

The Balance-Method was developed at the Vienna University of Technology

It determines online

- (1) The ratio of the energy output from fossil and biogenic sources
- (2) The ratio of carbon content in the waste from fossil and biogenic sources
- (3) The ratio between carbon dioxide emissions from fossil and biogenic sources from Waste-to-Energy (WTE) plants.
- (4) The calorific value of the waste feed

The advantages of the Balance-Method compared to alternative methods include:

- Cost savings of more than 90 %
- Consideration of seasonal variation in the waste composition
- Temporal resolution of the results down to daily mean values
- Less than 5 % uncertainty of the results
- No need for new measurement systems
- Retrospective determination (if necessary operating data has been recorded)

Contacts to WTE operators in Austria using the Balance-Method to label the electricity generated

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BALANCE-METHOD

Cost-effective Determination of “Green” Energy and Fossil CO₂ Emissions from WTE Plants



software for balance method

Description

The Balance-Method was developed at the Vienna University of Technology

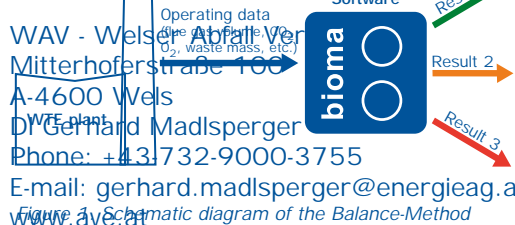
The Balance-Method is based on the mathematical solution of theoretical balance equations (for materials, substances and energy) and measured data, which are derived from conventional operating data of Waste-to-Energy plants (e.g. flue gas volume, steam production, mass of slag and ashes, ...). In particular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

- (1) The ratio of the energy output from fossil and biogenic sources
- (2) The ratio of carbon content in the waste from fossil and biogenic sources
 - Ash-balance;
 - Carbon balance;
- (3) The ratio between carbon dioxide emissions from fossil and biogenic sources from Waste-to-Energy (WTE) plants
 - Energy balance;
 - O₂ consumption;
 - Difference between O₂ consumption and CO₂ production.
- (4) The calorific value of the waste feed

The advantages of the Balance-Method compared to alternative methods include:

- Cost savings of more than 90 %
- Waste mass;
- Mass of solid residues (bottom ash, filter ash and filter cake);
- Consideration of seasonal variation in the waste composition
 - Amount of flue gas;
 - O₂ and CO₂ content in the flue gas;
- Temporal resolution of the results down to daily mean values
 - Steam production;
 - Steam pressure and temperature;
 - Temperature of the feed water;
- Less than 5 % uncertainty of the results
 - Energy efficiency of the boiler.
- No need for new measurement systems
- Retrospective determination (if necessary operating data has been recorded)

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offers automatical data processing and reporting.

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Results

Contacts at the Vienna University of Technology

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.

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BALANCE-METHOD

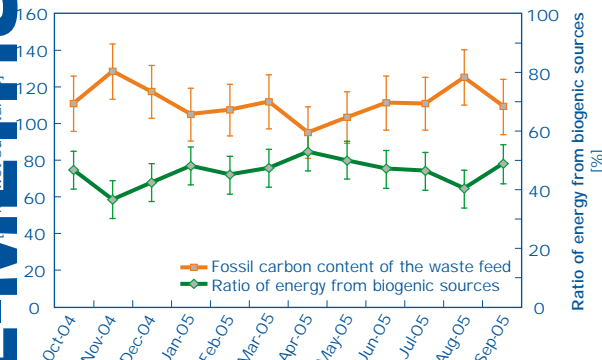


Figure 2: Trend of ratio of energy from biogenic sources and fossil carbon content of the waste feed throughout one year (monthly values)

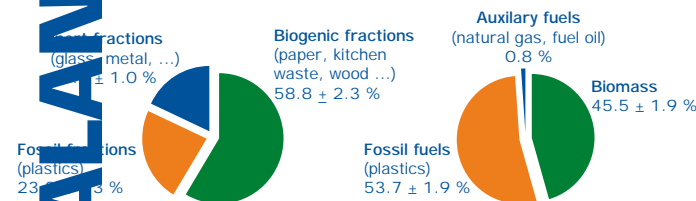


Figure 3: Ratio of mass fractions (left) and energy sources (right) of the waste feed of the WTE plant (annual values)

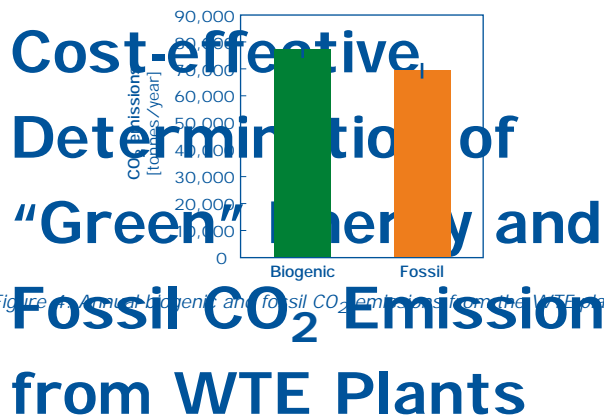


Figure 4: Annual biogenic and fossil CO₂ emissions from the WTE plant

