfill Mining (NEW-MINE Project), funded by the EU Programme for Research and Innovation Horizon 2020, the influences on the mechanical treatment were studied to enhance the sorting process of landfilled material. To conduct this study, two landfill mining case studies were performed: 1) at the Halbenrain landfill (Austria); and 2) at the Mont-Saint-Guibert landfill (Belgium). In total, approximately 500 t (in Belgium) and 374 t (in Austria) of landfilled waste were excavated and processed. Consequently, several scenarios with different preliminary conditions (input material (composition) and moisture), in a fixed pre-treatment process, were evaluated. In this way, it can be seen how sensitive the mechanical treatment is, even when innovative technology is used. Additionally, this study shows how difficult it is to obtain a high yield of "valuable" materials from old landfill waste, mainly due to the agglomeration and mingling of different kinds of waste. The valorization technologies in the NEW-MINE project aim for more flexible requirements and a higher RDF recovery rate. However, a robust enough technology is yet not proven, and until now, only lab-scale experiments have taken place.



Comparison of different scenarios for the EU's landfills (EURELCO 2016).

Publications

Journal papers (peer-reviewed):

- C. García López, A. Ni, J.C. Hernández Parrodi, B. Küppers, K. Raulf and T. Pretz, "Characterization of landfill mining material after ballistic separation to evaluate material and energy recovery potential". Detritus Journal, Special Issue: Enhanced Landfill mining, September 2019. DOI 10.31025/2611-4135/2019.13780.
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- I. N. Zaini, C. García López, Y. Gómez Rueda, T. Pretz, L. Helsen, P. Göran Jönsson and W. Yang, "Gasification of refuse derived fuel obtained from a ballistic separation process of landfill waste". At the 17th International waste management and landfill Symposium (Sardinia, Italy), October 2019.
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List of Abbreviations

MSW	Municipal solid waste
CDW	Construction and demolition waste
IW	Industrial waste
LFM	Landfill mining
ELFM	Enhanced landfill mining
EU	European Union
MSG	Mont-Saint-Guibert
Fe-metals	Ferrous metals
NF-metals	Non-ferrous metals
2D	Two-dimensional
3D	Three-dimensional
B1	Batch 1 from MSG landfill
B2	Batch 2 from MSG landfill
B3	Batch 3 from MSG landfill
B4	Batch 4 from MSG landfill
BS	Ballistic separator
S1	Scenario 1
S2	Scenario 2
S3	Scenario 3
S4	Scenario 4
MC	Moisture content
n	Number of samples
wm	Wet mass
dm	Dry mass
Dmax	Maximum diameter
RDF	Refuse derived fuel
AVA	Thermal treatment plants (waste incineration plant/ waste to energy plant/ pyrolysis plant)
DE	Germany
EAV	European municipal waste list
FEU	Combustion plant with energy recovery

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