Seminar
Composting and Compost use in Organic Farming

How compost and digestate will be regulated by European Regulation?

Overview about the future EU Fertilising Product Regulation and the Organic Farming Regulation

Dr. Stefanie Siebert
European Compost Network ECN e.V.
siebert@compostnetwork.info

Overview

- European Compost Network
  - Vision and objectives
  - Membership and work structure
  - EU work structure and policy areas

- Compost and Digestate in the European Circular Economy

- European Legislative Approach
  - EU Fertilising Product Regulation
  - EU Organic Farming Regulation

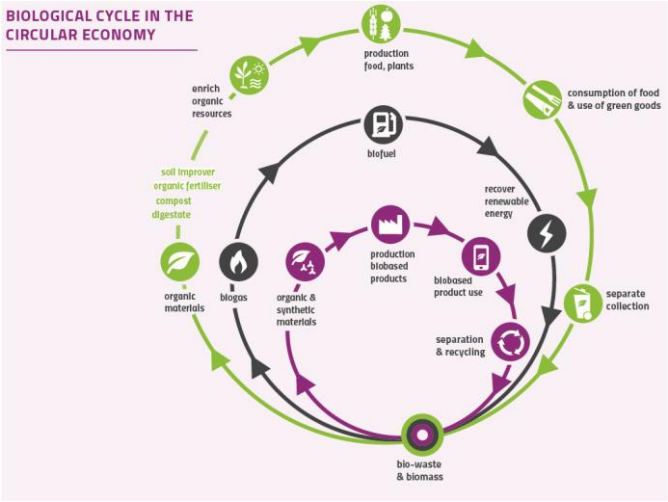
- Quality Criteria for Compost and Digestate

ECN

European Compost Network

ECN's vision

"Living well within the limited resources of the planet respecting the organic cycle"



ECN is the leading European membership organization promoting sustainable recycling practices in composting, anaerobic digestion and other biological treatment processes of organic resources.

European Compost Network

ECN's Objectives:

1. **FAVOURABLE LEGAL FRAMEWORK – EUROPEAN POLICY**
   Achieve an EU legal framework that supports separate collection, biological treatment of organic residues and production and use of quality assured compost and digestate products.

2. **MARKET DEVELOPMENT**
   Achieve favourable market conditions across Europe for separate collection, biological treatment and use of compost & digestate products.

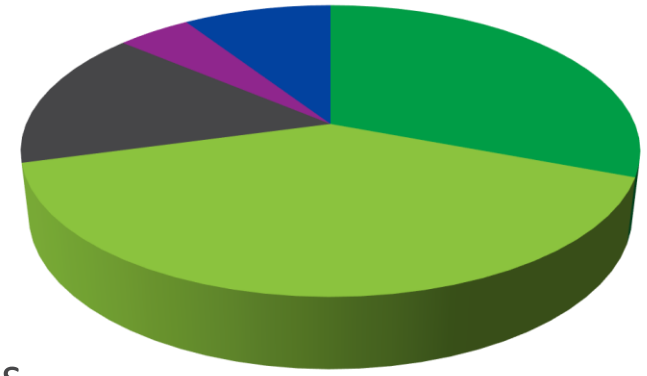
3. **IMPLEMENTING QUALITY ASSURANCE SCHEMES**
   Achieve Europe wide implementation of compost and digestate quality assurance schemes, use ECN-QAS as a benchmark

ECN

European Compost Network

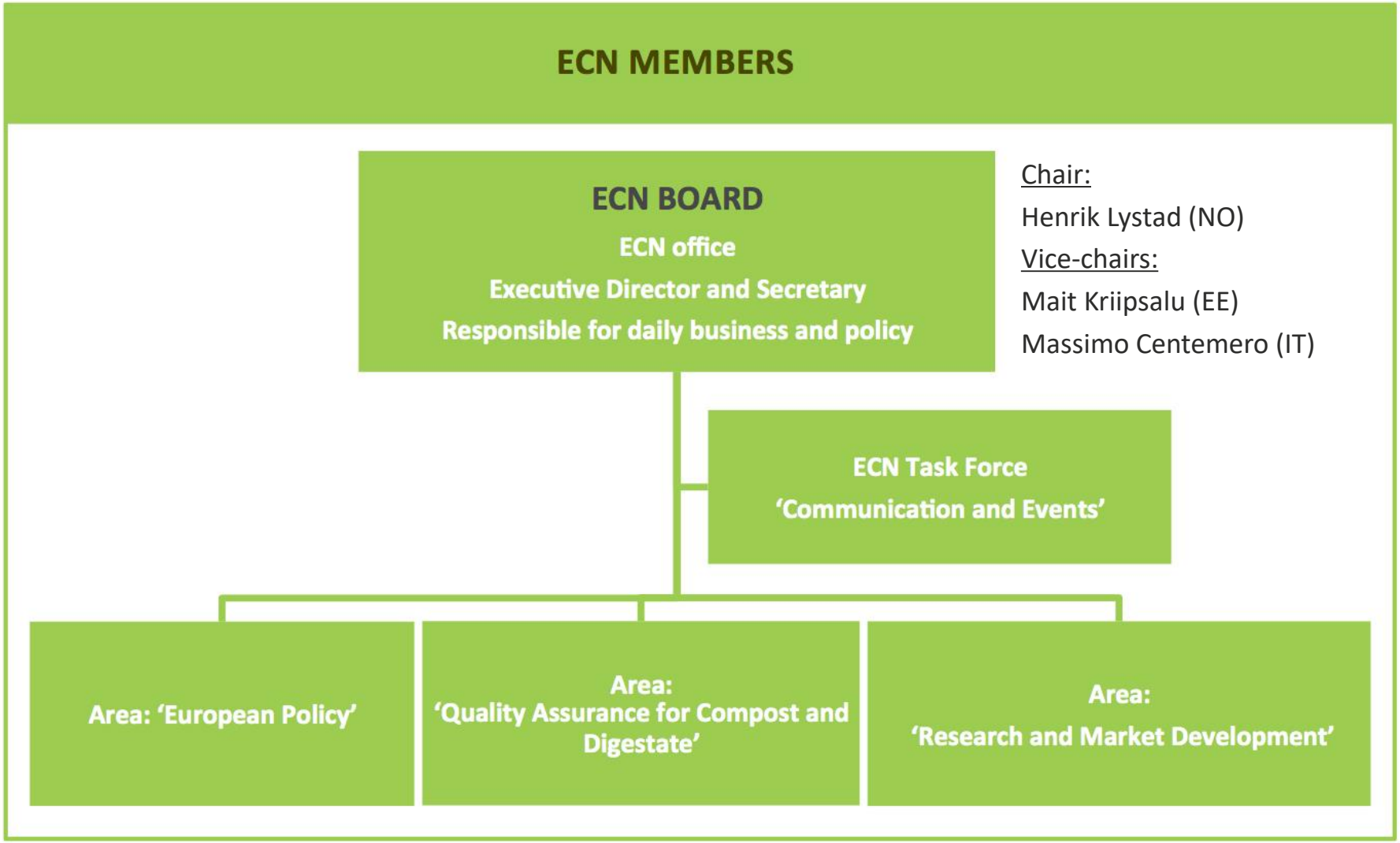
Status of ECN Membership

- 68 Members from 30 Countries
- ECN represents more than 3.500 treatment plants (composting and anaerobic digestion) with more than 33 M tpa treatment capacities
- Compost production of 12-15 M tpa, used as
  - Organic Fertiliser
  - Soil Improver
  - Mixing component in Growing Media



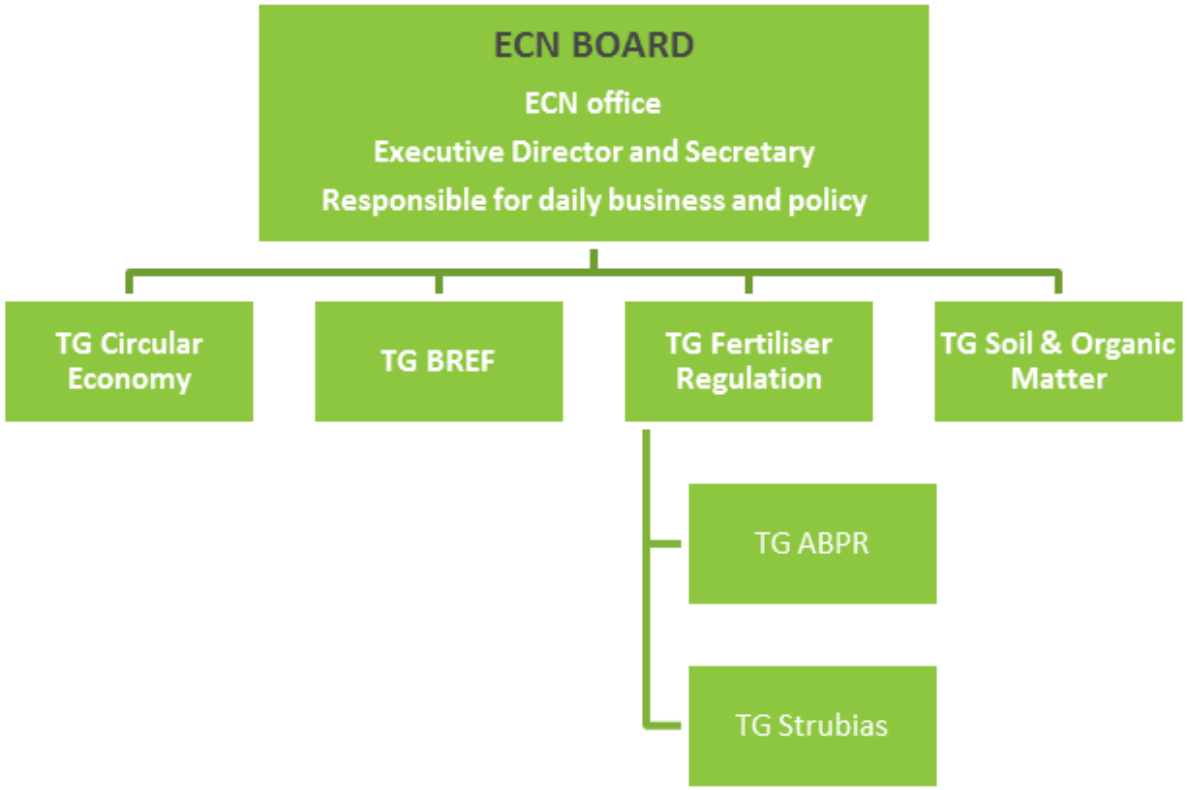
ECN

ECN's Work Structure

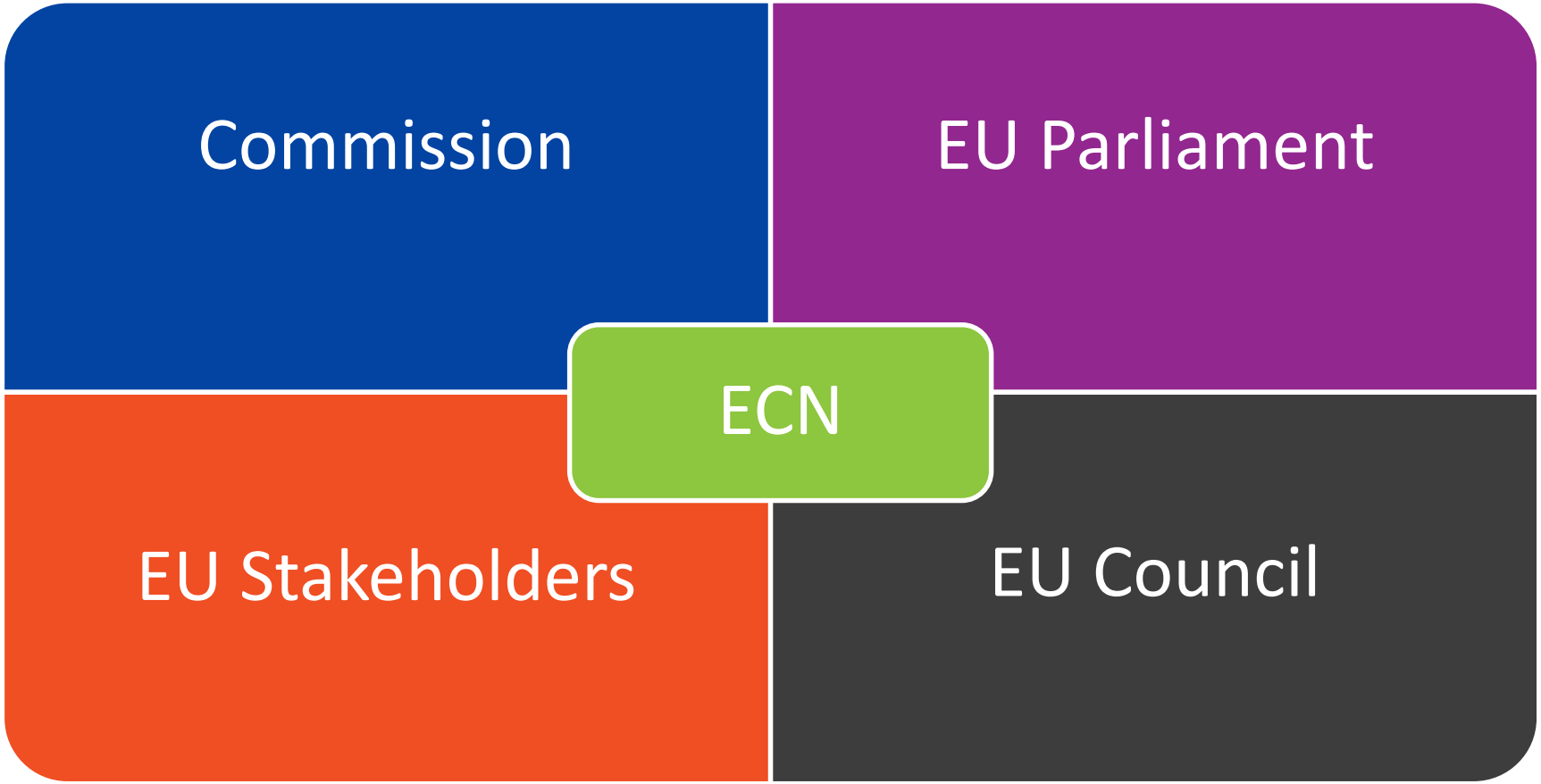


ECN's Work Structure

Area European Policy



ECN‘s EU Policy work



ECN's EU Policy Areas

The EU Circular Economy Package

Circular Economy Package

Published 2 December 2015

CE Action plan

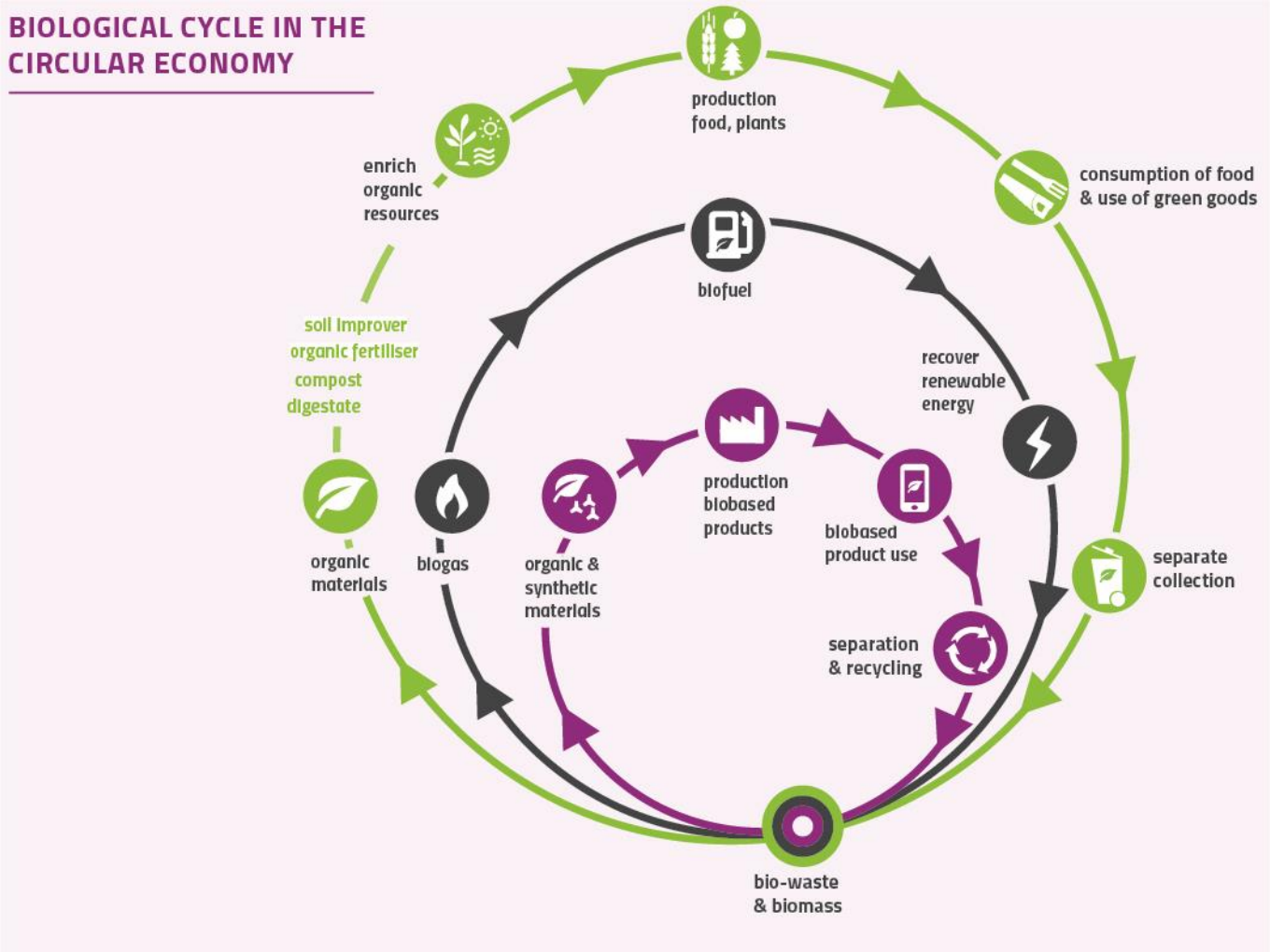
Review of waste legislations

- Obligation for separate collection of biowaste with conditions, if technically, environmentally, economically practicable (TEEP)
- Proposed general recycling target for Municipal solid waste 65 %
- Reducing landfilling of municipal waste to 10 % of the total amount of municipal waste generates by 2030

Review EU Fertilisers Regulation

Quality standards for compost and Digestate – quasi End-of-waste criteria

Compost and Digestate in the Circular Economy



Potential of Biowaste in Europe

Biowaste in Municipal Solid Waste (MSW) (EUROSTAT 2016):

- 20-60 % biowaste in MSW
- Potential of biowaste from MSW in Europe: 96 Mt pa
- Recycling of biowaste in Europe: 40 Mt pa

❖ **60 Mt pa of biowaste from MSW is wasted**

Food waste in EU 28 (2012)

- 87.6 Mt total food waste per year
- 46.5 Mt food waste from households

❖ **41.1 Mt pa of commercial and industrial biowaste**

Source: Stenmarck et. al. 2016 FUSIONS report

Biowaste management

Input for composting and anaerobic digestion plants

- **Organic fraction (green and food waste)**
- **Garden wastes**
- **Crop residues**
- **Manures**
- **Commercial & industrial (e.g. food and green waste)**

MSW

Source: ISWA 2015

Treatment of Municipal Biowaste in Europe

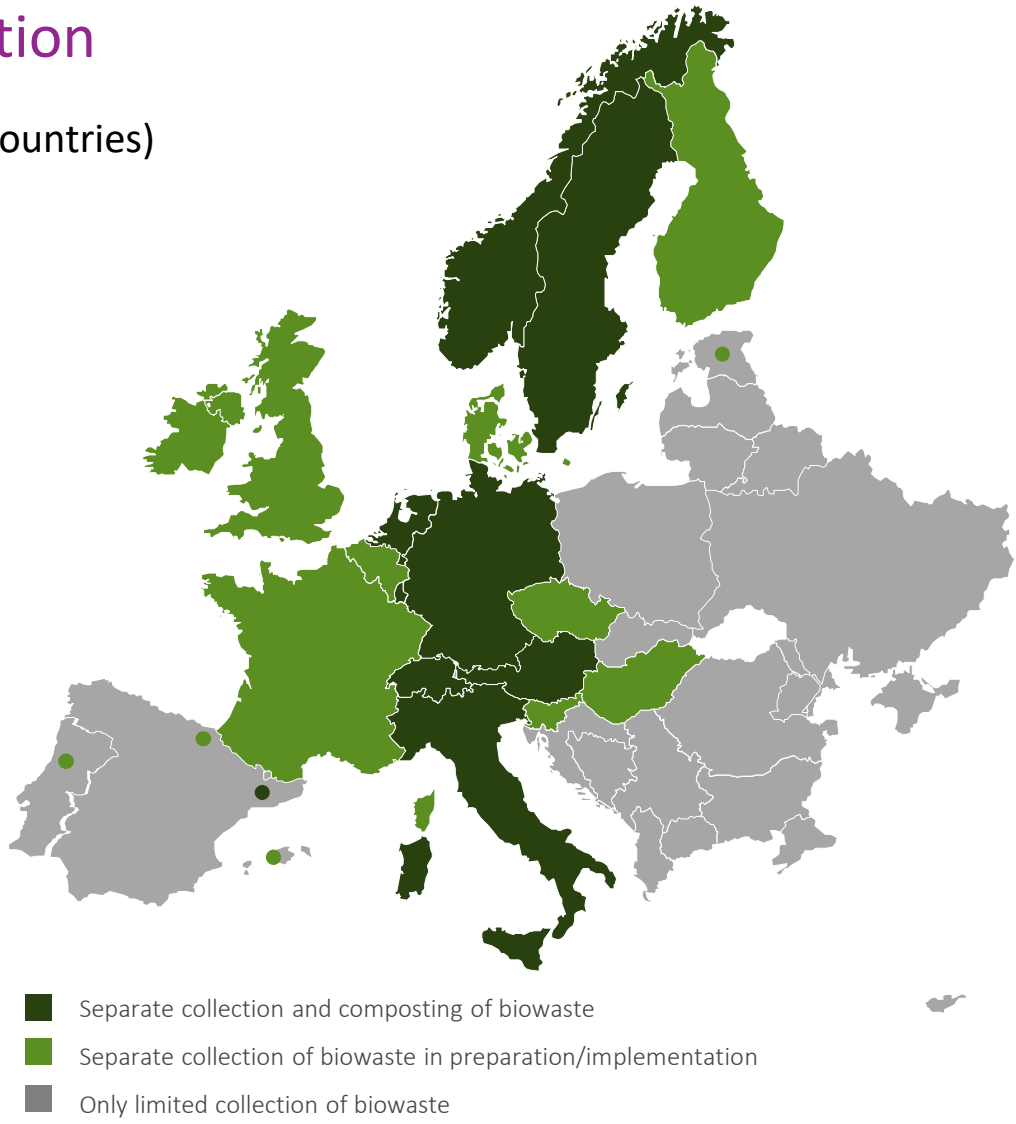
Composting and Anaerobic Digestion

ECN Survey 2017 (results from 19 European Countries)

* AT, BE, BG, CH, DE, EE, FI, FR, HU, IE, IT, LT, NL, NO, PT, SE, SI, ES, UK

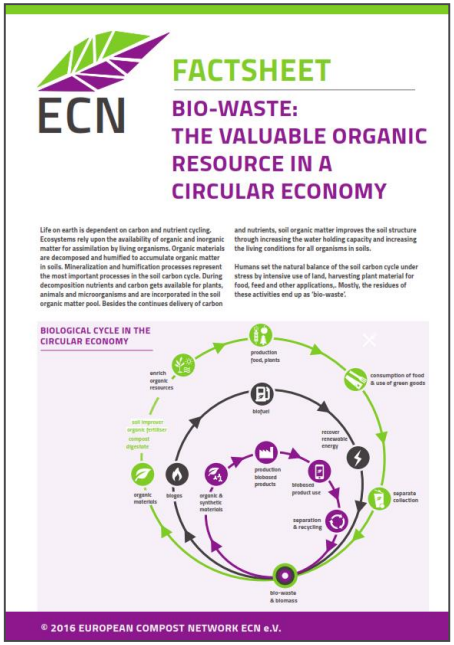
Composting	Plants	Input [mio tonnes/a]
Greenwaste	1516	10.1
Biowaste	1272	13.4

Anaerobic Digestion	Plants	Input [mio tonnes/a]
Biowaste (incl. Commercial & industiral biowaste+manure)	2.150	24.1

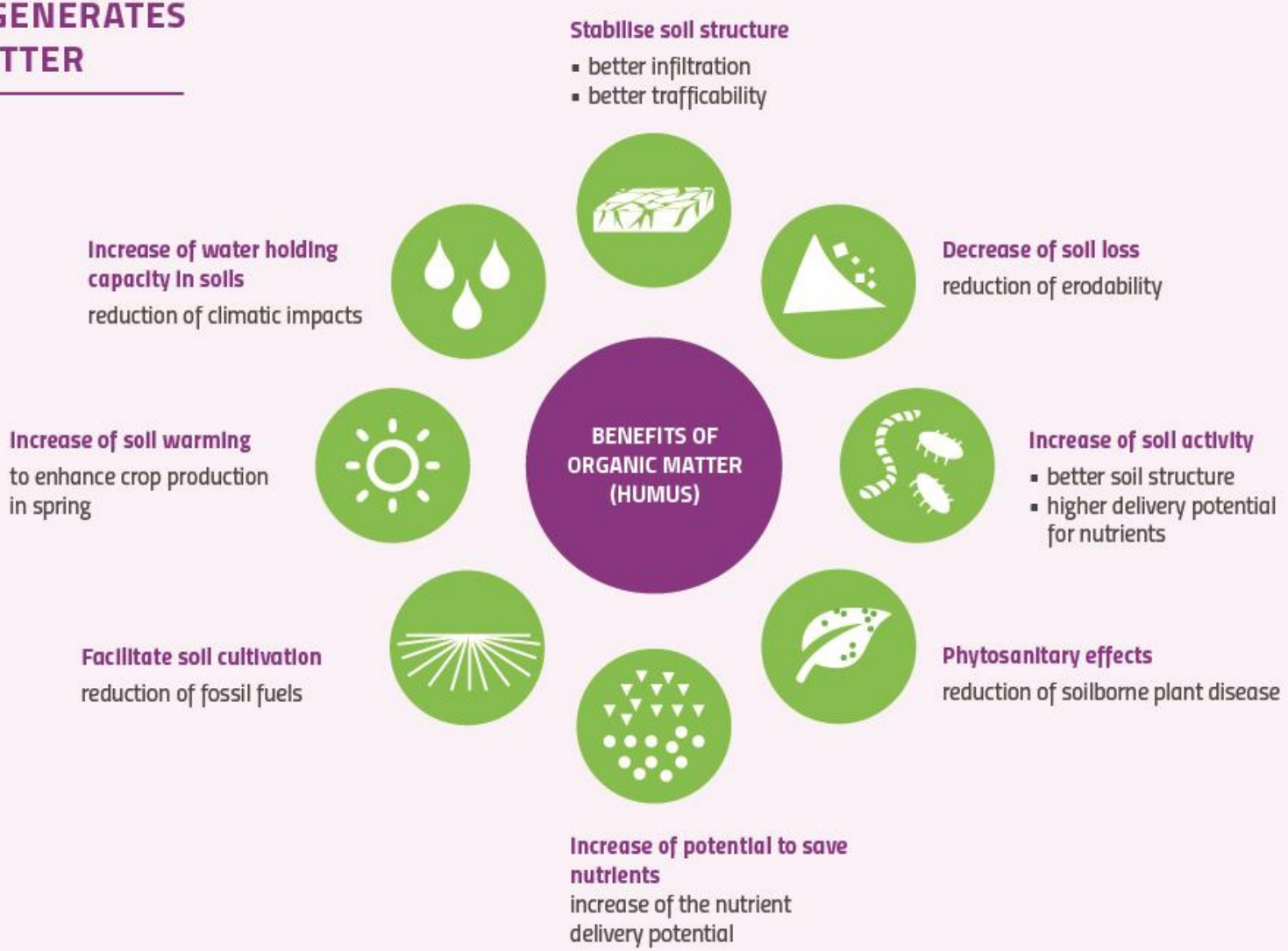


Benefits of biowaste recycling

- **Soil application:** production of organic fertilisers and soil improver
- **Application in horticulture:** replacement of peat in growing media
- **Contribution to renewable energy:** production of biogas for green power and biomethane
- **Saving GHG emissions**
- **Contribute to the Bio-economy:** production of bio-based products, e.g. biochemicals, bioplastics, fibres



BIO-WASTE GENERATES ORGANIC MATTER



Resource Potential of Compost - Fertiliser value

Nutrient and Organic Matter potential of Compost	
Total potential of bio-waste	125-130 Mio. tonnes per year
Potential of bio-waste from MSW	90 Mio. tonnes per year
Compost f.m. (40 %)	36 Mio. tonnes per year
Compost dm (d.m. 65 %)	23,4 Mio. tonnes
• Organic matter dm	8-10 Mio. tonnes
• Nitrogen (N) dm	350.000 tonnes
• Potassium (K) dm	340.000 tonnes
• Phosphorus (P) dm	81.600 tonnes

Compost markets

Range [n=12 MS]	Market range	Prices Euro/t
Agriculture	45 - 78%	0 - (28) €
Horticulture	3 - 15%	1 - (29) €
Landscaping	6 - 20%	5 - 30 €
Blends/soil mix	10 - 15%	5 - 15 €
Land reclamation	2 - 10%	1 - 2 €
Hobby gardening	12 - 20%	5 - (320) € [2)]
Export	6 - 7%	-

Source: ECN 2008 Compost production and use in the EU

EU Fertilising Product Regulation

EU Fertilising Product Regulation

Commission proposal COM(2016)157 final, published 17/03/2016

- Including organic fertilisers, soil improvers, growing media, bio-stimulants
- Quasi end-of-waste criteria for compost and digestate from biowaste
  - defined input materials (separate collected bio-waste, no MBT material, no sewage sludge)

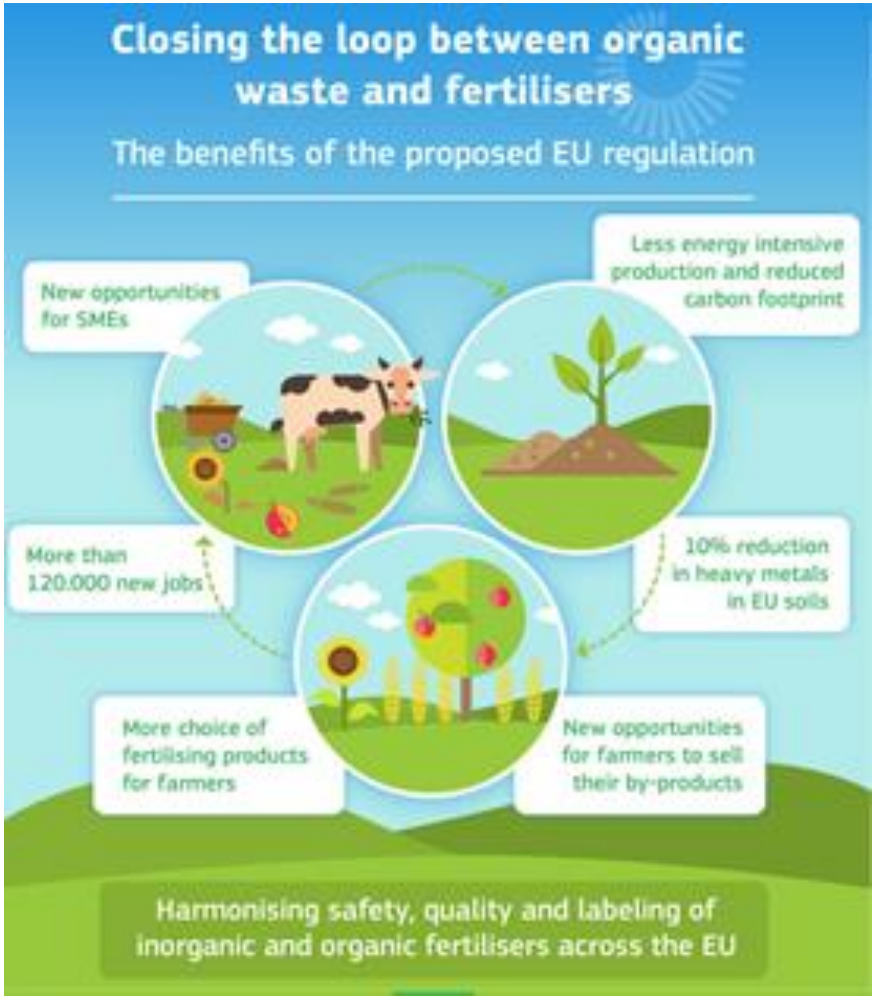
Annexes

1. **Product Function Categories ‚PFC' of CE marked fertilising products**
2. **Component Material Categories ‚CMC'**
3. Labelling requirements
4. **Conformity assessment procedures**
5. EU Declaration of conformity

EU Fertilising Product Regulation

Vice-President **Jyrki Katainen**:

"Very few of the abundant bio-waste resources are transformed into valuable fertilising products. Our farmers are using fertilisers manufactured from imported resources or from energy-intensive processes although our industry could valorise these bio-wastes in recycled nutrients. This Regulation will help us turn problems into opportunities for farmers and businesses."



ECN

EU Fertilising Product Regulation – Ojectives

General support on the objectives of the EU Fertilising Product Regulation

- Boosting organic matter (biowaste) recycling from biowaste within CEP
- Integration of organic fertilising products into the scope of the NFR
- Introducing harmonised EU rules for products diverting from organic waste materials
- Creating access to CE marking and free trade for organic fertilising products across EU
- Maintaining the existing “Optional Harmonisation” scheme, free choice to opt for compliance with national rules for fertilising products restricted to national markets or CE marked fertilisers with unrestricetd access to EU market

ECN

EU Fertilising Product Regulation – New Structure

Exhaustive list of Component Materials Categories

CMC (11)

- Quality
- Safety
- …

CMC 3 Compost
CMC 5 Digestates other than from energy crops

Exhaustive list of Product Function Categories

PFC (7)

- Quality
- Safety
- Declaration
- …

PFC 1 A. Organic fertiliser
PFC 3 A. Organic Soil Improver
PFC 4 Growing Media
PFC 7 Fertilising Products Blends

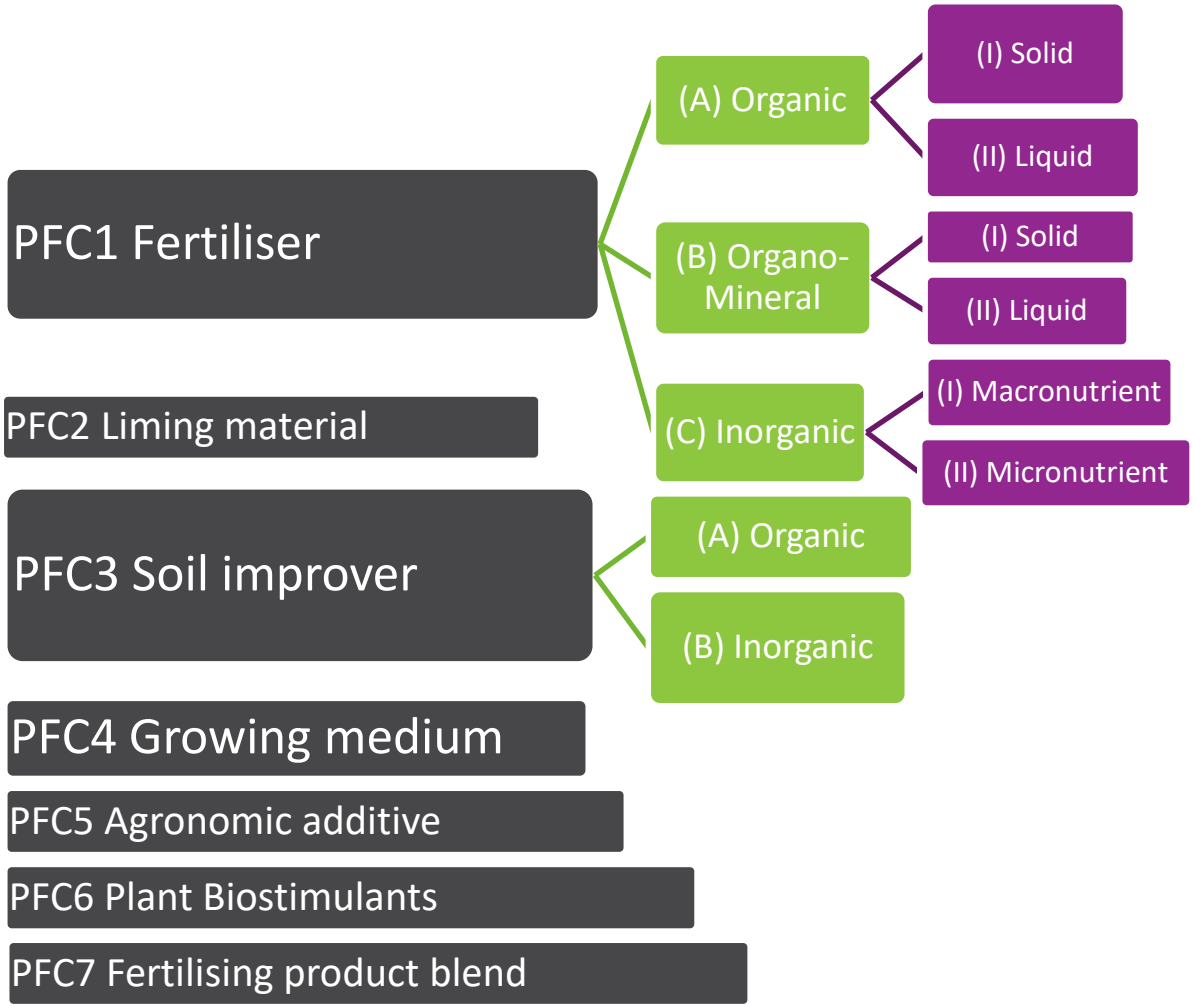
Conformity assessment procedure related to 'CMC/PFC' combination

- Modul A - D1
- Declaration of conformity

Modul D.1
Quality Assurance of Process and Products

ECN

EU Fertiliser Regulation - Product Function Categories (PFC)



Product Function Categories (PFC) - Requirements

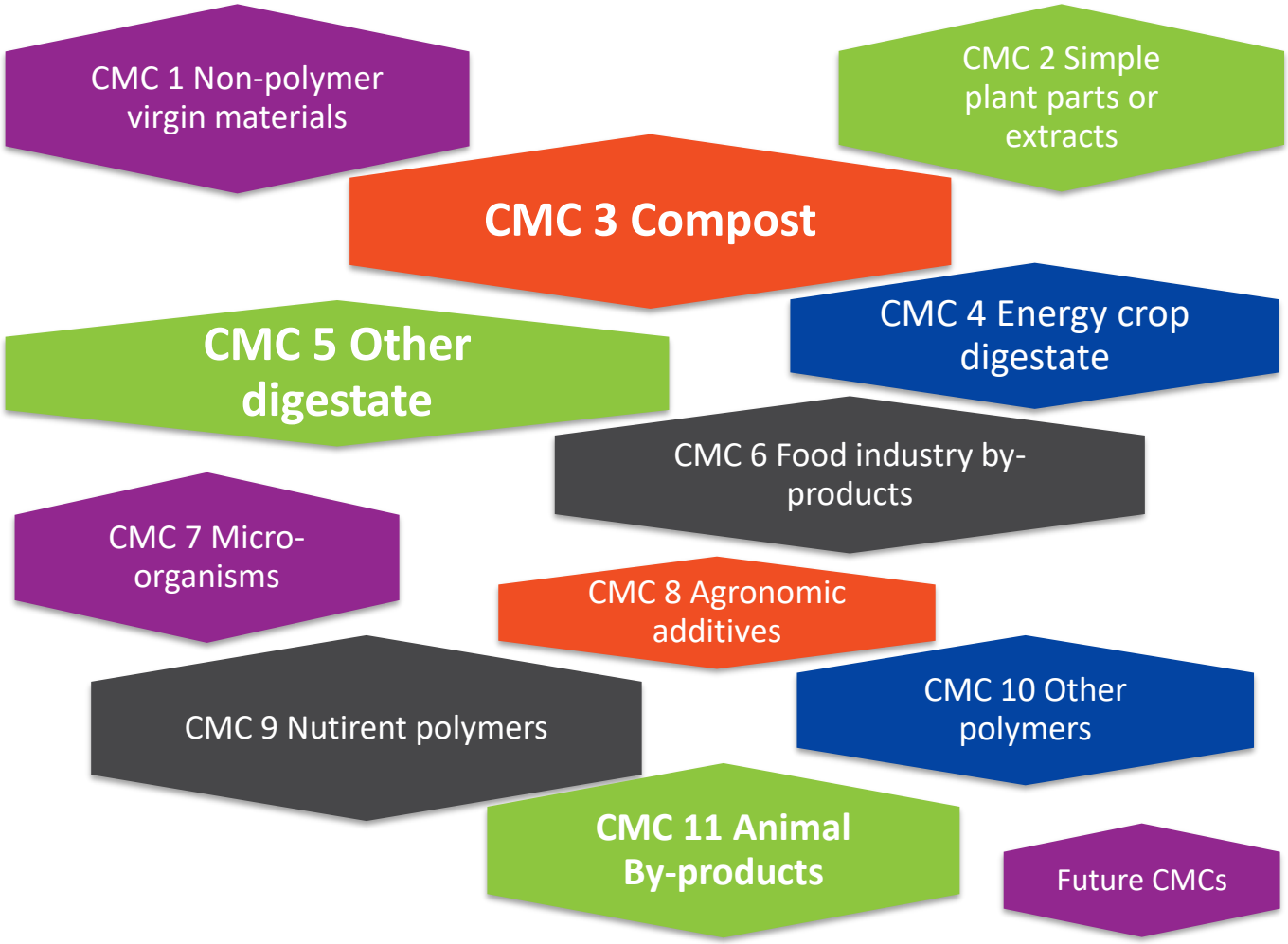
Criteria	PFC 1 (A)(I)	PFC 1 (A) (II)	PFC 3 (A)
	Organic Fertiliser solid	Organic Fertiliser liquid	Organic Soil improver
Dry matter	≥ 40 %		≥ 40%
Corg	≥ 15 %	≥ 5 %	≥ 7,5 %
Nitrogen (N)*	≥ 2,5 %	≥ 2 %	-
Phosphorus* (P_2O_5)	≥ 2 %	≥ 1%	-
Potassium* (K_2O)	≥ 2%	≥ 2%	-

All values based on fresh matter
* As a minimum one of the three nutrient contents have to been reached

Product Function Categories (PFC) - Requirements

Criteria	PFC 1 (A)(I)	PFC 1 (B)	PFC 3 (A)	PFC 4
	Organic Fertiliser solid	Inorganic Fertiliser	Organic Soil improver	Growing Media
Cd (mg/kg dm)	1,5	3	3	3
Cr IV (mg/kg dm)	2	2	2	2
Hg (mg/kg dm)	1	2	1	1
Ni (mg/kg dm)	50	120	50	100
Pb (mg/kg dm)	120	150	120	150
$C_2H_5N_3O_2$ (g/kg dm)	12	12	-	-
Salmonella spp.	absent	-	absent	absent
Escherichia coli / Enterococcaceae (CFU/g)	≤ 1000	-	≤ 1000	≤ 1000

Component Material Categories (CMC)



Component Material Categories – Requirements

Criteria	CMC 3	CMC 5
	Compost	Other digestate than energy crop digestate
Input materials	Bio-waste, source separated, ABP cat 2 & 3, exlcuded sewage sludge and mixed municipal waste	
Process criteria	65 °C ≥ 5 days 60 °C ≥ 7 days 55 °C ≥ 14 days	55°C ≥ 4 h, hydraulic retention ≥ 20 days, 70 °C / 1h etc.+ post-composting
Stability	≤ 25 mmol O_2/kg organic material/h ≥ RG III	≤ 50 mmol 0_2/kg organic material/h ≤ 0,45 l biogas/g vs
Impurities (> 2mm)	≤ 5 g/kg*	≤ 5 g/kg*
PAH_{16}	≤ 6 mg/kg	≤ 6 mg/kg

All values based on dry matter
* 2,5 g/kg dm 5 years after the date of application of this Regulation

EU Organic Farming Regulation

Depending on the used input materials (CMC) for the production of a fertilising product (PFC) different conformity assessments have to be applied:

- Module A: Internal production control (CMC 1, CMC 4,CMC 6, CMC 7, CMC 8, CMC 9)
- Module B: EU-Type Examination (Notification of a fertilisers)
- Module C: Conformity to type based on internal production control
  - Modul B +C: CMC 2, CM6, CMC 10, CMC 11, PFC 5 (A)(I),(II), PFC 6
- **Module D1: Quality assurance of the production process (CM3, CM5)**

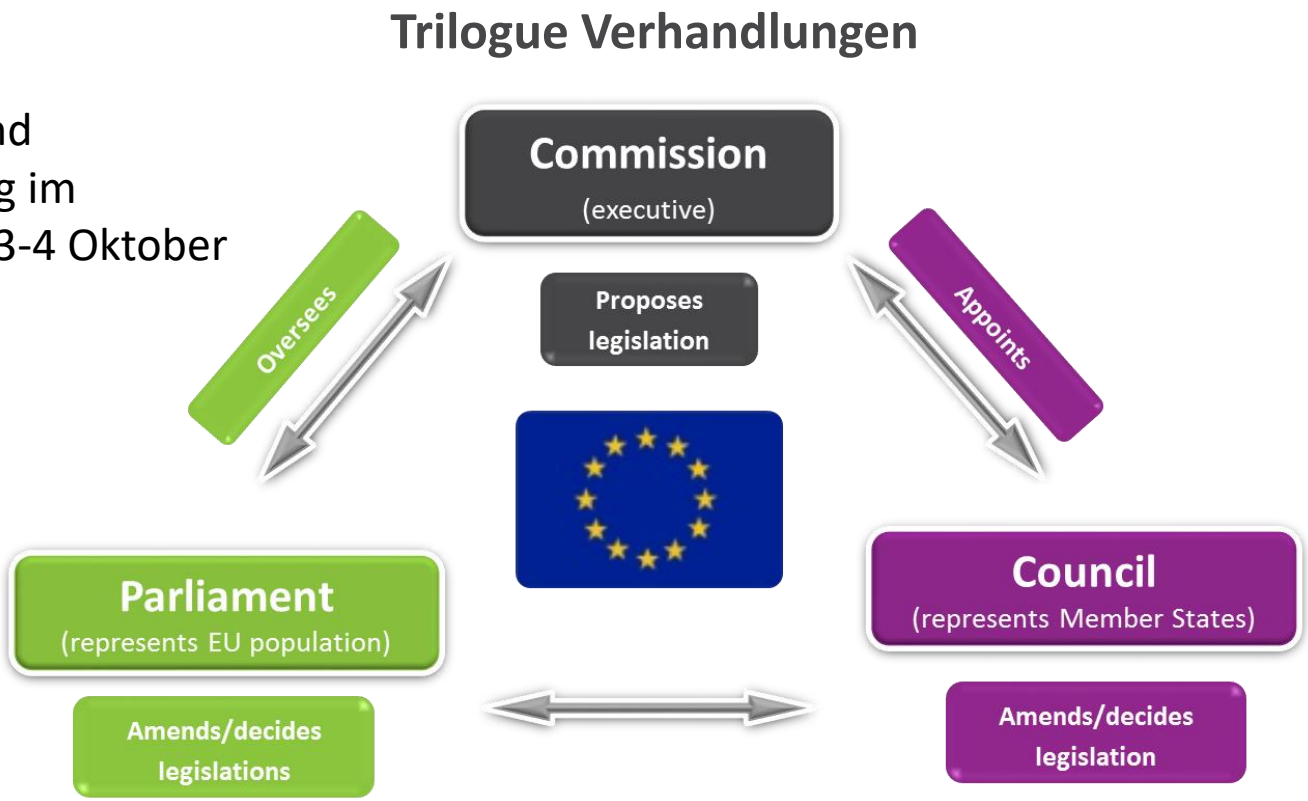
EU Fertiliser Regulation – Conformity Assessment

Modul D1: Quality Assurance of the Production Process related to (CM3, CM5)

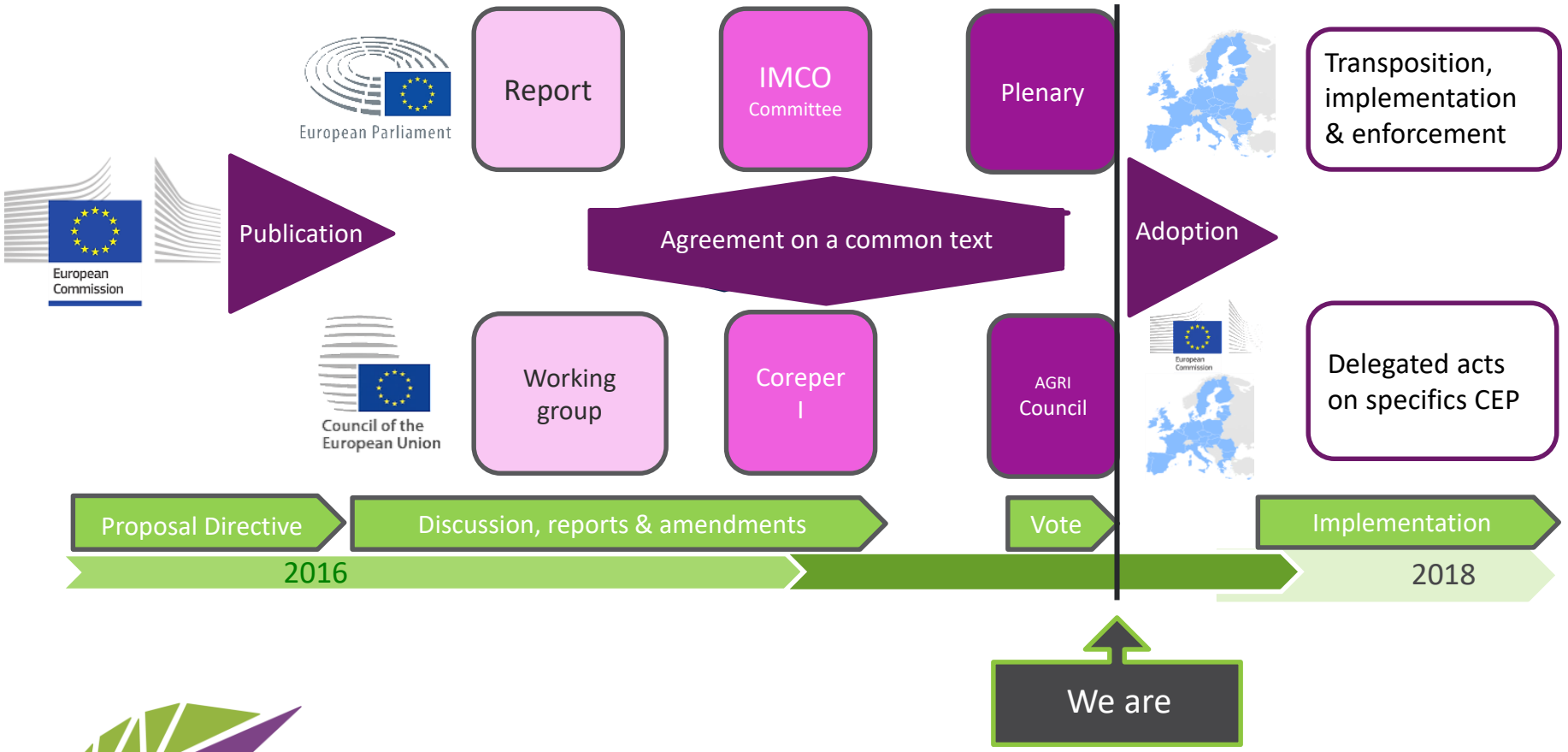
- Quality Assurance System
  - Input materials
  - Control of the production process
  - Product controls on a regular basis
  - Internal control
  - Documentation
- External control by accredited and notified body

EU Fertiliser Proposal - Status of discussion

Beratung und Abstimmung im Parlament: 3-4 Oktober



EU Fertiliser Regulation - Status of discussion



EU Organic Farming Regulation

EU Organic Farming Regulation

Published as (EC) No 834/2007

- Legal framework for organic farming products
- It contains the basic objectives and general principles for organic farming, and
- Illustrates the rules on production, labelling, controls and trade with non-EU countries.

Implementation Regulation

Published as (EC) No 889/2008 of 5 September 2008

- Laying down detailed rules for the implementation of Council Regulation (EC) No 834/2007 on organic production and labelling of organic products with regard to organic production, labelling and control

Revision of the Organic Farming Regulation

- Commission proposal 2014 still under debate
- Latest EP Briefing from 28 June 2017

EU Organic Farming Regulation

Scope, it covers

- Agricultural products (including aquaculture products), either processed or unprocessed and intended for human consumption;
- Animal feed, and vegetative propagating material (e.g. roots and grafts) and seed used for crops;
- Yeasts used as food or feed.

EU Logo on Organic Farming

EU Organic Farming Regulation

Overall objectives

The regulation set out the following objectives:

- sustainable cultivation systems
- a variety of high-quality products.
- greater emphasis on environmental protection
- more attention to biodiversity
- higher standards of animal protection
- consumer confidence
- protecting consumer interests.

ECN

EU Organic Farming Regulation

In addition to the overall principles, organic farming shall be based on the following **specific principles**:

- the maintenance and enhancement of **soil life and natural soil fertility,** soil stability and soil biodiversity preventing and combating soil compaction and soil erosion, and the nourishing of plants primarily through the soil ecosystem;
- the **minimisation of the use of non-renewable resources and off-farm inputs;**
- the **recycling of wastes and by-products** of plant and animal origin as input in plant and livestock production;
- Etc.

EU Organic Farming Regulation

Article 12 Plant production rules

In addition to the general farm production rules, the following rules shall apply to organic plant production:

- Organic plant production shall use tillage and cultivation practices that maintain or **increase soil organic matter, enhance soil stability and soil biodiversity, and prevent soil compaction and soil erosion;**
- The **fertility and biological activity** of the soil shall be maintained and increased by multiannual crop rotation including legumes and other green manure crops, and by the application of livestock manure **or organic material, both preferably composted, from organic production;**

ECN

EU Organic Farming Regulation

In addition

- **Fertilisers and soil conditioners** may only be used if they have been **authorised** for use in organic production under Article 16;
- **Mineral nitrogen fertilisers shall not be used;**
- All plant production techniques used shall prevent or **minimise any contribution to the contamination of the environment;**

➢ The **list of external fertilisers and soil improvers** including specific requierements are laid down in the annexes to the implementing regulation (Commission Regulation (EC) No. 889/2008).

EU Organic Farming Regulation

ANNEX I: Fertilisers and soil conditioners (examples)

- **Farmyard manure**
  - Product comprising a mixture of animal excrements and vegetable matter (animal bedding), Factory farming origin forbidden
- **Dried farmyard manure and dehydrated poultry manure**
  - Factory farming origin forbidden
- **Composted animal excrements, including poultry manure and composted farmyard manure included**
  - Factory farming origin forbidden
- **Liquid animal excrements**
  - Use after controlled fermentation and/or appropriate dilution
  - Factory farming origin forbidden

EU Organic Farming Regulation

Composted or fermented mixture of vegetable matter

Product obtained from mixtures of vegetable matter, which have been submitted to composting or to anaerobic fermentation for biogas production

- **Green waste compost**
- **Energy crop digestate**
- **No specific requirements are needed**

EU Organic Farming Regulation

Composted or fermented household waste

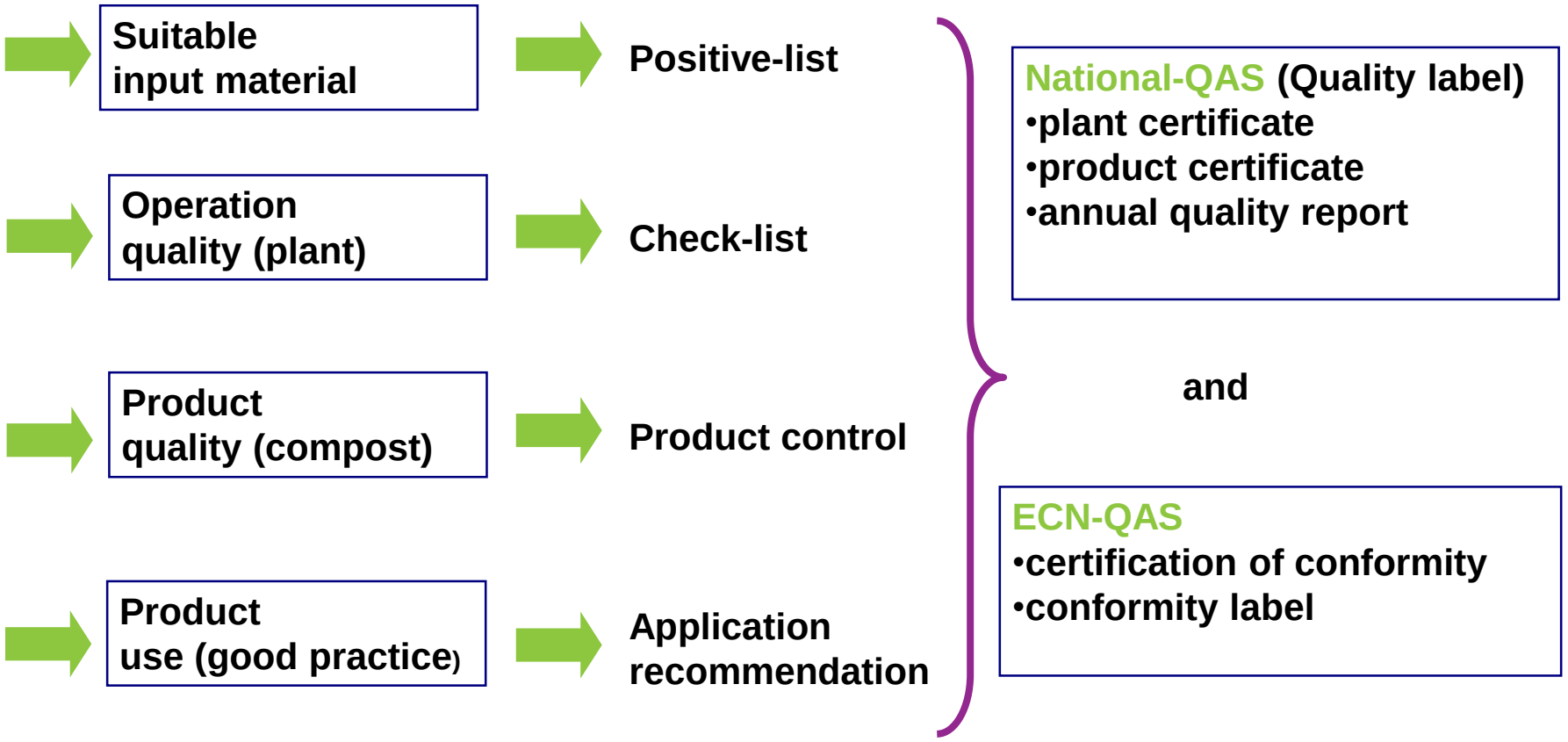
Product obtained from **source separated household waste**, which has been submitted to composting or to anaerobic fermentation for biogas production

- Only vegetable and animal household waste
- Only when produced in a closed and monitored collection system, accepted by the Member State
- Maximum concentrations in mg/kg of dry matter: cadmium: 0,7; copper: 70; nickel: 25; lead: 45; zinc: 200; mercury: 0,4; chromium (total): 70; chromium (VI): 0

➢ **Biowaste compost and digestate**

Quality criteria for compost and digestate

Quality criteria compost and digestate



Quality criteria compost and digestate

Process recommendations for composting

- 55 °C for 14 days in open windrow systems or
- 65 °C / 60 °C for three days in open windrow / in-vessel systems

Process recommendations for digestion

- Proof of digestion process based on process model with critical control points (CCP), hydrolic retention time, hygienisation record)

Overview on environmental criteria

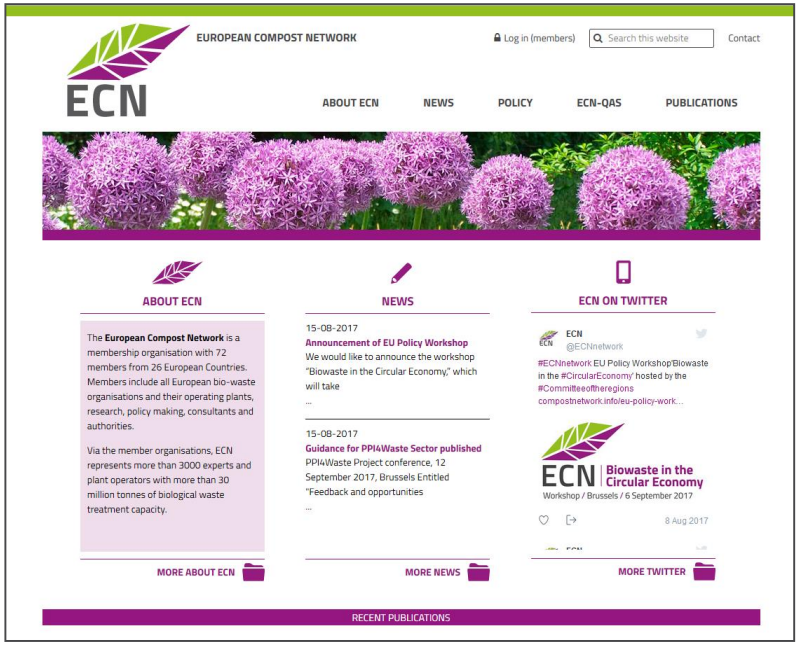
Criteria	ECN-QAS	PFC 1 (A)(I)	PFC 3 (A)	Organic farming Reg.
	Compost and Digestate solid	Organic Fertiliser solid	Organic Soil improver	Compost /digestate
Cd (mg/kg dm)	1,3	1,5	3	0,7
Cr IV / Cr (mg/kg dm)	- / Cr 60	2 / -	2 / -	0 / 70
Hg (mg/kg dm)	0,45	1	1	0,4
Ni (mg/kg dm)	40	50	50	25
Pb (mg/kg dm)	130	120	120	45
$C_2H_5N_3O_2$ (g/kg dm)	-	12	-	-
Salmonella spp.	absent	absent	absent	absent
Escherichia coli / Enterococcaceae (CFU/g)		≤ 1000	≤ 1000	≤ 1000

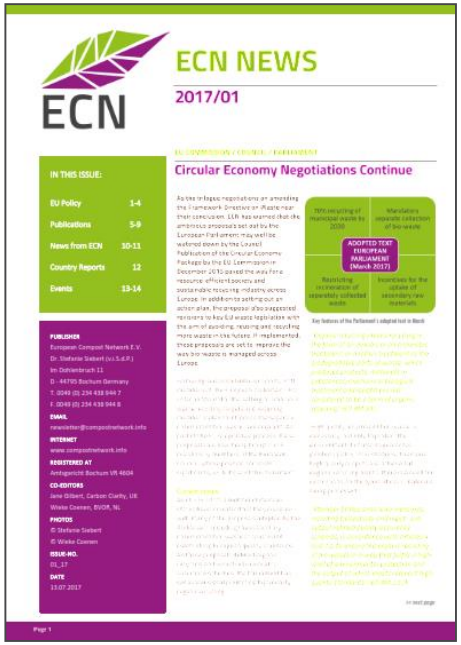
Overview on environmental criteria

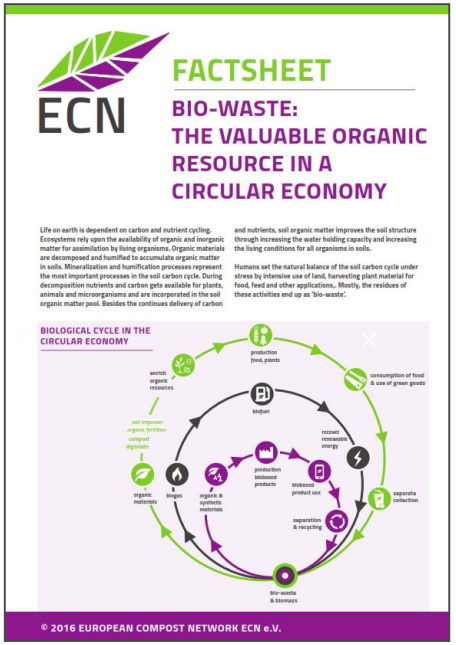
Criteria	ECN-QAS	Fertilisers Reg.	Fertiliser Reg.	Organic farming Reg.
	Compost and Digestate solid	Digestate (CMC 5)	Compost (CMC3)	Compost /digestate
Cu (mg/kg dm)	300	-	-	70
Zn (mg/kg dm)	600	-	-	200
PAH_{16} (mg/kg dm)	-	6	6	-
Weed seeds (seeds /L)	≤ 2			
Impurities (% dm)	≤ 0,5			
Stability				
_ Oxygen Update rate (mmol O_2/ OM *h	-	50	25	-
- Rotting degree	-	-	III	-
- Residual Gas potential (liter biogas/g volatile solids)	-	0,45	-	-

Further information

Further information







www.compostnetwork.info

ECN