ARCADIS BELGIUM

Assessment of the options to improve the management of bio-waste in Europe

Study in collaboration with Eunomia Research and Consulting

Laurent Franckx
Mike Van Acoleyen

Overview of this presentation

- Objective of the study
- General approach
- Methodology for the baseline construction
- General assessment
- Step forwards (including modelling)

ARCADIS BELGIUM

Laurent Franckx
Mike Van Acoleyen

Objective of this study

- Look into ways of improving bio-waste management in EU
- Provide an appropriate assessment of policy options, including environmental, economic and social impacts, as well as prospective risks/opportunities.
- Policy options to consider according to ITT:
  - setting EU-wide compost standards;
  - setting EU-wide compost standards and EU-wide recycling targets for bio-waste (common to all Member States);
  - setting EU-wide compost standards, combined with recycling targets to be set for individual Member States (or for groups of member states)
  - + 4 th

ARCADIS BELGIUM

General approach

- development of baseline scenario by extrapolating current situation and developments on EU level and in Member States by 2020, assuming:
  - no additional specific measures will be taken on bio-waste
  - full implementation of EU legislation and announced national policies
- baseline based on publicly available data has been submitted to stakeholders for verification and validation
- the 4 policy scenarios withheld will be compared with the baseline projections
- impacts will be analysed according to EC Guidelines for Impact Assessment

ARCADIS BELGIUM

Laurent Franckx
Mike Van Acoleyen

Scope of the study

- Waste from food industry:
  - Member States do not report sufficiently on waste generation from this specific sector
  - almost no information on treatment
  - case study based approach
- Compared to previous studies:
  - biowaste, not biodegradable municipal waste
  - EU27 rather than EU15
  - new legislative developments
  - new data
  - new estimates of costs of different waste management options

ARCADIS BELGIUM

Data collection

- official reporting requirements (e.g. waste statistics regulation) are very limited to cover bio-waste generation and treatment => secondary data sources
- data are often inconsistent across sources
- publicly available data often refer to biodegradable municipal waste, not to biowaste
- definitions are often idiosyncratic and relation with biowaste is unclear
- estimation methods are rarely specified and change over time => margins of error are not known
- data on recycling do not always specify method used

ARCADIS BELGIUM

Laurent Franckx
Mike Van Acoleyen

Development of a baseline scenario

What could happen if…

- Demography would evolve as predicted
- Economy would evolve as predicted
- Policy would evolve as announced

Based on the
- Actual generation of bio-waste
- Actual distribution of bio-waste treatment

Assess possible evolutions for
- 2007 -> 2020

ARCADIS BELGIUM

Baseline scenario data

Generation of bio-waste:

Generation of municipal waste
Ratio biodegradable waste/municipal waste
Ratio bio-waste/biodegradable waste
or bio-waste/municipal waste

Demographic evolution

Economic evolution (through GDP)

Actual distribution of bio-waste over:
Landfill, incineration, MBT, AD, composting, home-composting

Degree of collection coverage

ARCADIS BELGIUM

Laurent Franckx
Mike Van Acoleyen

Baseline scenario assumptions at the start

•Link between municipal waste **generation** and **demography**: linear.

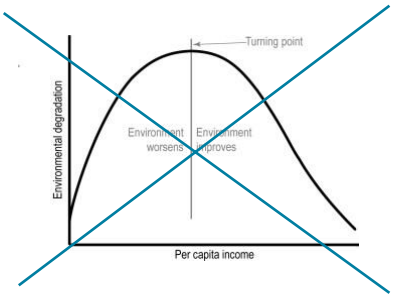
•Link between municipal waste **composition** and **economy** : evolving towards western European cases.

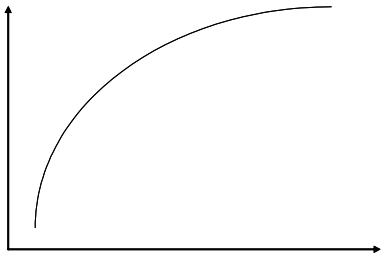
•Link between average municipal waste **generation** and **economy**: different possibilities (next slide)

•Link between **collection** coverage and applicable **treatment** methods:
-Not collected = not centrally treated
(~ home composting, illegal treatment)
-Source separated collection, mixed collection
lead to different treatment methods

ARCADIS BELGIUM

Baseline scenario assumptions at the start





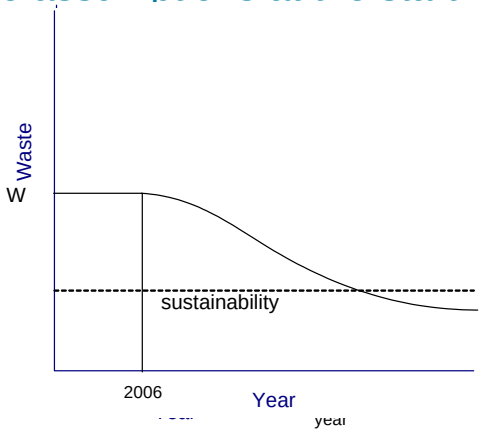
Average municipal waste generation:
No traditional Kuznetz curve evolution for municipal waste generation
But (empirically proved) evolution towards a maximum + stabilisation

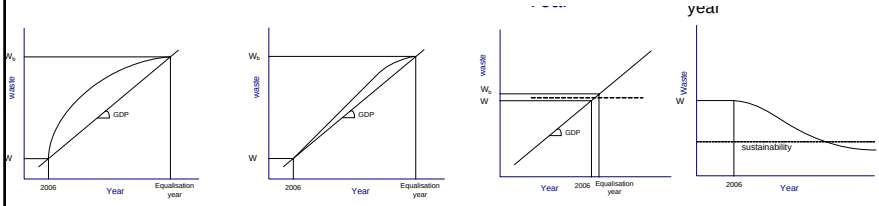
ARCADIS BELGIUM

Laurent Franckx
Mike Van Acoleyen

Baseline scenario assumptions at the start

- Negative decoupling
- Coupled
- Stabilised
- Decoupled





ARCADIS BELGIUM

Assumption; Western European case on municipal waste composition

selective collected fractions	selective collection %	mixed waste composition %	fractions in mixed waste	**total generation %**
glass	8,01	2,58	glass	**6,46**
paper cardboard	20,57	10,56	paper cardboard	**17,71**
plastics	2,46	13,88	plastics	**5,72**
vegetable, fruit and garden	12,97	39,43	bio waste	**35,90**
green waste	21,52			
beverage cartons	0,42	3,62	beverage cartons	**1,33**
textiles	1,53	4,51	textiles	**2,38**
dipers	0,10	9,03	dipers	**2,65**
construction and demolition	19,56	0	construction and demolition	**13,98**
small hazardous waste	0,73	0,55	small hazardous waste	**0,68**
metals	2,95	15,84	other	**13,19**
wood	5,48			
tyres	0,10			
sheet glass	0,39			
WEEE	1,97			
reusable waste	1,24			
	100,00	100,00		100,00
weighing		kg/inh	%	
mixed household waste 2006		153	28,54	
selective collected household waste 2006		383	71,46	
		536		

Municipal bio-waste generated = 35,9% of municipal waste generated

ARCADIS BELGIUM

Laurent Franckx
Mike Van Acoleyen

Baseline scenario MS policy assumptions

•Targets are being reached
-Landfill target for biodegradable waste
-Recycling targets
-MS policy targets: eg. collection coverage targets, separate collection targets …

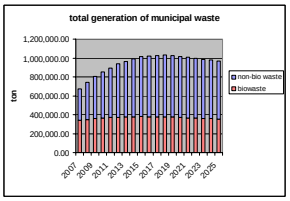
•Planned investments are being realised
-Investments in collection infrastructure
-Investments in centralised treatment (eg incinerators, MBT-plants, sanitary landfills, AD, composting plants…)
-Home composting and prevention plans

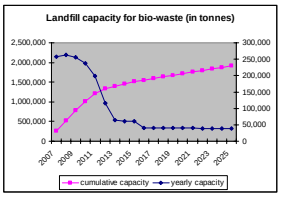
•Difficulty : how to disconnect bio-waste policy from biodegradable waste policy and from general waste policy

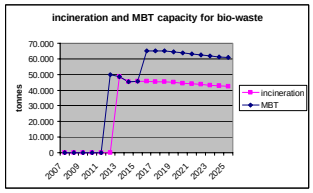
ARCADIS BELGIUM

Baseline scenario results

•For each Member State
-Assessment of the evolution in generated municipal bio-waste
-Assessment of the evolution of capacity used for treating bio-waste







ARCADIS BELGIUM

Laurent Franckx
Mike Van Acoleyen

General first assessment (1)

- A lot of uncertainty surrounds current situation
- Existing harmonised reporting requirements are not adapted to data needs
- Policy intentions of Member States are not always clearly stated and are changing
- Impact of Landfill Directive:
  - some Member States concentrate on waste streams that are the easiest to divert
  - some Member States choose cheapest option

ARCADIS BELGIUM

General first assessment (2)

- Wide variety in policy approaches:
  - preferences vary across Member States
  - some benefits and costs are country specific:
    - alternatives to energy recovery,
    - displaced energy sources,
    - sunk costs,
    - climatic conditions and soil quality,
    - excess manure supply

ARCADIS BELGIUM

Laurent Franckx
Mike Van Acoleyen

Recycling targets

A target only makes sense if it can be measured

New reporting and monitoring requirements for member states

For the calculation of the quantities that are recycled, the following fractions can be included:

- The inputs to compost production (minus rejects)
- The inputs to AD (minus rejects)

Compost should

- Comply with a product standard
- Be used as a product

Recycling target is defined in relation to biowaste generated in a given year

ARCADIS BELGIUM

Proposed approach to scenarios

Three scenarios for immediate analysis:
-Compost standard
-Compost standard + high uniform target
-Compost standard + low uniform target

After analysis of these first three scenarios, the 4th scenario will be chosen.

In case it would be chosen to go forward with a “two tier” compost standard, our modelling work will assume that all compost complies with the less demanding tier.

ARCADIS BELGIUM

Laurent Franckx
Mike Van Acoleyen

Cost benefit analysis

- impact of switches in management
- financial modelling:
  -cost of capital incorporates risks
  -no explicit calculation of cost of separate collection
  -net of sales of output (compost, electricity)
- environmental modelling: financial cost on the impacts to air, land and water of the benefits and damages and benefits associated with waste management
  - uses Eunomia's Atropos™ model

ARCADIS BELGIUM

Details of environmental model

- based on detailed mass and energy flows for existing facilities and technologies specific performance data.
- treatment systems to be modelled in terms of their:
  -performance characteristics in respect of, e.g., abatement of noxious gases, use / generation of energy, etc.; and
  -responsiveness to changes in input wastes
- emissions are attributed unit damage costs based upon the nature of the emission and (where relevant) the likely location of the plant in relation to local populations.
- emissions of greenhouse gases and impacts upon air quality include indirect impacts (avoided impacts associated with energy generation and materials recycling).
- data regarding nature of impacts to soil and water quality is less robust.

ARCADIS BELGIUM