

RECP Best Practice Catalogue

Waste to Energy for Spent ground
Developed within the framework
of MED TEST II



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



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Best Practice - Waste to Energy for Spent ground

SECTOR:	Food & Beverage
SUBSECTOR:	Manufacture of other food products
PRODUCTS	Instant coffee
CATEGORY	Technology upgrade/Eco-innovation
APPLICABILITY	Process
COMPANY NAME	---
COMPANY SIZE	Large

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Description of the problem (Base scenario):

The company produces instant coffee from green beans. The main process consists of removing the peels, roasting, grinding and coffee making (extraction) and drying to get the instant coffee. MFCA assessment revealed that around 60% of the green beans weight is lost as spent ground. This spent ground is considered as solid waste, and is sold to animal fodders.

Description of the solution

Investigations from similar industries, it was noted that the spent ground is a good source of energy, where the energy content is around 10 GJ/ton. Introducing a biomass boiler to utilize the spent ground as fuel source shall reduce the dependency of the depleting natural gas at the company, and provide higher value utilization for the spent ground

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Economic Benefits	<p>6000 ton/year of spent ground * 10 GJ/ton = 60,000 GJ of annual energy can be extracted.</p> <p>Assuming an efficiency of recovery of 65%, thus only 39,000 GJ is recovered. This is equivalent to natural gas consumption of 963,000 m³/year (~ 11,000 MWh/year), which corresponds to around 170,000 Euro of savings per year.</p>
Environmental Benefits	<p>Reduction of natural gas by around 963,000 m³/year -14% of the baseline (~ 11,000 MWh/year) leading to 2,243 ton of CO₂ emissions being avoided.</p>
Health and safety impact	<p>None</p>

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Capital investments & financial indicators	Investment is around 300,000 Euro. Payback is estimated as 1.76 years.
Suppliers	
Other aspects	The income from spent ground sales to animal fodders shall be deducted from the feasibility.
Implementation	This measure is retained for study, pending full feasibility study.

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Replicability sectors Potato processing, fruit and vegetable processing, any food processing with remarkable organic waste having high calorific value

Aspects to investigate for replicability	Waste quantity Waste state (solid, liquid, powder,...) Calorific value for waste
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Useful resources
