Pelletization of refuse derived fuel as a pretreatment process for solid fuel production.

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GOALS

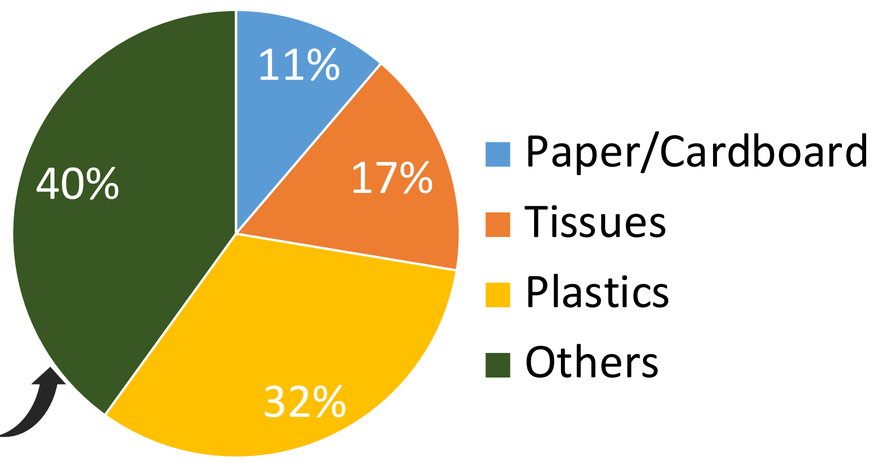
- ✓ Study of the effect of pelletizing on the characteristics of pilot-scale produced refuse-derived fuel (RDF). And evaluate the suitability of these pellets as solid fuel for energy production processes.

METHODS

- ✓ RDF from Braval, Portuguese solid waste recovery and treatment company;
- ✓ RDF morphological composition by manual sorting;
- ✓ Grinding and pelletization in a 350 kg/h pelletizer;
- ✓ Chemical and physical characterization of RDF pellets.

RESULTS

RDF morphological composition



- ✓ 32% of RDF is plastics, it has a positive effect on RDF, contributing to a lower moisture content and a higher heating value;
- ✓ Lowest heating value (LHV) of RDF pellets was 19.32 MJ/kg, which is relatively high, corresponding to the third ranking according to the solid refuse fuel quality rating system defined by the European standard EN ISO 21640:2021.

RDF pellets characterization

Parameters	Units	RDF Pellets
Bulk density	kg/m^3	698.80 ± 1.70
Mechanical durability	wt.%, ar	99.60
Fines amount (< 3,15 mm)	wt.%, ar	0.46
Length	mm	30.25 ± 0.39
Diameter	mm	8 ± 0.00
Moisture	wt.%, ar	8.27 ± 0.07
Volatile matter	wt.%, db	74.61 ± 0.29
Fixed carbon	wt.%, db	16.73 ± 0.38
Ash	wt.%, db	8.66 ± 0.10
C	wt.%, daf	50.45 ± 0.55
H	wt.%, daf	6.74 ± 0.05
N	wt.%, daf	1.02 ± 0.00
S	wt.%, daf	0.09 ± 0.00
O	wt.%, daf	41.70 ± 0.50
HHV	MJ/kg, db	20.58 ± 0.17
LHV	MJ/kg, db	19.32 ± 0.16

CONCLUSIONS

- ✓ RDF pellets had bulky density of 698.8 kg/m3, mechanical durability of 99.6%, moisture and ash content of 8.3% and 8.7%, HHV and LHV of 20.6 MJ/kg and 19.3 MJ/kg, respectively. Produced RDF pellets presented suitable characteristics for their application as a solid fuel for energy conversion.

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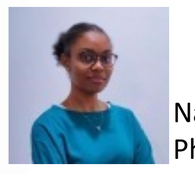

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