

European Biogas Association

Fertilizer WS

**Combining safety and innovation in
digestates**

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EBA

European Biogas Association

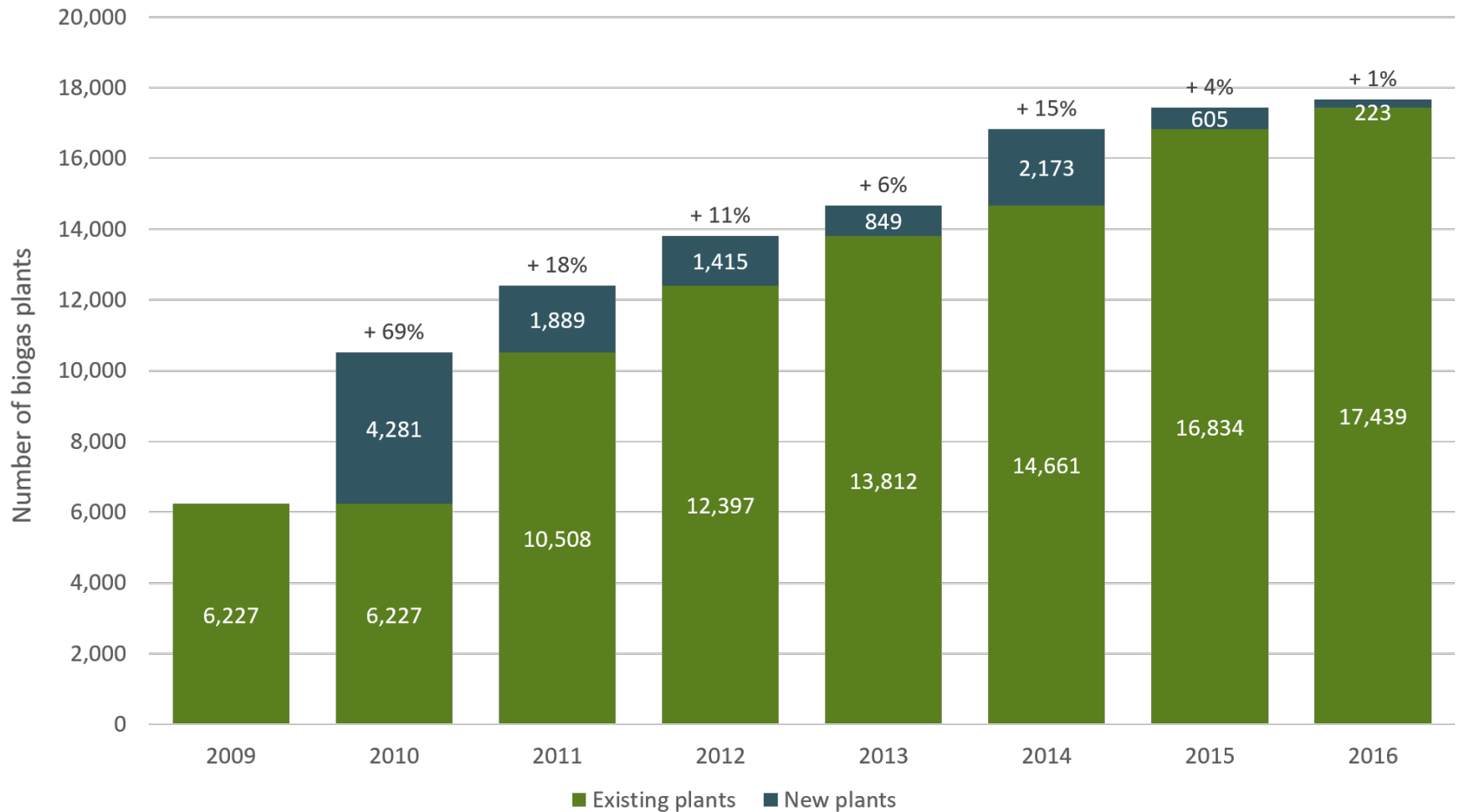
26 countries – 36 National Organisations 58 Companies – representing >7,000 stakeholders



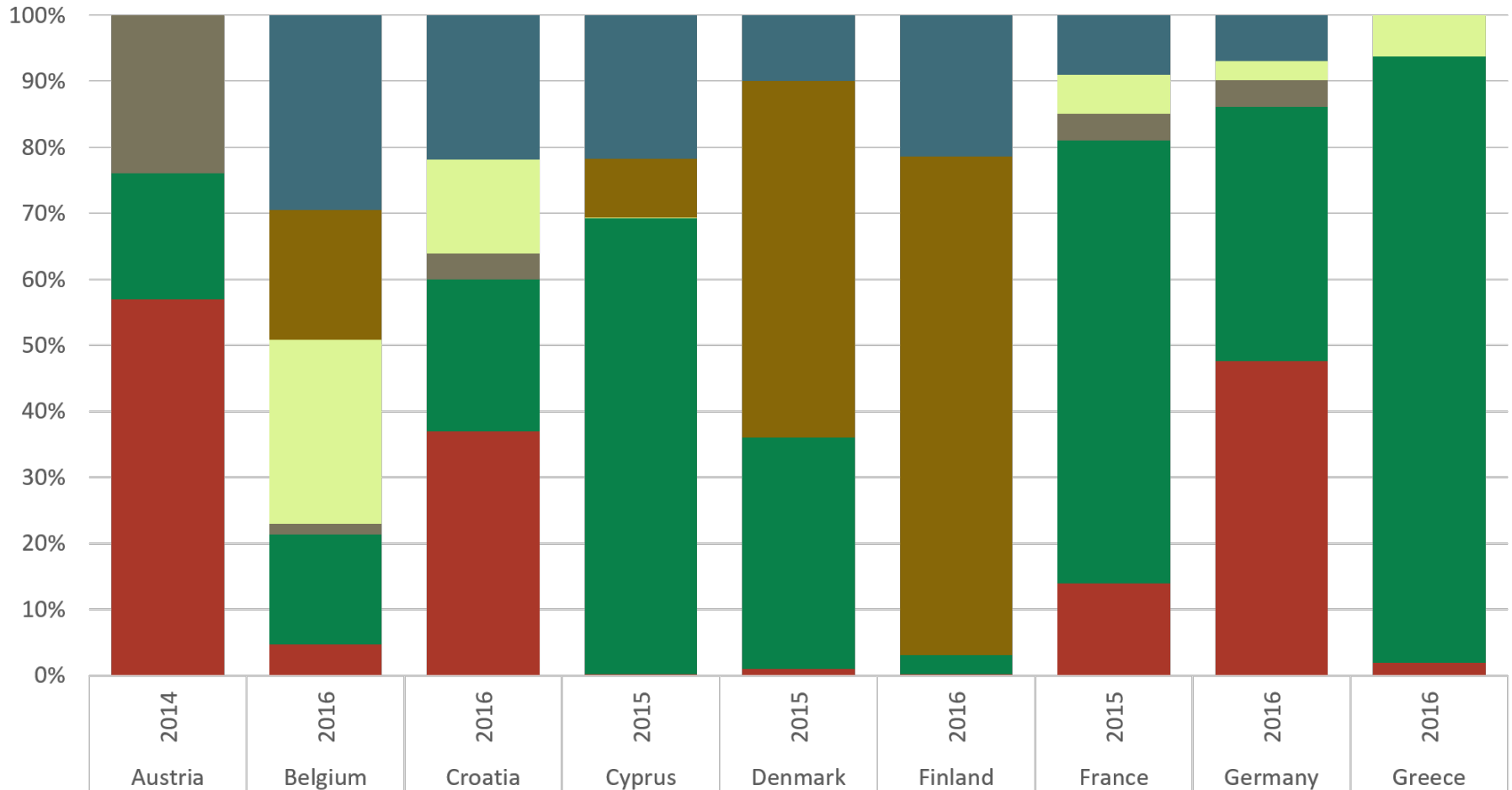
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Evolution of the number of biogas plants in Europe



Feedstock use for biogas production in European countries

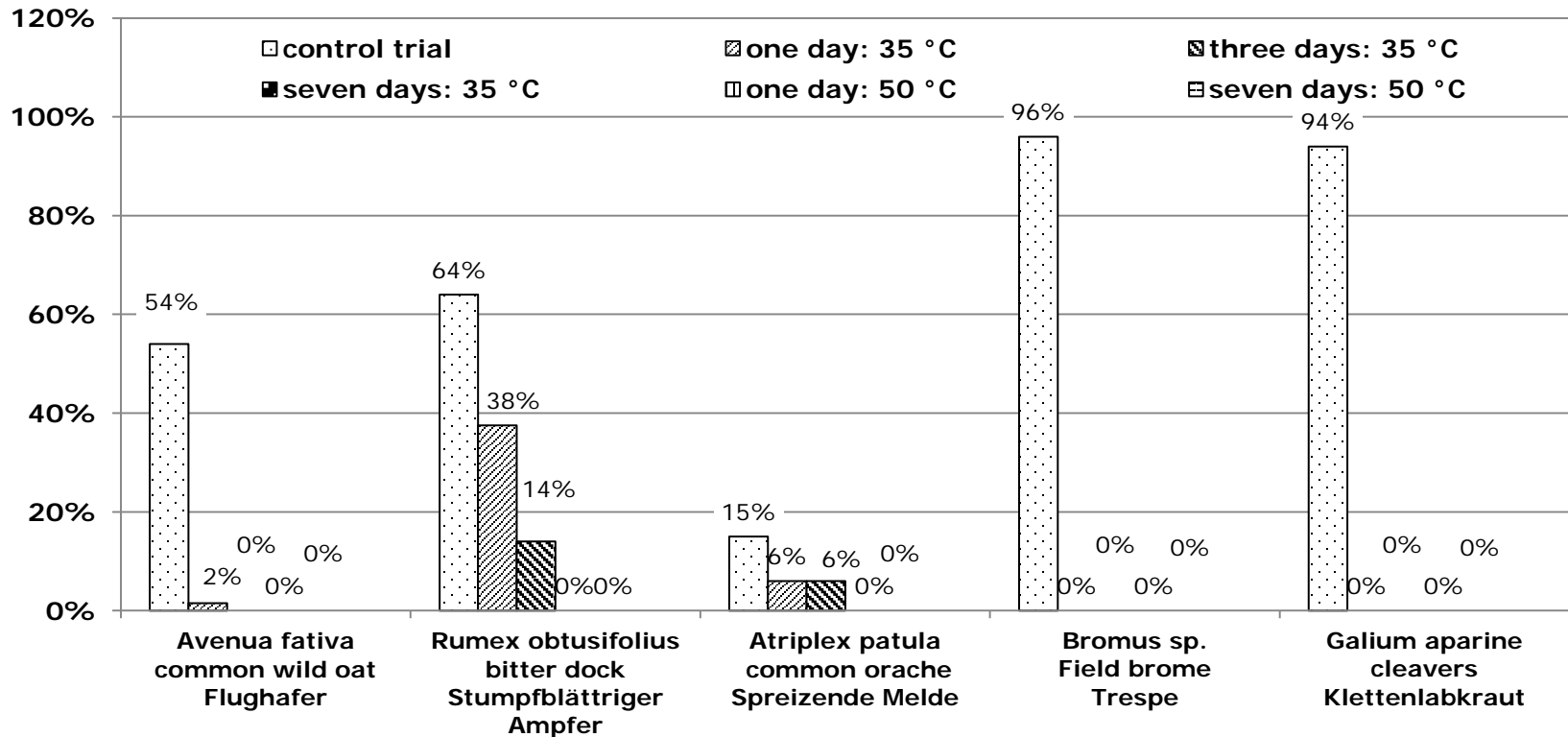


■ Energy crops ■ Agri residues ■ Biowaste, municipal waste ■ Industrial (food and beverage) ■ Sewage ■ Other waste fraction

Mass percentage (landfill waste not included)

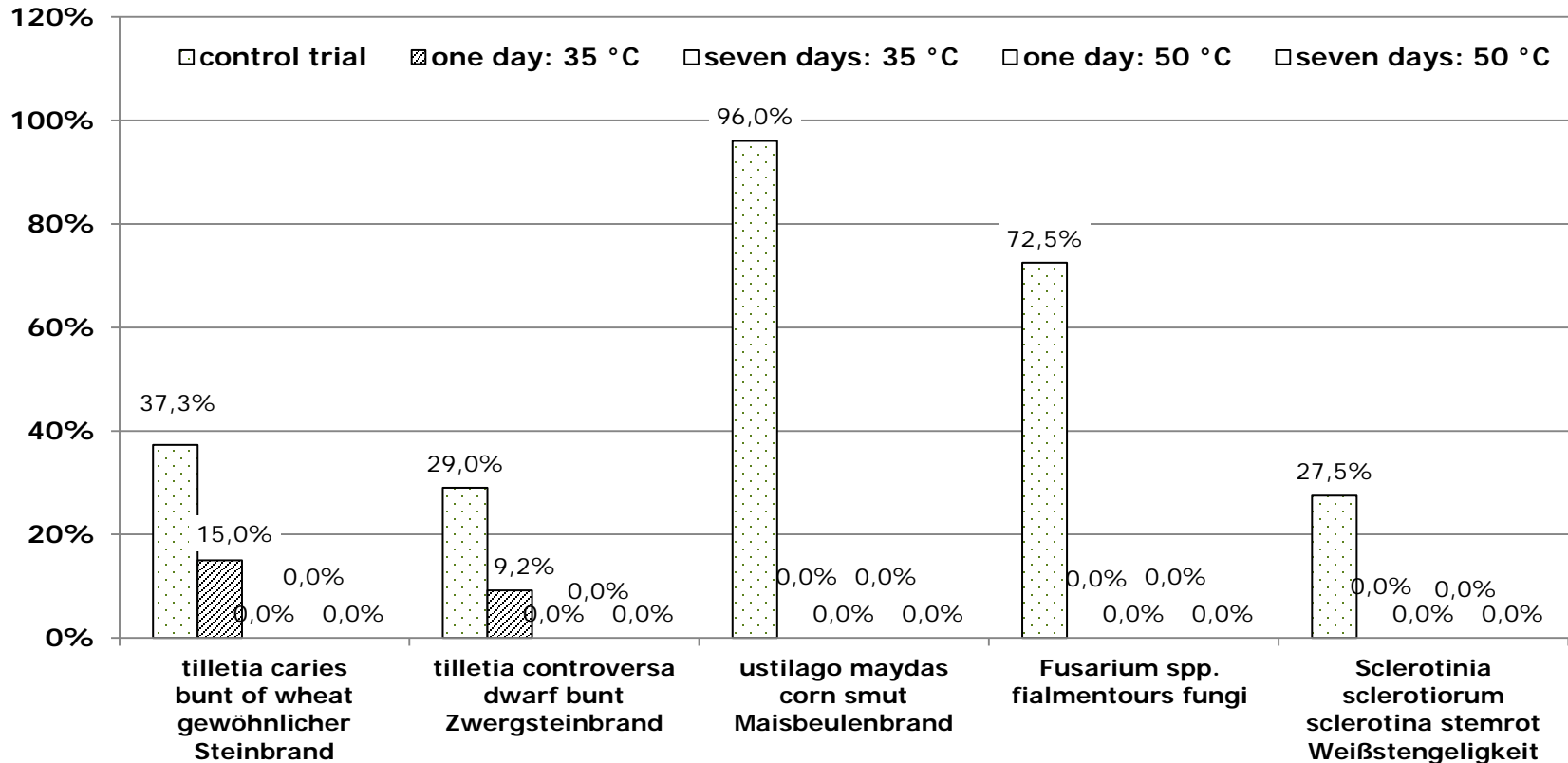


Germination ability of digested weed seeds (Pfundtner et al. 2010)

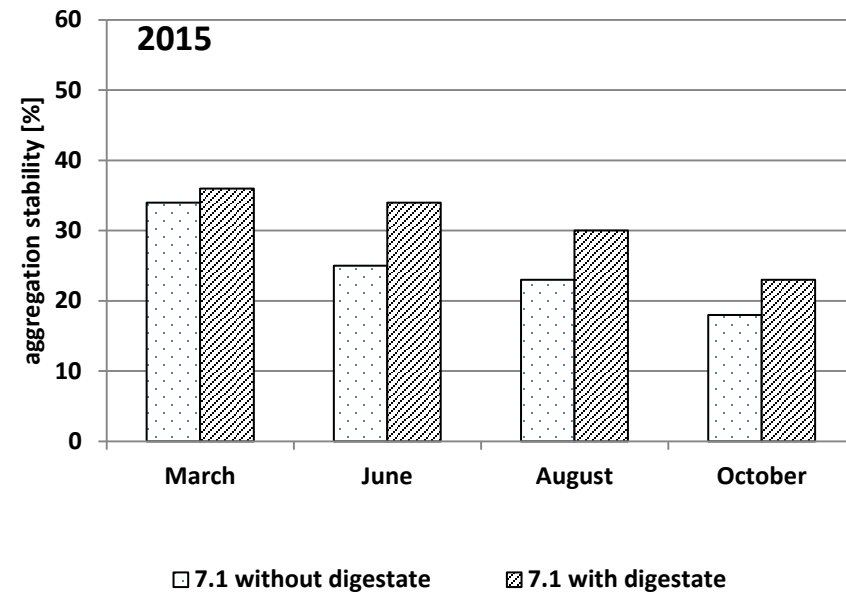
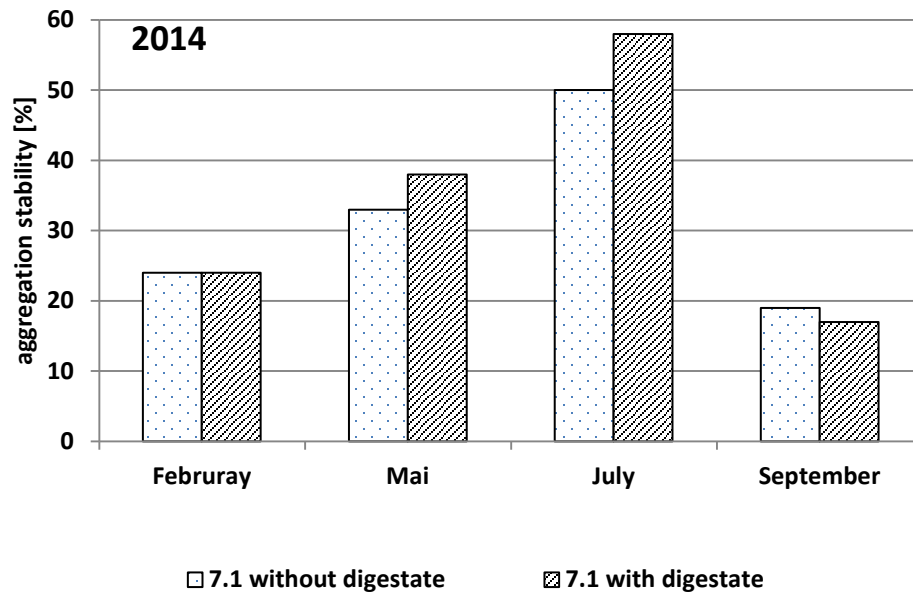


■ Jaques Fuchs reports in 2017 that plant propagules of japanese knotweed (*reynoutria japonica*) were destroyed within 7 days via digestion at 37 °C

Germination ability of digested plant pathogens (Pfundtner et al. 2010)



Influence to the aggregat stability of soil (Hülsbergen 2016, Petz 2010)



■ Multiannual application brings:

- Lower bulk density of soil
- Increase of field capacity

~ 13 %

~ 15 %

Main nutrient content of unprocessed compared to solid fraction of digestate (source: EBA)

Main nutrient content of raw digestate n > 2 000

		10 % quantil	average	90 % quantil
[%]	DM	3	6	9
[% of FM]	C _{org}	0,6	1,6	3
	N _{total}	0,13	0,3	0,5
	NH ₄ N	0,04	0,2	0,4
	K ₂ O	0,06	0,14	0,23
	P ₂ O ₅	0,05	0,1	0,15

Solid fraction of separated digestate n > 100

		10 % quantil	average	90 % quantil
[%]	DM	20	35	86
[% of FM]	C _{org}	4	10	30
	N _{total}	0,4	0,6	1
	NH ₄ N	0,01	0,1	0,25
	K ₂ O	0,15	0,5	1,3
	P ₂ O ₅	0,2	0,6	1,3

heavy metal content within untreated digestate

(source: EBA) n > 1.000

		Analyzing results (EBA)			Possible limit value of fertilizer reg.	Not reached	
Substance		Min.	Average	Max.		amount + (%)	
[mg/kg DM]	Cr	0,1	15,1	107	≤ 100	3 (0,3 %)	
	Cr VI				≤ 2		
	Cd	0,0	0,4	2,4	≤ 1	44 (4 %)	
	Pb	0,0	5,8	71,6	≤ 120	1 (0,0 %)	
	Hg	0,0	0,1	2,8	≤ 1	1 (0,1 %)	
	Ni	0,2	13,7	800	≤ 50	20 (1,8 %)	
	Zn	2,7	311	1.720	≤ 800	35 (3,1 %)	
	Cu	0,9	87,5	1.770	≤ 300	41 (3,6 %)	
	C ₂ H ₅ N ₃ O ₂ (Biuret)					Not present	So far not analyzed
	As (Arsenic)					≤ 40	

Digestion and upgrading of digestate expects fast development

- **Digestate is indeed a bulky organic fertilizer however it brings value for plant nutrition and soil properties therefore also raw digestate sure shall be part of fertilizer regulation**
- **Anaerobic Digestion is the important last step of circular economy and bioeconomy recovering nutrients**
- **Promising studies are going on developing upgrading of digestate**
- **We also expect further development in Anaerobic digestion through research, companies and plant operators**

A few points

- **CMC 2: avoid the use of „untreated“ waste material**
- **CMC 4 u 5: proposed time temperature profile will hinder development**
 - *include a validated process for time temperature profile*
- **PFC 3 Soil Improver: Also bulky fertiliser bring benefits to soil:**
 - *no minimum limit value for DM and Corg. but DM and Corg. shall be declared*
- **PFC 6 Plant biostimulants: humification helps avoid plant stress**
 - *Add under point 1 humification*
- **PFC's: Change sanitation requirements for the product as received to: „Shiga-toxin producing E.coli species shall not be present in the EU fertilizing product”**
- **REACH regulation: exemption for digestate otherwise operators would not register digestate as fertilizer but remain under waste regime**

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Thank you

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