

# IEA Bioenergy Task 36

## Topic I – Policy Support

G. Ciceri, and G. Martignon – RSE

Angers 29 – 30 June 2012

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Topic 1 “Policy Support” is aimed at providing technical support to Policy Makers to allow a common basis for decisions on supporting actions, including incentives on renewable energy in particular in WTE

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The activity was focused on the following two objectives assigned to Topic 1:

- an overview of policies and instruments applied or proposed in Europe to promote and support energy from renewable sources
  - a technical and economical assessment of the methodologies currently available to quantify the renewable energy from mixed fuels at WTE plants, (i.e. fuels containing a biomass and a fossil fraction), such as MSW and some industrial wastes
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### Their meaning and target

- Financing tools applied at country and EU level, are instruments aimed at supporting RES and alleviating project risks
- renewable energies have much lower operating costs (no fuel costs for most technologies) but proportionately higher capital costs
- the policies are mainly directed at lowering capital costs by reducing technology, plant and construction costs, or covering generating costs through revenues

### Different instruments:

- feed-in tariffs, feed-in premiums, quota obligations are the main instruments applied in EU 27 countries to support renewable electricity
  - Investments grants seems to be the main support for most RES
  - Heating & cooling technologies in Europe
  - obligations (rather a regulatory than a financial instrument) are applied in Spain and Germany even if something is now in progress in some European countries with regard to financial supports already introduced in the national legislation on RES (UK) or under discussion (Italy) for the same purpose.
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### Need of coordination:

- Evidence appoints to the existence of numerous different national support regimes (investors and other market operators thus have to deal with a wide range of differences, in regulations), which supports the conclusion that an effective selection and coordination of financing tools at national and EU level is one the main need
- In addition there are indications that there is a legal link between financial support and mandatory biomass sustainability criteria in Europe (see the new UK legislation on RO and RHI incentives). This should not affect WtE as waste is generally regarded as sustainable according to the RES Directive

### Condition for incentives:

- Operators of eligible WTE plants are generally required to demonstrate the renewable content of their feedstock in order to show the renewable contribution to the total net energy (i.e. electricity) generated
  - This means they have to quantify the share of electricity due to the biogenic content of fuels (“Ebiogenic”), based on accepted methodologies
  - Regulations in charge in some European countries allow WTE plants to adopt a “simplified” approach, even if for specific wastes only (MSW, and solid recovered fuels (SRF), if derived from MSW) whose composition is well monitored on a national level
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### **Default incentivisation:**

the produced energy can be calculated by applying a “default percentage share” or a “deemed renewable content” (legally recognised as energy from renewable source) to the total net energy (electricity) produced.

This avoids the large cost, time and labour of the WTE plant operators having to apply a waste sampling and characterization plan to take a monitor samples at the plant

WTE plant operators may still choose to develop a sampling and characterisation plan for their waste if treating MSW or SRF with an higher biogenic content or, necessarily, if treating other mixed wastes outside the typical composition

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Currently no existing national rule identifies one unambiguous reference method for WTE plants to measure the Ebiogenic.

This is due to two factors:

- waste feedstocks used for heat and power generation in the EU may vary widely in composition
- the methodologies for measuring the biogenic content are either lacking or not sufficiently mature (from both an operational or economic viewpoint)

## Existing methods

National legislations mainly refer to those methodologies considered the most mature and supported by EU or national standards (e.g: the CEN/TS 15440):

- manual sorting
- selective dissolution
- Pre-combustion 14.C method

They need a representative sample of the wastes treated in the plant,

The Carbon- 14 method even if based on stronger scientific basis than other above-mentioned methods, has a lower level of application, probably due to its requirement for a more specialised laboratory analysis and related costs.

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## Oncoming methods

A post-combustion application of the  $^{14}\text{C}$  method allows to determine the biogenic content of the waste by measuring the  $^{14}\text{C}$  content in flue gas samples by mass and by energy

Flue gases are sampled automatically and continuously or frequently at a plant during normal operation, from locations where gases have been uniformly mixed (so that they are representative of the mixed fuel burned).

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## Some remarks

- This approach avoids limits associated with both the manual sorting and the selective dissolution methods, as the need to produce and convert to CO<sub>2</sub> representative samples of waste.
  - Sampling and analytical requirements results now in a whole cost per sample higher than that assessed for both the selected dissolution and 14C method applied to solid sample
  - This method is currently receiving increasing attention from National Authorities
  - It has been tested and compared to the mature methods mentioned above and the results appear to be in a good agreement with outputs from the selective dissolution of solid waste samples
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## Some remarks

- Up to now the method has not been widely accepted or mentioned in national regulations
  - Some standardised procedures (e.g: ASTM D6866; ISO/DIS 13833) are available based on the  $^{14}\text{C}$  measure in the flue gas  $\text{CO}_2$  which allow an assessment of the biogenic fraction mainly on a mass basis.
  - An intensive effort has been recently made in some Country (e.g. Italy) where it is now available as pre-standard
  - A standardisation work is in progress at ISO level (ISO TC 146 Air Quality), SC1 Stationary Source Emission, WG 26, Biomass and fossil derived  $\text{CO}_2$
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## Energy and mass balance method

A modeling approach based on a mass and energy balance was recently implemented (software tools are available in Italy, Austria and Sweden) and tested on some WTE plants:

- This approach appears to be quite promising in terms of: performance, due to an observed good correlation with result achieved by applying the selective dissolution and the  $^{14}\text{C}$  methods)
  - It present limited costs, being waste sampling & analysis-free (it uses as input waste reference data from literature and plant operational data usually recorded in a WTE plant)
  - It allows the on-line monitoring of the biogenic energy produced by a WTE plant
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