Nordic Biogas Conference

Oslo, April 9th - 10th, 2019

OSLO

EUROPEAN GREEN CAPITAL

Biofertilizer / digestate:

Securing the whole value chain.

How to turn digestate from a cost to an asset?

ECN

European Compost Network ECN e.V.
info@compostnetwork.info

Outline

- **Introduction by Henrik Lystad** **13:30-13:35**
  Avfall Norge – Chair of ECN
- **Overview of digestate production, fertiliser regulation and the role of Quality Assurance in Europe** **13:35-13:45**
  Stefanie Siebert, European Compost Network (ECN)
- **Developments in upgrading digestate for alternative uses. Case studies from Germany.** **13:45-14:00**
  Florian Strippel, Fachverband Biogas Germany.
- **State of the art - Digestate used as valuable organic fertiliser in Sweden**
  Caroline Steinwig, Avfall Sverige Sweden **14:00–14:15**
- **From biowaste to fertilisers and biomethane: an Italian success story of integration** **14:15-14:30**
  Alberto Confalionieri, CIC Italy.
- **Discussion** **14:30-14:45**

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Overview of digestate production, fertiliser regulation and the role of Quality Assurance in Europe

Stefanie Siebert, European Compost Network e.V.

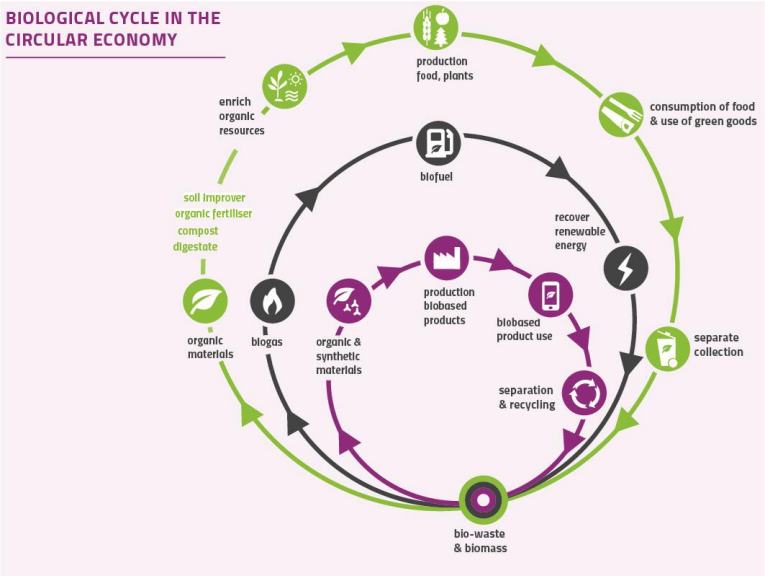
Outline

- European Compost Network
- State of the art – Composting and Anaerobic Digestion in Europe
- EU Circular Economy
  - The new Fertilising Product Regulation
- The Quality Assurance of Digestate in Europe

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 of organic resources: composting, anaerobic digestion…

61 members from 27 European countries

45 M tpa treatment capacities

4.500 treatment plants (composting & AD)

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ECN's objectives for the separate collection, biological treatment, production & use of quality compost and digestate :

1. **FAVOURABLE LEGAL FRAMEWORK – EUROPEAN POLICY**
   Achieve an EU legal framework
2. **MARKET DEVELOPMENT**
   Achieve favorable market conditions across Europe
3. **IMPLEMENTING QUALITY ASSURANCE SCHEMES**
   Achieve Europe wide implementation quality assurance schemes with ECN-QAS as a benchmark

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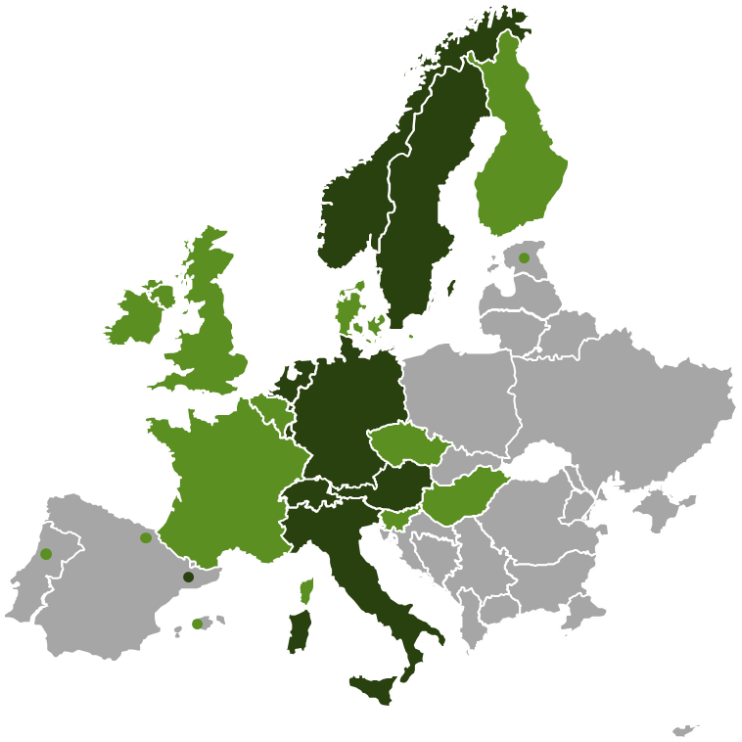
State of the art of biological treatment in Europe

Biological treatment of municipal biowaste	Plants	Input [Mio t/a]
Composting	3.849	30.55
AD and combined AD & composting	705	14.38
Total	4.554	44.93

Source: ECN/ISWA Survey 2017 (results from 19 European Countries*)



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

Treated bio-waste

- ca. 60 % green waste
- ca. 40 % biowaste (food waste mixed with green waste)

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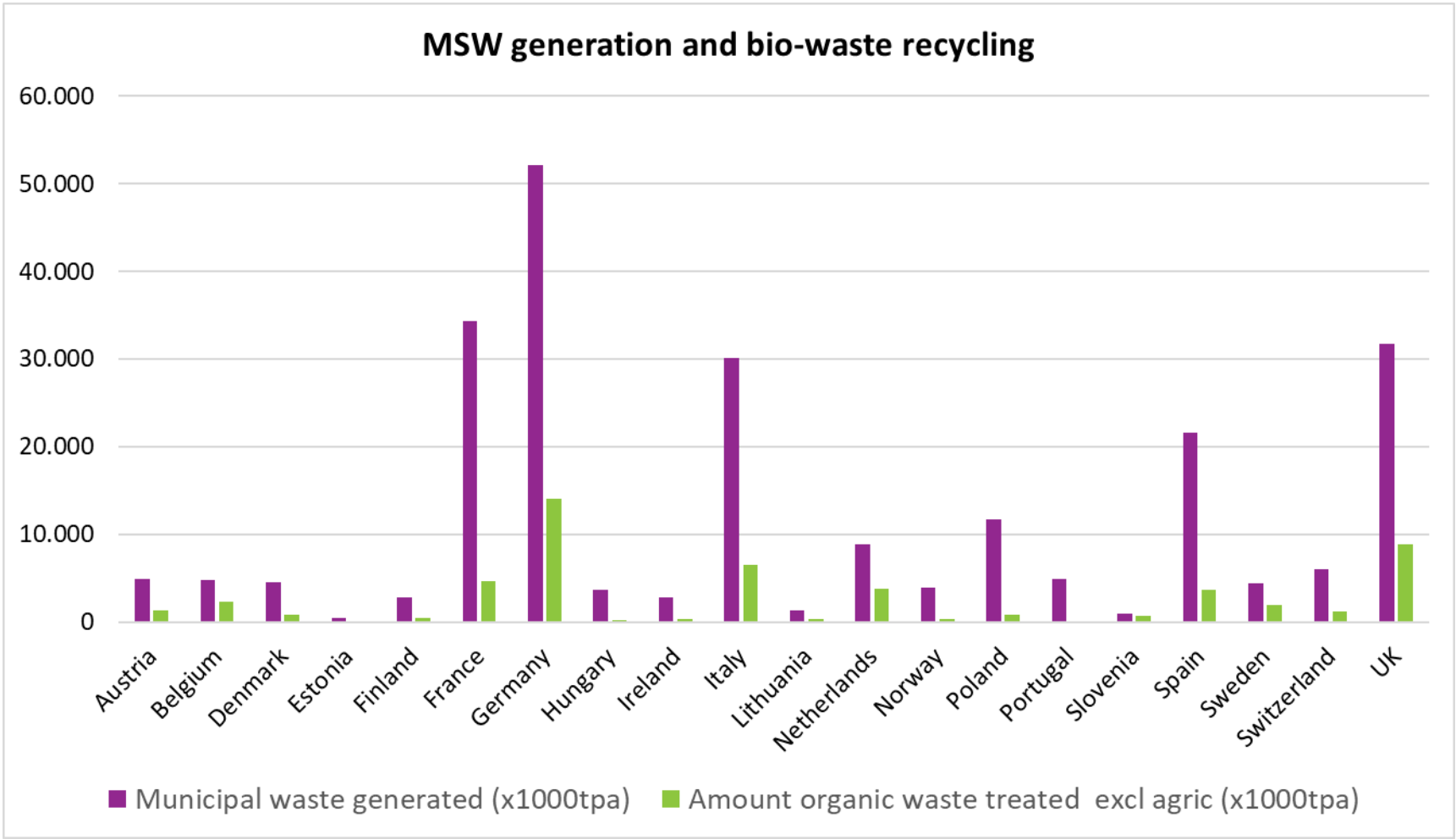
State of the art of biological treatment in Europe



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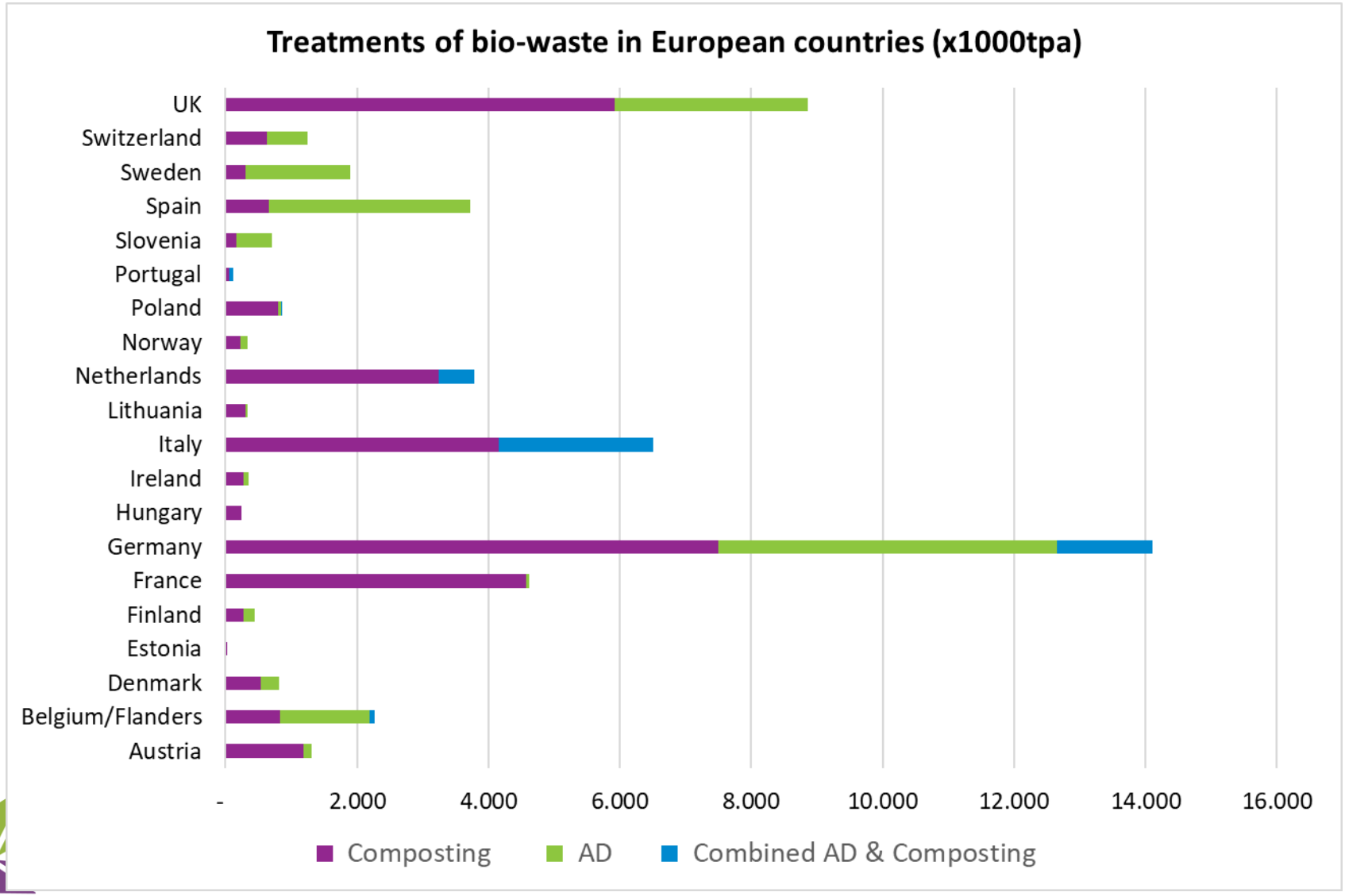
State of the art of biological treatment in Europe



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Future potential for biologoical treatment

Potential und Treatment

- Total biowaste potential in Europa: **118-138 Mt pa**
- 20-60 % Biowaste in Municipal Solid Waste (MSW)
- Biowaste potential of MSW in Europa: **96 Mt pa**
- Biowaste management in Europa: **40 Mt pa**

❖ **60 Mt pa Biowaste are wasted every year!!**

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

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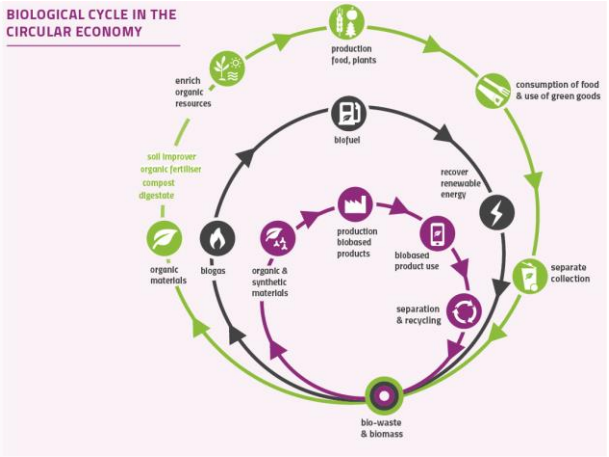
The EU Circular Economy



Objectives

- Reduction of waste production in Europe
- Promoting recycling
- Saving primary resources

➢ **Revision of the Waste Framework Directive and Landfill Directive**

- **Status: Adopted and implementation in Member States**

- Establishing of markets for secondary products

➢ **Revision of the EU Fertilising Regulation –provisional agreement by the European Parliament on 27 March 2019**

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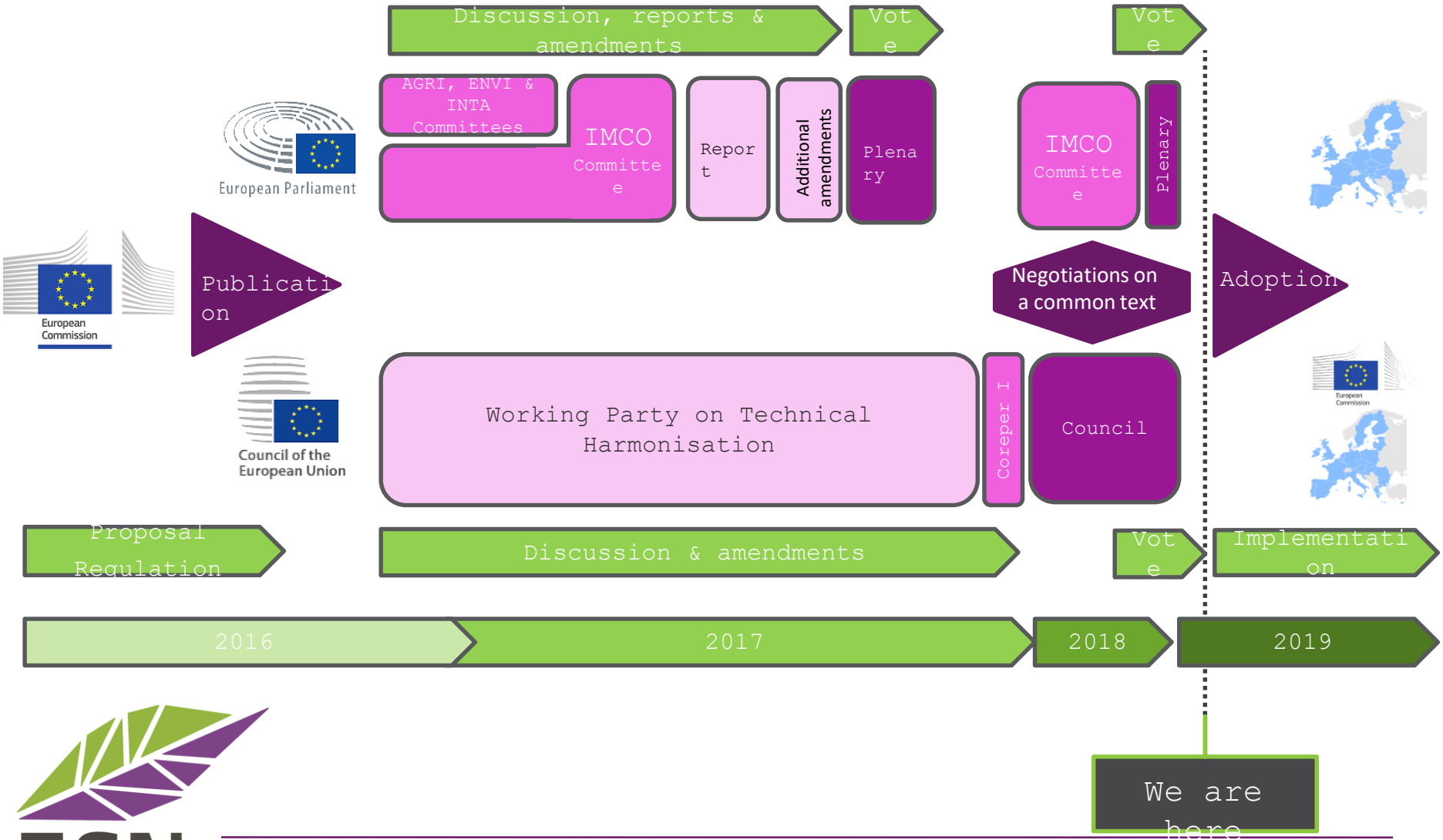
Status of the EU Fertilising Product Proposal



EU Fertilising Product Proposal

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)

Objectives

- 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

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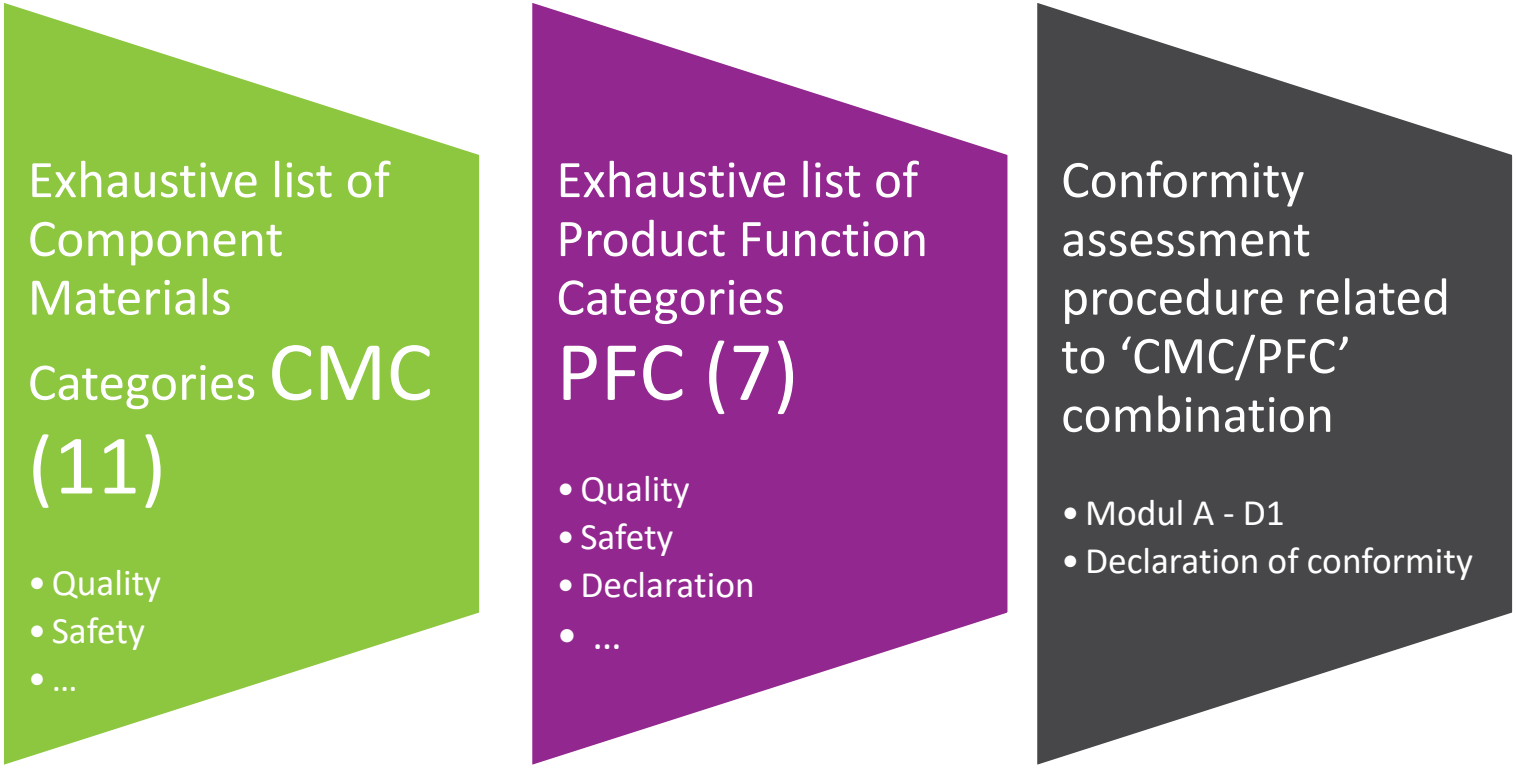
Structure of the EU Fertilising Product Proposal



CMC 3 Compost
CMC 5 Digestates other than from energy crops

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

Modul D.1
Quality Assurance of Process and Products

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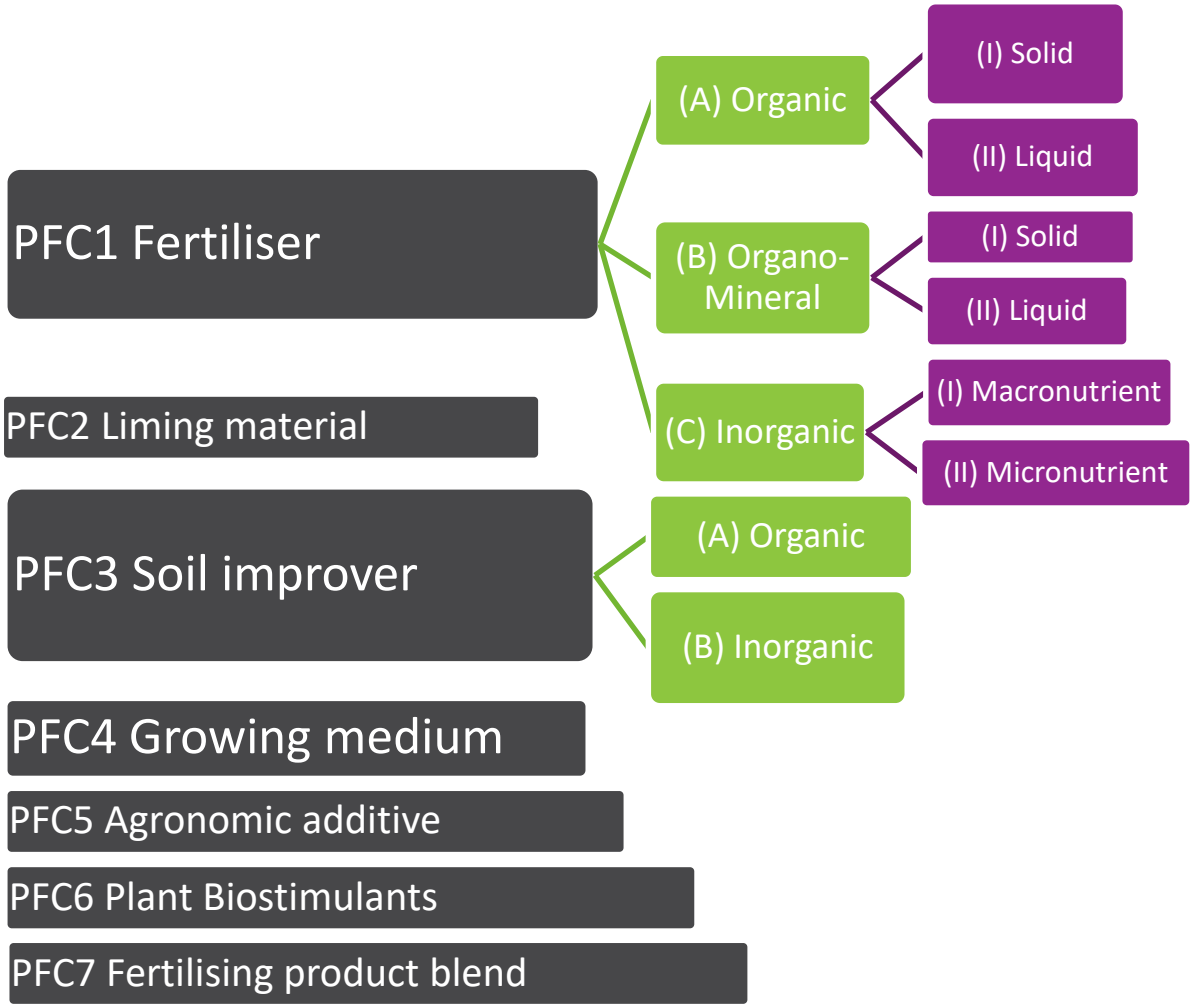
New structure - Product Function Categories (PFC)



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PFC1(A)(I)/(II) – Requirements Organic fertiliser

	PFC 1 (A)(I)	PFC 1 (A)(II)
Criteria	Solid	Liquid
Corg	≥ 15 %	≥ 5 %
Nitrogen (N)	≥ 2,5 %*	≥ 2 %
Phosphorus ($P_2 0_5$)	≥ 2 %*	≥ 1%
Potassium* (K_2O)	≥ 2 % *	≥ 2 %
SUM (NPK)	(1/1/1) ≥ 4	(1/1/1) ≥ 3 %
All values based on fresh matter * As a minimum one of the three nutrient contents have to been reached		

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PFC3(A) – Requirements Organic soil improver

	EP
Dry matter	≥ 20 %
Corg	≥ 7,5 %
Composition	An organic soil improver shall consist 95% of material of solely biological origin **including peat, leonardite, lignite and humic substances obtained from them** but excluding other materials which are fossilized or embedded in geological formations.
All values based on fresh matter	

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Criteria	PFC 1 (A)(I)/(II)	PFC 3 (A)
	Organic fertiliser	Organic soil improver
Cd (mg/kg dm)	1,5	2
Cr IV / Cr (mg/kg dm)	2 / -	2 / -
Hg (mg/kg dm)	1	1
Ni (mg/kg dm)	50	50
Pb (mg/kg dm)	120	120
Cu (mg/kg dm)	300	300
Zn (mg/kg dm)	800	800
As /mg/kg dm)	40	40
$C_2H_5N_3O_2$ (g/kg dm)	absent	-
Salmonella spp.	absent	absent
E. Coli / Enterococcaceae (CFU/g)	≤ 1000	≤ 1000

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Overview on environmental criteria

Criteria	Fertilisers Reg. Digestate	Fertiliser Reg.
	Digestate (CMC 5)	Compost (CMC 3)
PAH_{16} (mg/kg dm)	6	6
Weed seeds (seeds /L)	-	-
Impurities (% dm)	≤ 0,5[x1]	≤ 0,5[x1]
Stability		
Oxygen Update rate [OUR] (mmol O_2/ OM *h)	25	25
-OUR/Rotting degree /- Residual Gas potential (liter biogas/g volatile solids) / organic acides (mg/l)	-/≤0,25/-	III/-/-

[X1] no more than 3 g/kg dry matter of macroscopic impurities above 2 mm in any of the following forms: glass, metal or plastics; and

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Process Requirements for digestate

	Fertiliser Regulation
Input material	Bio-waste, source separated, ABP cat 2 & 3, excluding sewage sludge and mixed municipal waste Plus a liquid or non-liquid microbial or non-microbial extract made out of compost; and Unprocessed and mechanically processed residues from food production industries, except ABPR materials
Process criteria for digestate	a) Thermophilic at 55 °C/24 h/hydraulic retention time of 20 days b) Thermophilic at 55 °C incl. pasteurisation step 70 °C-1h c) Thermophilic at 55 °C followed by composting d) Mesophilic at 37-40 °C incl. pasteurisation step 70 °C-1 h e) Mesophilic at 37-40 °C followed by composting
Process criteria for compost	70 °C ≥ 3 days 65 °C ≥ 5 days 60 °C ≥ 7 days 55 °C ≥ 14 days

Fertiliser Regulation - Quality assurance

Quality Assurance is a pre-condition for placing compost- or digestate-based fertilising products on the European Market

- **External control of the quality assurance system by an <u>accredited</u> notified body**

ECN's Concerns on the EU Fertilising Product Proposal

- The lack of recognition that **limit values for minimum nutrient and organic carbon content** should be expressed on **dry matter basis**

➢ **It will be difficult for digestates (liquid or solid) to fulfill the nutrient or carbon minimum content requirements for organic fertilisers or soil improvers.**

- The pathogen control with **limit values for '*Escherichia coli* / *Enterococcaceae*' as product criteria** for organic fertilisers, organic soil improvers and growing media

➢ **Organic materials will be excluded to be placed as fertilising products on the European market** as these pathogens will regrow

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ECN's Concerns on the EU Fertilising Product Proposal

- The proposed **stability criteria for digestate** will be difficult to reach for solid and especially for liquid digestate.
- The requirement that the quality assurance organisations have to be **accredited by the national bodies:**

External control of fertilising products based on compost (CMC3) and digestate (CMC5) by **an accredited national body will be very costly!**

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Quality Assurance schemes for Digestate in Europe

ECN-QAS European Quality Assurance Scheme for compost and Digestate

Objective: Harmonisation and promotion of recycling of organic waste materials «from waste to product»

Conformity assessed quality assurance organisations in ECN-QAS

BGK/GGG Germany

Vlaco Belgium

Meer halen uit de biologische kringloop

Further quality assurance schemes or standards for digestate

SE: QAS for Digestate of AvFall Sverige

UK: BSI PAS 110: Producing Quality Anaerobic Digestate

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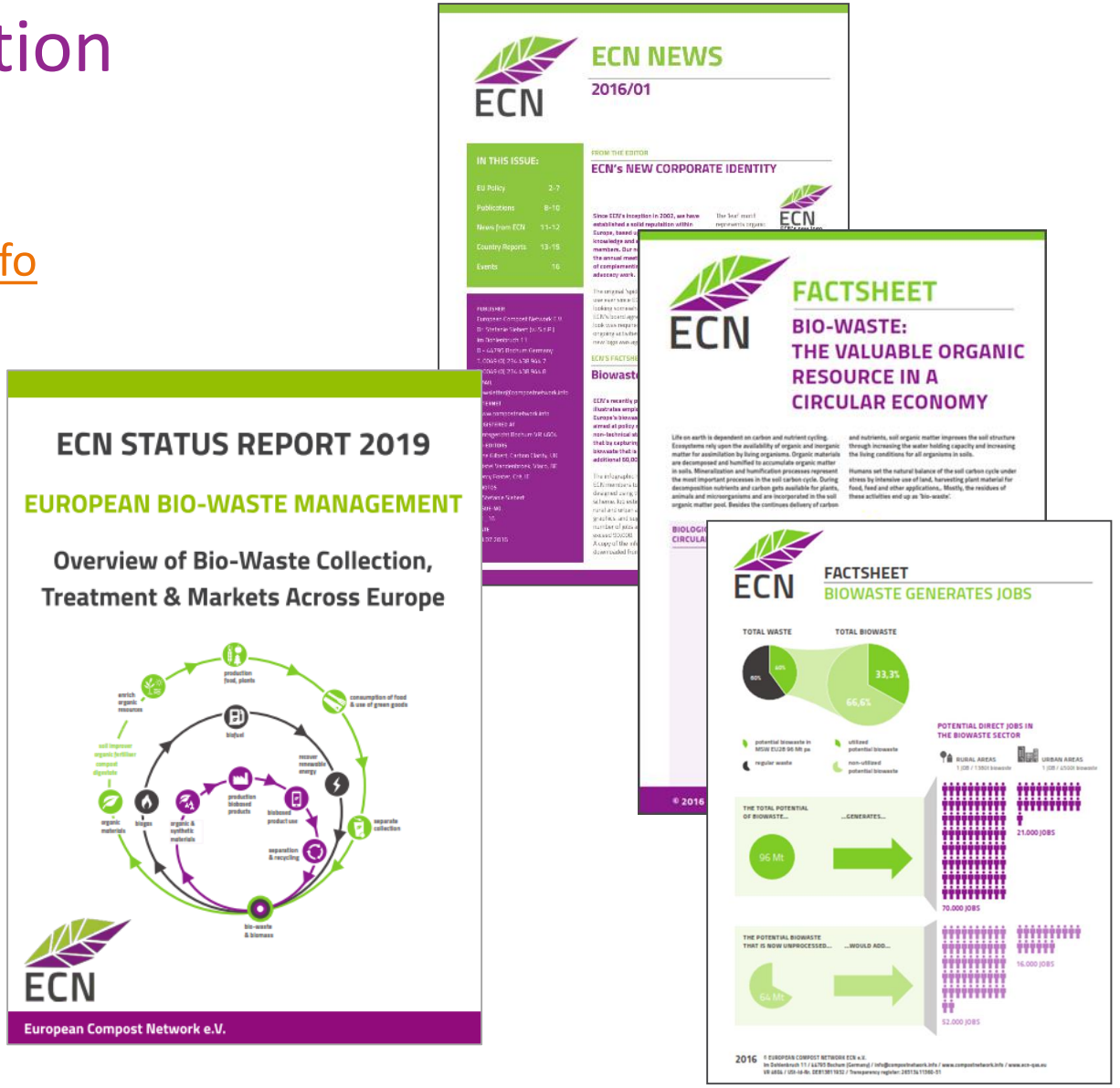
Further information

ECN Homepage:

www.compostnetwork.info

- ECN Status Report
- Factsheets
- ECN News
- Country reports
- ECN-QAS Manual



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Quality Assurance for Compost and Digestate

Targets of the European Quality Assurance Scheme for Compost and Digestate ECN-QAS

- Harmonisation of the compost quality and requirements 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
- **Promotion of recycling of organic waste materials «from waste to product»**

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