ESPP Working Meeting

Policies and tools for the bio-nutrient circular economy
Carbon, Nutrients and Soils

European Compost Network ECN
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Executive Director of ECN e.V.
2 December 2015, Brussels
Content

- The European Compost Network

- EU Policies on Secondary Raw Materials
  - Policy Relations
  - Key Role of Biowaste
  - ECN Policy Recommendations

- The Organic Cycle
  - Benefits of Recycling of Organic materials
  - Nutrients and Organic Matter Potential of Biowaste
  - Organic Carbon in Soils
  - Humus Reproduction
  - Further Policy Recommendations
The European Compost Network

- Network for the organic waste recycling sector in Europe
- Promoting sustainable recycling practices in composting, anaerobic digestion and other biological treatment processes of organic resources
- Integrated organic waste recycling solutions generating high quality products for the benefit of consumers and the environment
The European Compost Network

Objectives

- Achieve a EU legal framework that supports separate collection, biological treatment of organic residues and use of quality assured compost and digestate products

- Facilitate favourable commercial conditions and opportunities for companies, (local) governments and other stakeholders in Europe working on products from organic waste, by facilitating research, stimulating international project cooperation etc.

- Achieve Europe wide implementation of compost and digestate quality assurance schemes, use ECN-QAS as a benchmark

- Increase knowledge and know-how amongst stakeholders, via networking platforms, information dissemination, educational campaigns, etc.
The European Compost Network - Membership

Status of ECN Membership
72 Members from 28 European Countries

- Biowaste Organisations (22)
- Companies (26)
- Academic Institutes (11)
- Governments (3)
- Non-profit Environmental Organisations (10)

ECN represents more than 2.500 treatment plants with more than 30 M tpa treatment capacities in 28 European countries.
EU Policies on Secondary Organic Materials

EU Circular Economy

- **EU Action Plan** on Circular economy (date: 2 Dec. 2015)
- EU proposal for the **revision of waste legislation** (date: 2 Dec. 2015)
- EU proposal for the **revision of the EU Fertilisers Regulation** (date: Q1 2016)
  - More flexible regulation with the aim to place fertiliser and **new products from recycling and recovery processes**, which should be CE labelled, on the European Market
  - Expanding the scope of the regulation on fertilisers (**incl. organic fertilisers**), soil improvers and growing media, liming materials
  - For all materials environmental and healthy criteria will be included in the regulation
  - In addition specific requirements for the different products will be described in annexes
Developments in EU Fertilisers Regulation

Product specific annexes

- Compost and digestate, based on the technical proposal of JRC – End-of-Waste criteria for compost and digestate, published 1/2014
- Struvite
- Ashes from biomass incineration, sludge incineration etc.
- Biochar

Procedures and scope of application (not yet fixed)

- Formal agreement of the annexes as quasi 'End-of-waste-criteria' after expert discussion of the Commission
- Scope of application; fertilisers, soil improvers and growing media

New proposal on EU Fertilisers

Q1 2016
Key role of Biowaste in Circular Economy

1. It closes biological material and nutrient cycles, and reduces the linear economy of landfilling waste.

2. It produces biobased products which can replace scarce resources and fossil based products such as peat, mineral fertilizers and fossil fuels. This will reduce reliance on the importation of these resources and the use of compost will have long-term beneficial effects on soils.

3. It creates sustainable jobs at local level and job opportunities are created for future generations.

100 Mio. tons of biowaste creates 20,000-50,000 new jobs
**EU Policy Recommendations**

Moving towards a more circular economy needs to be accompanied by **updating the existing waste legislation** in Europe.

- **Set an obligation for implementing separate collection of biowaste** in the member states as a guiding principle.
- **Establish targets for biowaste recycling** (biowaste recycling targets based on separate collection) as a fundamental and result-oriented driver to secure investment in sustainable recycling of biowaste.
- **Finalise the end-of-waste criteria for compost and digestate**, so as to facilitate further developments of European markets for these products.
- **Develop a comprehensive product – resource-based – waste legislation** to support the use of secondary materials recycled from organic waste.
The Organic Cycle

Benefits of Recycling Organic Resources

- Conserving resources
- Reducing the environmental impact of waste disposal
- Mitigating climate change
- Enhancing the functionality of soils
- Feeding an ever-growing global population
- Decoupling product manufacture from fossil fuels
Input for composting and digestate plants

Components of organic materials:

• Organic fraction from MSW (food waste)
• Garden wastes
• Crop residues
• Manures
• Commercial & industrial (e.g. food and green waste)
• (Sewage Sludge)

Source: ISWA 2015
Status on Separate Collection of Biowaste in Europe
based on ECN Country reports

- Potential of Biowaste in Europe: 125 -130 M tpa
- Recycling of Biowaste in Europe: 30  M tpa

~ 100 Mio. t pa are wasted

Sweden:
105 sites, 0.71 million tons of biowaste

Finland:
20 sites, 0.36 million tons of biowaste

United Kingdom:
220 sites, 3 million tons of biowaste

Netherlands:
70 sites, 3.2 million tons of biowaste

Belgium (VLG):
85 sites, 2.7 million tons of biowaste

Germany:
800 sites, 10 million tons of biowaste

Austria:
700 sites, 1.5 million tons of biowaste

Italy:
240 sites, 5.2 million tons of biowaste

European Compost Network (ECN)
Organic Resources and Biological Treatment
# Nutrient and organic matter potential of biowaste

<table>
<thead>
<tr>
<th>Potential of Biowaste</th>
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</thead>
<tbody>
<tr>
<td>Total potential of biowaste</td>
<td>125-130 Mio. tonnes per year</td>
</tr>
<tr>
<td>Potential of biowaste from MSW</td>
<td>90 Mio. tonnes per year</td>
</tr>
<tr>
<td>Compost f.m. (40%)</td>
<td>36 Mio. tonnes per year</td>
</tr>
<tr>
<td>Compost d.m. (dm 65 %)</td>
<td>23.4 Mio. tonnes</td>
</tr>
<tr>
<td>• Organic matter d.m.</td>
<td>8-10 Mio. tonnes</td>
</tr>
<tr>
<td>• Nitrogen d.m.</td>
<td>350.000 tonnes</td>
</tr>
<tr>
<td>• Potassium d.m.</td>
<td>340.000 tonnes</td>
</tr>
<tr>
<td>• Phosphorus d.m.</td>
<td>81.600 tonnes</td>
</tr>
</tbody>
</table>
Organic Carbon in Soils

> 45% of European soils are degraded in soil organic matter (COM(2006)231)\(^1\)

World-wide situation\(^2\)

- 80% of the world’s agricultural land suffers moderate to severe erosion
- 10 million ha of agricultural land are lost through soil erosion every year in the world
- Over last 40 years ~30% of world’s cropland has become unproductive


Benefits of Organic Matter in Soils

- Increase of water holding capacity in soils
  - Reduction of climatic impacts
  - (Heavy rain falls)

- Facilitate reworking
  - Reduction of fossil fuels

- Decrease of soil loss
  - Reduction of erodability

- Increase of soil warming
  - To enhance crop production in spring

- Benefits of Organic Matter (Humus)
  - Increase of soil activity
    - Better soil structure, higher delivery potential for nutrients

- Stabilise soil structure
  - Better infiltration
  - Better trafficability

- Increase the potential to save nutrients
  - Increase of the nutrient delivery potential

- Phyto sanitary effects
  - Reduction of soil decease
Humus Reproduction of Organic Resources

- Agricultural humus management
  - Crop rotation

- Internal biomass production
  - Manure and slurry

- Exogenous biomass production
  - Secondary fertiliser
### Humus Management in Agriculture

<table>
<thead>
<tr>
<th>Source Material</th>
<th>Organic Carbon</th>
<th>Corg in stabilised humus</th>
<th>Humus-C reproduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mature compost (40 t/ha in 3 years)</td>
<td>21%</td>
<td>51%</td>
<td>2,600 kg/ha</td>
</tr>
<tr>
<td>Slurry (30 m³/ha * yr)</td>
<td>43%</td>
<td>21%</td>
<td>100 kg/ha</td>
</tr>
<tr>
<td>Straw (7 t/ha * yr)</td>
<td>49%</td>
<td>21%</td>
<td>600 kg/ha</td>
</tr>
<tr>
<td>Green manure (60 t/ha * yr)</td>
<td>52%</td>
<td>14%</td>
<td>500 kg/ha</td>
</tr>
</tbody>
</table>

### Diagram:

- **Organic Resources and Biological Treatment**
- **Humus-C reproduction**
  - Green manure, beet leaves, grass clippings: < 15%
  - Slurry, straw, liquid digestate: 20% - 30%
  - Fresh compost, stable manure, solid digestate: 35% - 45%
  - Mature compost: > 50%

Source: BGK/FAL 2005: Organic Fertilisation
# Humus and Fertiliser Value of Compost and Digestate

<table>
<thead>
<tr>
<th>Biowaste Potential</th>
<th>Compost [f.m.]</th>
<th>Digestate [f.m.]</th>
</tr>
</thead>
<tbody>
<tr>
<td>90.000.000 t</td>
<td>36.000.000 t</td>
<td>81.000.000 t</td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>kg/t Compost [f.m.]</th>
<th>t</th>
<th>kg/m³ Digestate [f.m.]</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>N total</td>
<td>9,11</td>
<td>327.960</td>
<td>4,95</td>
<td>400.950</td>
</tr>
<tr>
<td>P₂O₅ (P total)</td>
<td>4,68</td>
<td>168.480</td>
<td>1,70</td>
<td>137.700</td>
</tr>
<tr>
<td>K₂O (K total)</td>
<td>7,74</td>
<td>278.640</td>
<td>2,08</td>
<td>168.480</td>
</tr>
<tr>
<td>Humus-C</td>
<td>71,00</td>
<td>2.556.000</td>
<td>5,00</td>
<td>405.000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>€/t Compost [f.m.]</th>
<th>€</th>
<th>€/m³ Digestate [f.m.]</th>
<th>€</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Fertiliser Value</td>
<td>12,35</td>
<td>444.600.000</td>
<td>5,88</td>
<td>476.280.000</td>
</tr>
<tr>
<td>Humus-C Value</td>
<td>12,02</td>
<td>432.720.000</td>
<td>0,83</td>
<td>67.230.000</td>
</tr>
</tbody>
</table>

Calculation based on the BGK certificates on average nutrients and Humus-C contents for biowaste compost and liquid digestate from biowaste.
Further Policy Recommendations

Revision of the CAP reform

- Assessment of the good agricultural and environmental condition (GAEC)
  - Increased support for agri-environmental measures through including carbon sequestration in cross-compliance regulation
  - Support of the use of recycled nutrients in agriculture

Revision of the Renewable Energy Directive

- Expanding the scope to renewable materials (bio-based and recycled products incl. compost and digestate)

Revision of Lead Market Initiative for Bio-based Products

- Market incentives for supporting of bio-based and recycled (P-) products
EU Commission Roadmap on the Revision of the EU Fertilisers Regulation published

On 22 October 2015, the EU Commission has published the roadmap on the revision of the EU Fertilisers Regulation (EC) No 2003/2003. With this initiative, the Commission aims to create a level playing field for all fertiliser materials and to facilitate the cross-border market for fertilisers from secondary raw materials.

Following up the revision of the EU Fertilisers Regulation is a concrete step forward towards a Circular economy. This initiative will boost investment in production and uptake of effective, safe, innovative fertilisers produced from organic and secondary materials in line with the circular economy model by transforming waste into nutrients for crops. This more efficient use of secondary raw materials can offer significant environmental benefits, reduces dependency on import of critical raw materials outside of the EU, as well as an increased variety of high quality fertilising products.

The European Compost Network will follow up the discussion in the EU Fertilisers Working Group. The next meeting is scheduled for 27 November 2015.

The roadmap on the revision of the EU Fertilisers Regulation can be downloaded here.

News on Circular Economy

New Circular Economy Package announced for 2nd December

At the Scottish Resources Conference (8 Oct. 2015) the EC’s Director of Green Economy, Kęstutis Sadauskas had announced that the European Commission’s (EC) Circular Economy Package will be released on 2 December.
European Compost Network

Announcement

ORBIT2016

Conference Dates: 25 - 28 May 2016
Deadline for Abstract submission: 31 December 2015
Early registration deadline: 29 February 2016
Full Paper Submission: 31 March 2016

Thanks for your attention!