Cane Trash as Boiler Fuel: Quantity and Energy

Cane trash collected for fuel from the cane crushed, trash share and recovery, its energy from moisture and dry GCV, and the bagasse it can replace.

Method: Mass and energy balance on dry matter; GCV of dry trash by laboratory test

Input parameters

Unit system: SI

Parameter	Value	Unit
Cane crushed in the season	600,000	t
Trash (dry matter) % cane	12.000	%
Share of trash recovered	40.000	%
Trash moisture as delivered	15.000	%
Dry trash GCV	17.500	MJ/kg
Bagasse GCV (as fired)	9.6000	MJ/kg

Calculated results

Parameter	Value	Unit
Dry trash recovered	28,800	t
Trash as delivered	33,882	t
Energy (gross)	504,000	GJ
Bagasse equivalent	52,500	t

Notes for this case

• Trash carries soil and silica: expect more ash, erosion and slagging. Bagasse equivalence here is on gross heat; adjust for efficiency.

Formula and method

$$M_d = C_s f_t r, \quad E = M_d GCV_d, \quad M_b = \frac{E}{GCV_b}$$

Variables

C_s	Cane crushed in the season	kg
f_t	Trash (dry matter) % cane	-
r	Share of trash recovered	-
w	Trash moisture as delivered	-
GCV_d	Dry trash GCV	J/kg
GCV_b	Bagasse GCV (as fired)	J/kg
M_d	Dry trash recovered	kg
M_w	Trash as delivered	kg
E	Energy (gross)	J
M_b	Bagasse equivalent	kg

Method and standards

Mass balance on the dry trash recovered, its gross energy from the dry GCV, and the as-fired bagasse with the same gross heat.

Assumptions and limits

- Season totals.
- The bagasse equivalent is on gross heat: the trash moisture as delivered and the different boiler efficiencies on trash and bagasse (moisture, ash) are not counted. On a net or useful-heat basis wet trash replaces less bagasse.

References

- Mass and energy balance on dry matter; GCV of dry trash by laboratory test

Report details

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Release checks	2 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/sugar-ethanol/steam-power/cane-trash-fuel-potential

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.