

DESCRIPTION

The Balance-Method is based on the mathematical solution of theoretical balance equations (for materials, substances and energy) and measured data, which are derived from conventional operating data of Waste-to-Energy plants (e.g. flue gas volume, steam production, mass of slag and ashes,...). In particular the following balance equations are used:

- Mass balance
- Ash-balance
- Carbon-balance
- Energy-balance
- O₂ consumption
- Difference between O₂ consumption and CO₂ production

OPERATING DATA

The required operating data from the WTE plant for the calculation are:

- Waste mass
- Mass of solid residues (bottom ash, filter ash and filter cake)
- Amount of flue gas
- O₂ and CO₂ content in the flue gas
- Steam production
- Steam pressure and temperature
- Temperature of the feed water
- Energy efficiency of the boiler

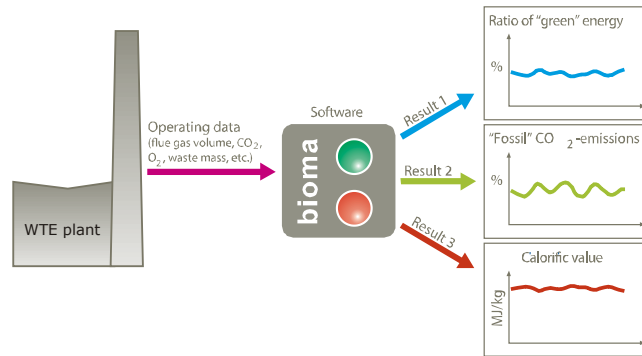


Figure 1 Schematic diagram of the Balance-Method

BIOMA SOFTWARE

- Offers automatical online data processing and reporting.
- Evaluates measurements and report if they are plausible
- Developed by Technical University of Vienna (TUV)

FIELD OF APPLICATION

Waste-to-Energy Plants (grate furnace, fluidised-bed furnace, rotary kiln).

RESULTS

The following charts illustrate the results of the Balance-Method for a WTE plant in Austria, which treats some 70% Municipal Solid Waste and 30% Industrial Wastes. The results are indicated by average values and standard deviations.

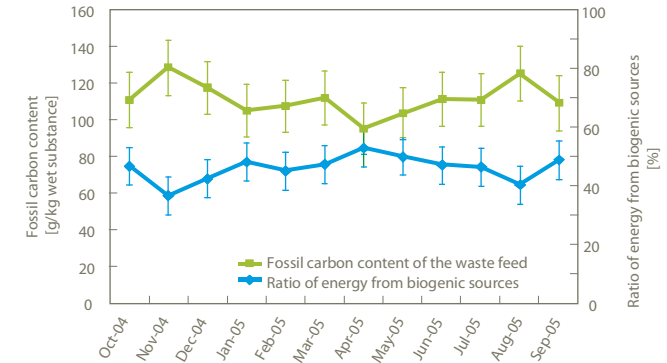


Figure 2 Trend of ratio of energy from biogenic sources and fossil carbon content of the waste feed throughout one year (monthly values)

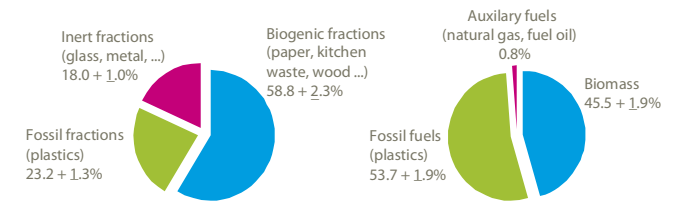


Figure 3 Ratio of mass fractions (left) and energy sources (right) of the waste feed of the WTE plant (annual values)

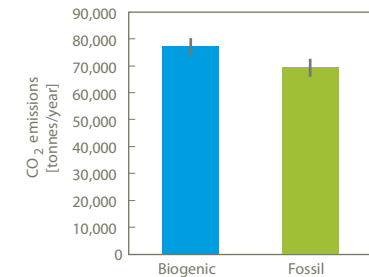
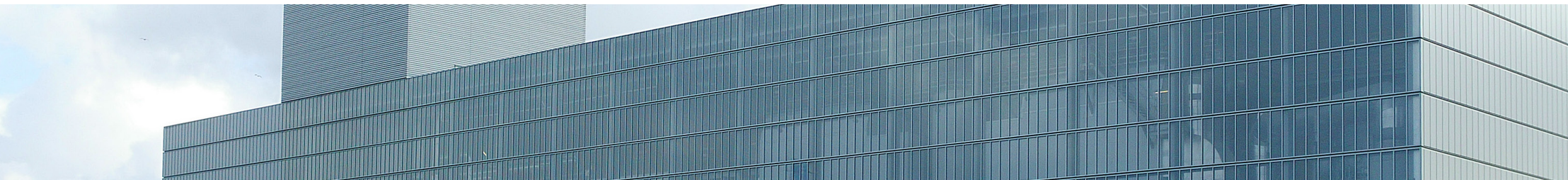


Figure 4 Annual biogenic and fossil CO₂ emissions from the WTE plant%



VALIDATION

Validated against C14 radiocarbon method in a Austrian study:

- Full scale at 3 different plants
- Large time span C14 samples (months)
- Less than 4 % relative uncertainty
- Very good correlation against C14
- Successful validation in lab scale tests (scientifically published)

PRICE

Very competitive price against C14 method and offers more results.

Price includes a yearly certificate issued by TUV.

REFERENCES

- Wels, Austria (Continues operation)
- Arnoldstein, Austria (Continues operation)
- Dürnrrohr, Austria (Continues operation)
- 3 German, 2 Swiss, 3 Belgian and 2 Danish plants (discontinues)

FURTHERMORE INFORMATION

Please contact Ramboll for further information regarding the product in Denmark and Sweden:

Christian Riber
CTR@ramboll.com
+45 5161 8314
www.ramboll.com/wte



BIOMA

Determination of CO₂ origin
in WtE Plants

Marketed in Denmark and
Sweden by Rambøll

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