

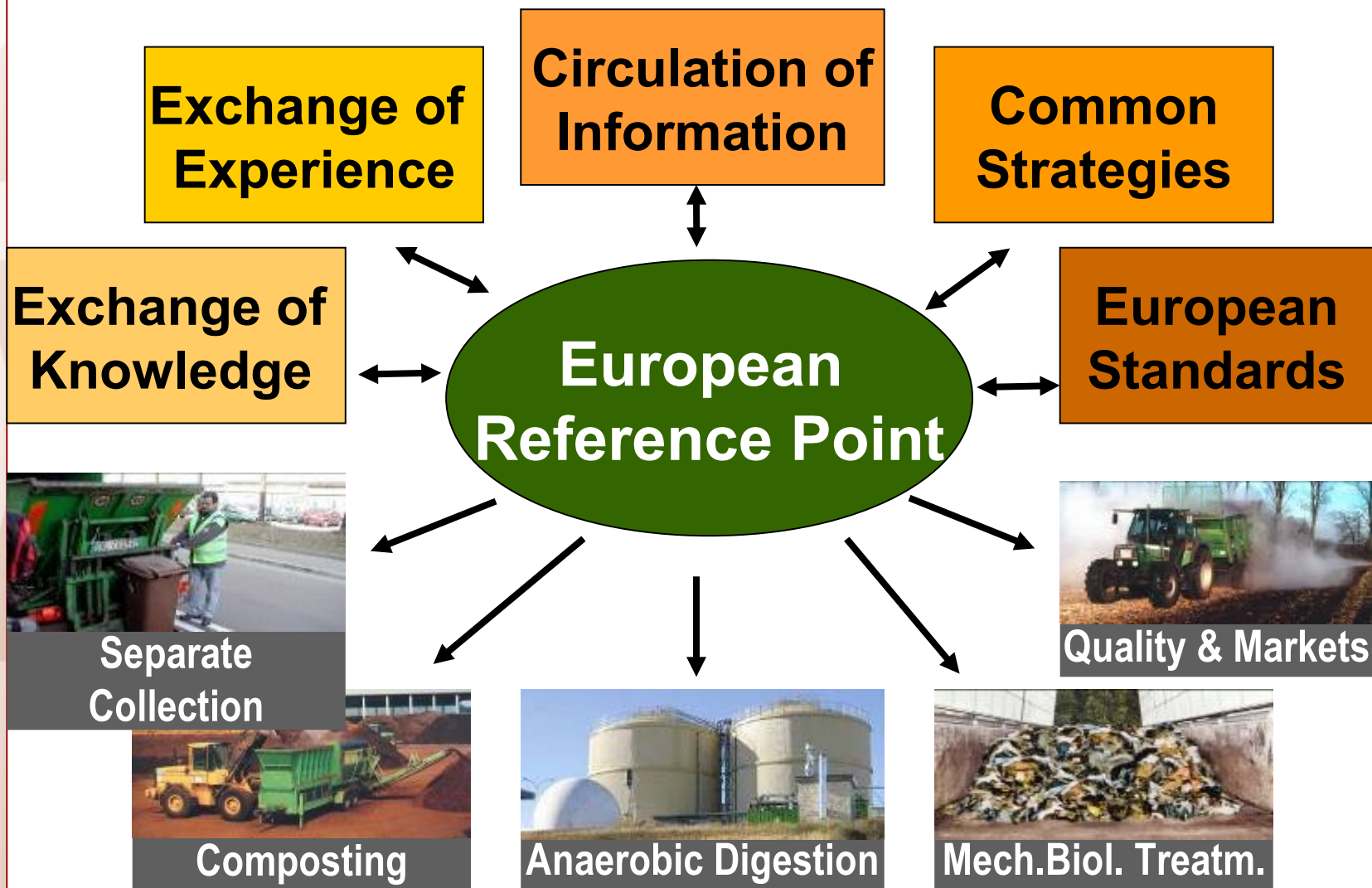


# The Role of Biodegradable Waste Management in Europe

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# About ECN

# About the European Compost Network ECN



⇒ Sustainable solutions for the organic residues stream

# Some ECN Projects

**ECN Workshops e.g.:** Cost effective separate collection; Animal By-Products Regulation; Use and markets of compost; Odour management; Anaerobic Digestion

## 6 ECN Working groups for important topics like:

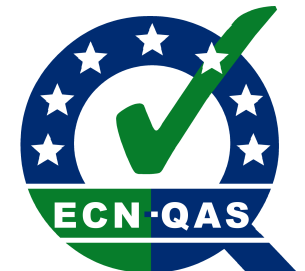
- WG European Policy (Biowaste, Animal By-Products, IPPC..)

- WG Anaerobic Digestion

Quality parameter and analysis methods, wet/dry technologies, co-digestion with manure and energy crops, gas upgrading, use of digestates, emissions

- WG Quality Assurance and Standards

ECN prepares European QA System for compost and digestion residues with quality parameter, analysis, product control



## The Role of Biodegradable Waste Management in Europe

- Situation and challenges in Europe
- Policy and programmes of the European Commission
- Potential of biodegradable waste in Europe
- Quality assurance of compost
- Perspective - What do we need?

- Energy demand in Europe and the world (China, India ..) increases (60 % more in the next 30 years)
- Global consumption of resources increases rapidly too
- Energy costs and import dependency grow (EU 2005: 54 %; estimation 2030: 65 % import energy)
- Climate change needs urgent reactions and activities
- 45 % of the European soils show low organic matter contents and reduced fertility
- 90 % of the EU27 shows a rural settlement type = demand for decentralize concepts including agriculture

Rethinking is needed in policy, economy, commerce and public:

<b>From disposal</b>	<b>Past</b> →	<b>to recycling</b>
<b>From waste</b>	<b>Now</b> →	<b>to resource</b>
<b>From organic residues</b>	<b>Future</b> →	<b>to energy-, nutrient- and humus resources</b>

## Resources management!

**Sustainable and effective management of our resources in closed loops will become the key factor for the future.**

# Policy and Programmes of the European Commission

The EU has issued the “**Sustainable management of natural resources and the environmentally suitable management of waste**” as one of the 4 main priorities in the Environmental Action Programme. In details:

- EU Landfill Directive (landfill gases endangering climate)  
⇒ Diversion of organic waste from landfills
- EU Waste Framework & Recycling Strategy  
⇒ Recycling efforts even for biodegradable waste
- EU Climate Change Programme (meeting Kyoto targets)  
⇒ CO<sub>2</sub> mitigation and sequestration in soils\_
- EU Soil Protection Strategy (Soil fertility)  
⇒ Organic matter from agriculture & waste management

# Policy and Programmes of the European Commission

- EU Biomass Action Plan (BAP) from 2005  
⇒ Targets, promotion and research for energy, heat and fuels from biomass
- EU target: Renewable energies (RES)  
⇒ 20 % energy from renewable sources until 2020
- EU target: Biofuels  
⇒ 10 % compulsory blending of biofuels until 2020
- EU Programme for the development of rural areas (2007-2013)  
incl. complementary measures for renewable energies
- CAP/Cross Compliance Ordinance  
⇒ Conservation of the ecological status of agricultural soils (humus management)

## EU Landfill Directive

⇒ diverting targets for the reduction of biodegradable waste

According to the Directive 1999/31/EC on landfill of waste, Member States must reduce the amount of biodegradable municipal waste going to landfill

- to 35 % of 1995 level by 2016 (EU15)/ 2020 (EU12)

**Note:** Biodegradable waste means any waste that is capable of undergoing anaerobic or aerobic decomposition, such as food and garden waste, paper and cardboard.

## EU Waste Framework Directive (WFD)

WFD (2008/98/EC) published Dec. 2008

### Definitions (Article 3)

Biowaste means biodegradable garden and park waste, food and kitchen waste from households, restaurants, caterers and retail premises and comparable waste from food processing plants

### Waste hierarchy (Article 4)

- a) Prevention
- b) Preparing for re-use
- c) Recycling
- d) Other recovery, e.g. energy recovery
- e) Disposal

## End-of-waste status (Article 6) (EoW)

- (a) the substance or object is commonly used for specific purposes;
- (b) a market or demand exists for such a substance or object;
- (c) the substance or object fulfils the technical requirements for the specific purposes and meets the existing legislation and standards applicable to products; and
- (d) the use of the substance or object will not lead to overall adverse environmental or human health impacts.

The criteria shall include limit values for pollutants where necessary and shall take into account any possible adverse environmental effects of the substance or object.

## Re-use and Recycling (Article 11)

Member States shall

- promote re-use of products
- promote high quality recycling
- set up separate collection for at least paper, metal, plastic and glass by 2015
- take measures to achieve the recycling target of minimum 50 % for paper, metall, plastics and glass by 2020

## Bio-waste (Article 22)

Member States shall take measures, as appropriate, and in accordance with Articles 4 (waste hierarchy) and 13 (protection for human health and the environment), to encourage:

- (a) the separate collection of bio-waste with a view to the composting and digestion of bio-waste;
- (b) the treatment of bio-waste in a way that fulfils a high level of environmental protection;
- (c) the use of environmentally safe materials produced from bio-waste.

## Bio-waste (Article 22)

The Commission shall carry out an assessment on the management of bio-waste with a view to submitting a proposal if appropriate.

The assessment shall examine the opportunity of setting

- minimum requirements for bio-waste management and
- quality criteria for compost and digestate from bio-waste, in order to guarantee a high level of protection for human health and the environment.

➔ Impact Assessment on the Options to Improve the Management of Bio-waste in the European Union

# Policy and Programmes of the European Commission

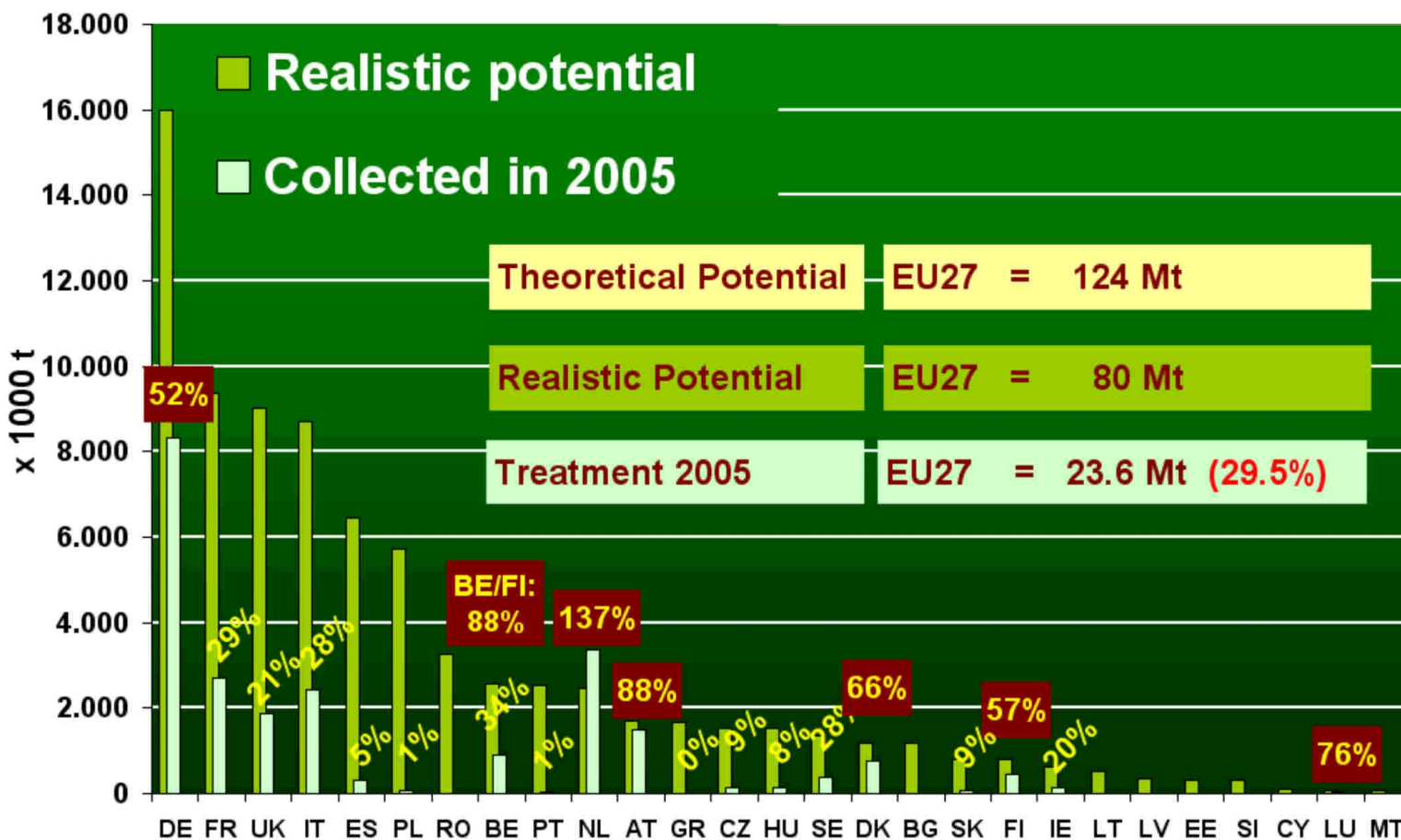
- Feb. 2008: IPTS Report on “End of Waste Criteria for Compost”
- Feb. 2008: ECN Report “Compost production and use in the EU”
- Dec. 2008: Publication of the **Greenbook** on the Management of Biodegradable Waste in the EU (consultation until March 2009)
- June 2009: Conference “Bio-Waste – Need for EU-Legislation?”
- Sept. 2009 Draft final report “Assessment of the Options to Improve the Management of Bio-Waste in the European Union”
- End 2009 Publication of the final “**Impact Assessment**”
- 2010 legislative proposal on biodegradable waste by the EU Commission

## End-of waste criteria / EU Bio-waste Directive

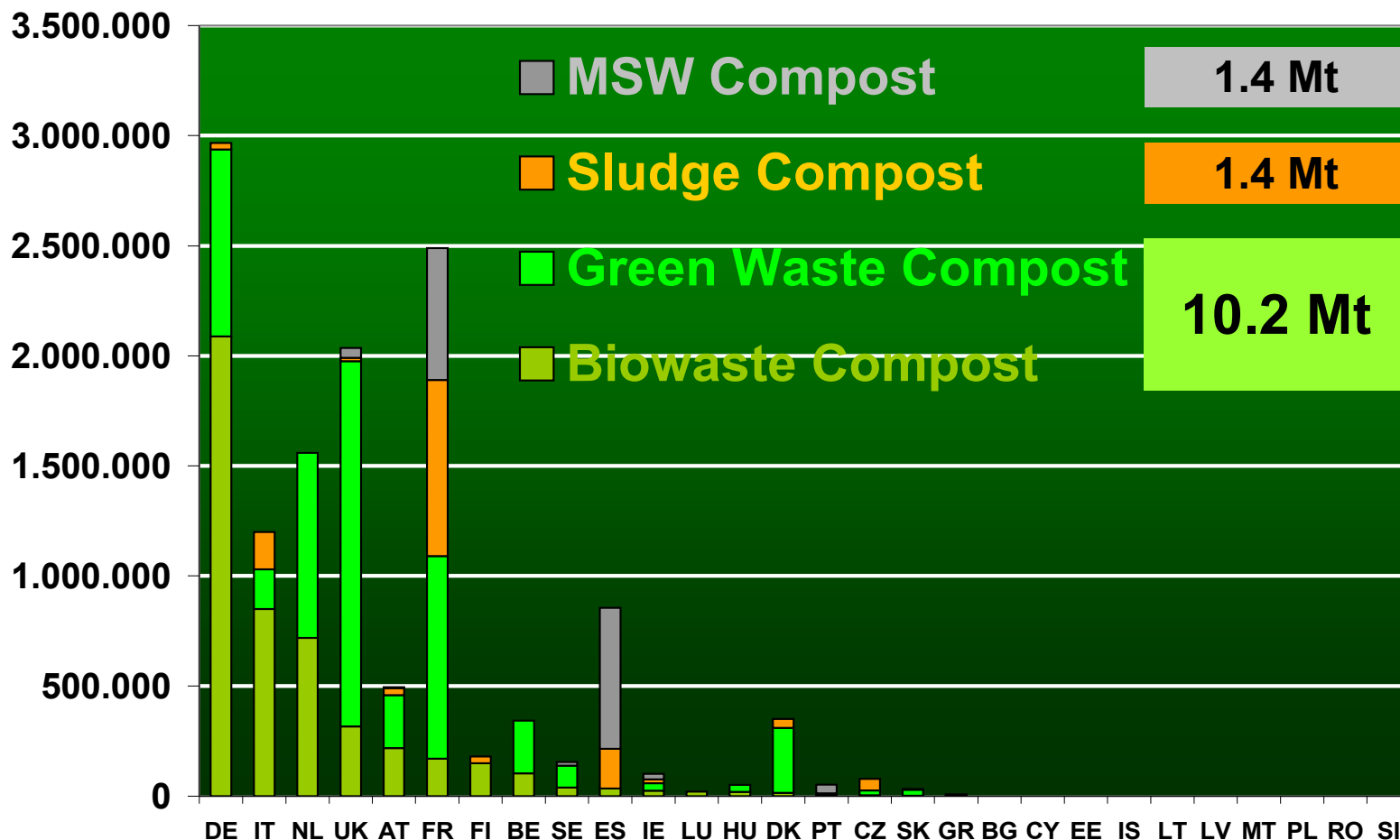
# Potential of Biodegradable Waste in EU

Quelle: Barth et al. 2008

# Potential of Biodegradable Waste in EU 1/7



Quelle: Barth et al. 2008



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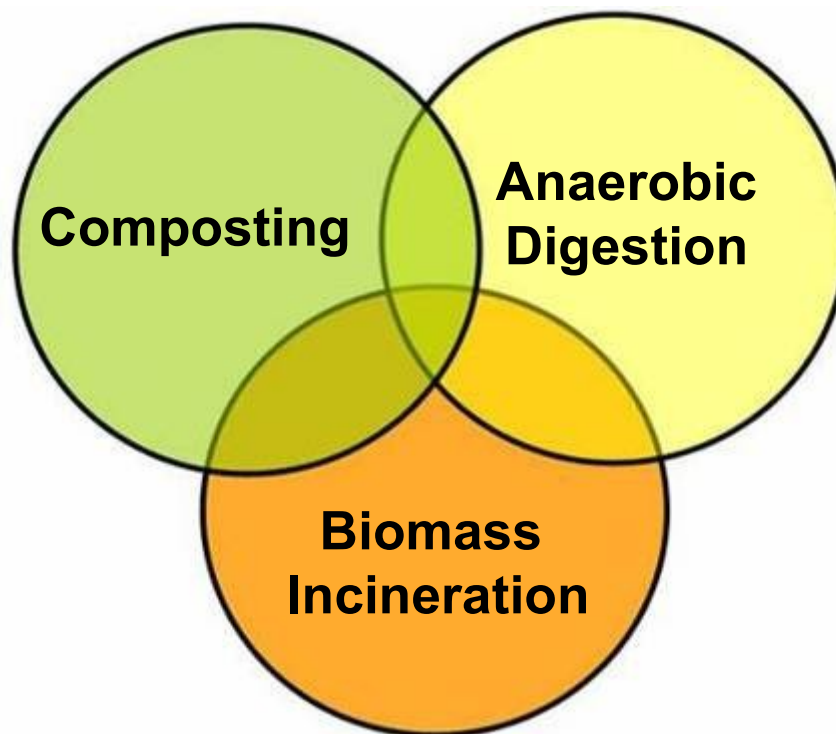
**80 million tonnes** biowaste/year realistic collection potential

From this, there is the potential to create over  
**35 million tonnes of compost a year**

**This equates to:**

- 8 Mio. tonnes of CO<sub>2</sub> equivalent sequestered in soil
  - Saving >300,000 tonnes of CO<sub>2</sub> equivalent through substitution of NPK fertiliser
- ⇒ Enough to drive around the world 40,000 times!

# Options of Biodegradable Waste Management



Source:  
B. Kehres  
BGK, 2007

**Germany:** 10 Mio. t of organic waste from households, gardens- + parks

**Ca. 8.0 mio. tons**

**Composting**

(biowaste, garden- & park waste)

**Ca. 0.5 mio tons**

**Anaerobic digestion**

(biowaste, catering waste, grease trap)

**Ca. 1.0 mio. tons**

**Biomass incineration**

(Garden & park residues, residual wood)

# Recycling of biodegradable waste by composting in Europe (2005)

Composting of separately collected  
organic wastes of households, gardens,  
parks and commerce



Ca. 1800 sites of which 40 % treat only green waste

- Annual capacity ca. 19 Mio. t
- Additionally around 800 small agricultural co-composting plants mainly in Germany and Austria
- Large potential for agriculture in accession countries and Austria, Scandinavia, Ireland, Spain and Portugal

**Target: Manufacturing of a PRODUCT for fertilisation, soil improvement and humus management.**

# Status Digestion of Organic Residues & Feedstocks in EU (2005)

7/7



**Target: Production of renewable energies and biofuels (Sweden, Switzerland) and organic fertilisers.**

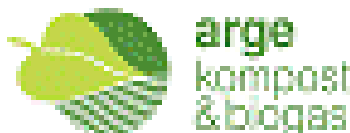
- 100 large sites with 4 million tons capacity for organic waste
- Additionally 4000 agricultural digestion and co-digestion sites (mainly Germany, Austria) for organic waste, agricultural residues and energy crops)

# Quality Assurance of Compost

# Quality Assurance and Labels for Compost and Digestion Residues



COMPOSTING ASSOCIATION CERTIFIED



**QAS Monitoring in total:  
800 plants with capacity of  
11 million tons composting and  
2.5 million tons digestion**

# Quality Control Tools in Member States 2/10

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**Quality assurance in place** (AT, BE, DE, IT, LU, NL, SE, UK)  
with quality standards and external control and evaluation only  
in 8 countries  $\Rightarrow$  2/3 of the European compost production

**QA in preparation** (HU with pilot trial of 5 plants, IE, CZ, DK)

**National compost standard and product registration**  
(FI, FR, ES)

**No substantial activities in compost quality monitoring**  
(BG, CY, EE, GR, LT, LV, MT, PL, PT, RO, SI, SK)

	Standard [mg/kg DM]	Cd	Cr	Cu	Hg	Ni	Pb	Zn
<b>EU 2008</b>	Organic Farming	0,7	70	70	0,4	25	45	200
<b>Netherl.</b>	Compost (2008)	1,0	50	90	<b>0,3</b>	<b>20</b>	100	290
<b>Austria</b>	Class A (Agriculture)	1,0	70	150	0,7	60	120	500
<b>Belgium</b>	Agricultural Ministry	1,5	70	90	1,0	<b>20</b>	120	300
<b>Germany</b>	Biowaste Ordinance	1,5	100	100	1,0	50	150	400
<b>Spain</b>	Class B (Standard)	2,0	250	300	1,5	90	150	500
<b>Denmark</b>	Waste/Sludge in Agric	0,8	100	60	0,8	30	<b>1000</b>	<b>4000</b>
<b>EU 2004<sup>1</sup></b>	Proposal (90 <sup>th</sup> ile + 50%)	1,3	60	110	0,45	40	130	400
<b>EU 2006</b>	Ecolabel Soil improver	1,0	100	100	1,0	50	100	300
<b>France</b>	NF U44-051/U44-095	<b>3,0</b>	120	300	<b>2,0</b>	60	180	600
<b>Lithuania</b>	Registered org. Fertil.	<b>3,0</b>	-	<b>600</b>	<b>2,0</b>	100	150	1500

## Targets of Quality Assurance Schemes

- Specification of products with a guaranteed homogenous quality
- Enhancement of product quality and operation quality
- Guarantee for a successful use of the products
- Deregulation and recognition of certified products by legal authorities, in agricultural systems and by food processing industry
- Promotion of the re-use of waste "from waste to product"



## Common view of European compost producers:



+



=



**Separate  
collection of  
organic waste  
(Clean source)**

**Quality  
Assurance**

**Product status for  
compost & digestate**

## Targets of ECN-QAS

- Harmonisation of the compost quality across Europe
- Harmonisation of quality assurance schemes across Europe
- Assistance to build up national quality assurance schemes
- Assurance and monitoring of high quality compost products in Europe




The ECN-QAS Manual contains:

- Requirements for national QAS
- List of input materials
- Operation Quality requirements
- Product quality parameter
- Certification procedure




If the compost plant and product fulfil the requirements of the national and European QAS the ECN-QAS label can be awarded.


## Operation quality

- 
- suitable input materials in accordance with national and European regulations.
  - operation control by plant visits of independent quality managers.
  - control by independent sample takers.

## Independent analysis and declaration of the product quality

- 
- 2 - 12 times a year according to the quality guidelines, depending on the amount of input material.
  - control and sanctions by an independent quality committee of the NQAO.
  - certification with product declaration according to regulations

## Application recommendations

- 
- application recommendations based on national and European legal requirements.
  - application recommendations due to good fertilisation practice.

## A **PUSH** and **PULL** approach



- **Binding targets drive the recycling sectors**
  - Targets in the Landfill Directive, Packaging and Packaging Waste Directive and renewable energy sources in RES-Directive
  - Have led to investment in infrastructure and changes in practices
- **Regulatory “bridge” needed to implement Article 22 (Biowaste) in the WFD and provide framework for sustainable biowaste recycling**
  - Targets for biowaste treatment needed to drive this
- **Example approach in Sweden**
  - National target for % of separately collected biowaste sent for biological treatment

## Main elements of EU Quality Assurance Schemes:

- Specified **clean input biowaste** feedstocks from source separation schemes only
- **Quality managed and monitored process** providing safe and fit for purpose products
- **Standardised high quality** with product certification by independent organisation
- **Meeting end of waste** criteria
- **Information** on product compost properties and appropriate application

**This helps to build customers' confidence and promotes recycling of organic matter and nutrients**

**➔ "converting waste to product"**

## Compost marketing is confidence marketing

- **Range of value added products**
  - Marketed to various sectors
- **Achieving customer confidence**
  - Standardised high quality product
  - Independently controlled
  - Clean source material
- **Agricultural market** (> 50 % of EU compost production)
  - Part of certified international food production schemes which requires traceability to clean source materials



**Confidence of both private and professional customers requires separate collection**

## Biowaste legislation:

1. Setting binding biowaste recycling **targets**
2. Requiring **quality assured processing** of separately collected biowaste feedstocks according to a set of standards
3. Including **end of waste** criteria

To support sustainable marketing of quality products

# European Compost Network

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**Thank you!**

[www.compostnetwork.info](http://www.compostnetwork.info)

**Info of the EU Commission on biowaste**

<http://circa.europa.eu>

<http://susproc.jrc.ec.europa.eu>