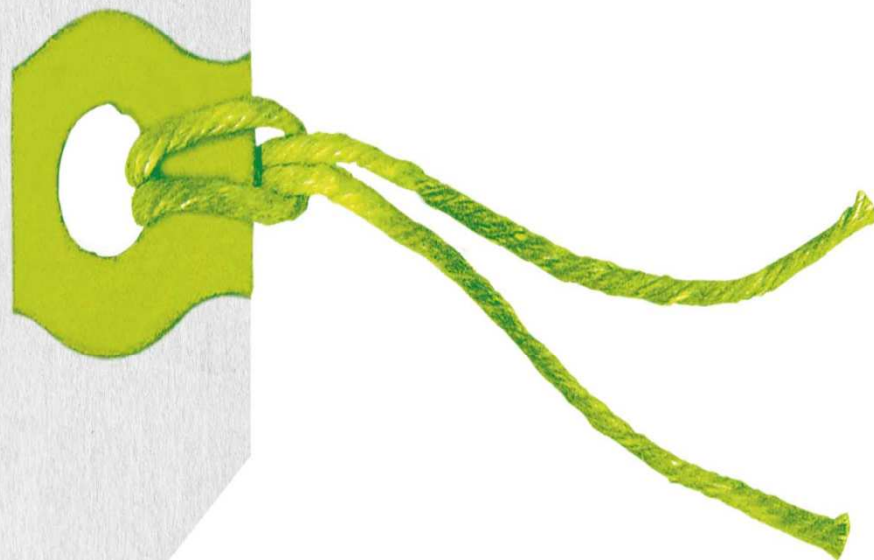


**TOGETHER WE
MAKE TOMORROW
MORE BEAUTIFUL**



Integrated sustainable approach of sewage sludge in the Flemish region of Belgium

Valencia 17.06.2011

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Sewage sludge in the Flemish region

General introduction



- Densely populated
- Industrialised
- Regional environmental policy



Sewage sludge in the Flemish region

General legal framework: OVAM

1981: Public Waste Agency of Flanders (OVAM)



Staff: ca.400

Public institution headed by the Flemish Minister for the environment



Sewage sludge in the Flemish region

General legal framework: Task of OVAM

To prepare legislation, implement and supervise the implementation of the Flemish legislation on **waste** management and **soil** remediation.

- Waste Decree(1981)=>Waste&Material Decree(2011)
- Decree on soil remediation & soil protection (1997)

The overall goal is to contribute to a better environment and quality of life by:

- ensuring a sustainable waste and material management
- preventing soil contamination and ensuring soil remediation.

Sewage sludge in the Flemish region

Some facts and figures about Flanders



Population: 6,1 M
Area: 13.599 km²
Provinces: 5
Municipalities: 308
Inhabitants/km²: 441



5 M
23.255 km²
3
220



Sustainable sewage sludge policy in the Flemish region

1. Investments in treatment plants for household wastewater

1990 : ° Aquafin by Flemish Government (FG)

2002 : ° Implementation plan for sludges by FG

247 sewage works (111 in aggl. > 10000 IE) in 2010

Treatment degree : 78% - 4.5 M inhabitants



Sustainable sewage sludge policy in the Flemish region

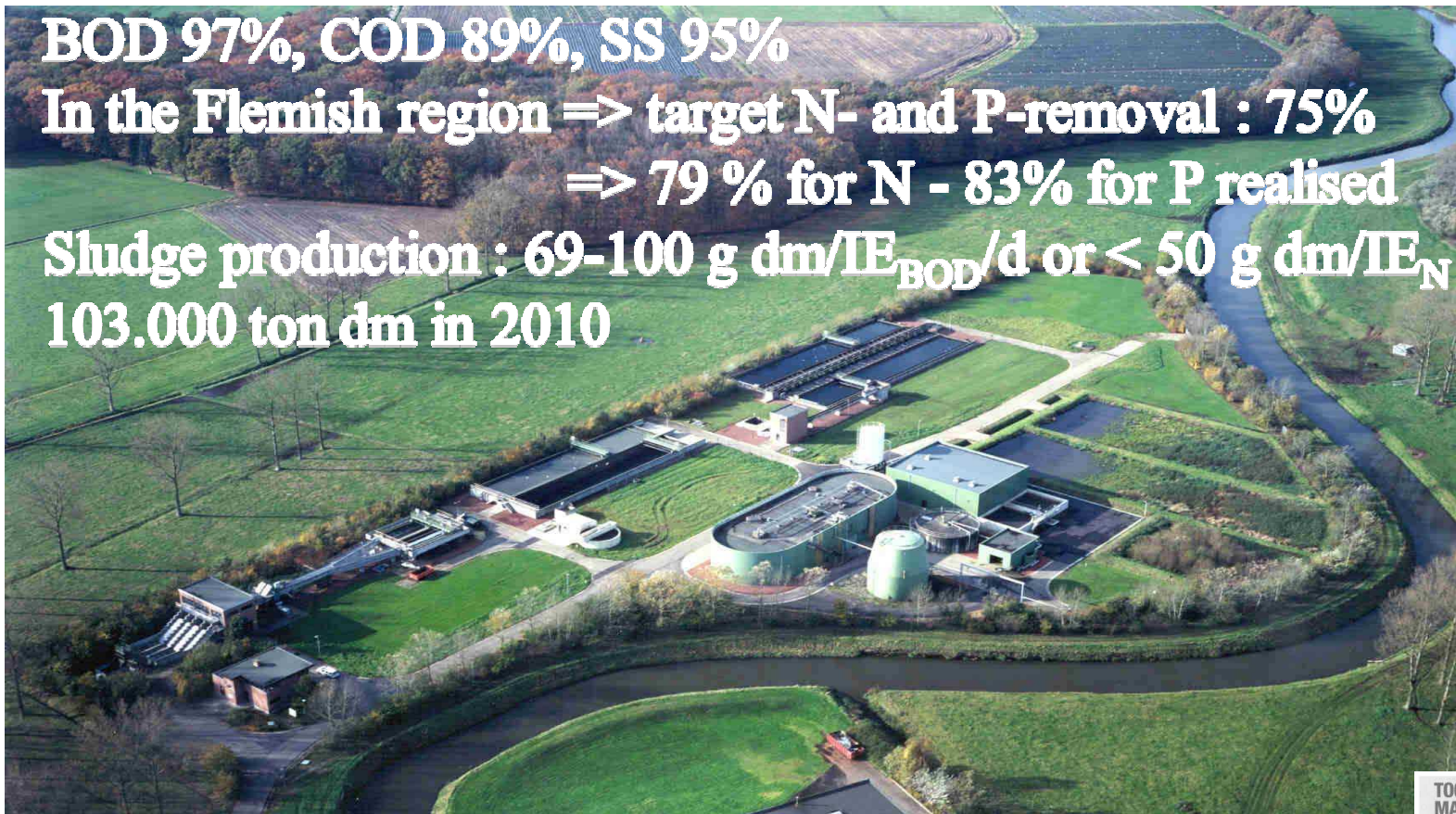
2. WWTP : focus on sludge management

BOD 97%, COD 89%, SS 95%

In the Flemish region \Rightarrow target N- and P-removal : 75%

\Rightarrow 79 % for N - 83% for P realised

**Sludge production : 69-100 g dm/IE_{BOD}/d or < 50 g dm/IE_N
103.000 ton dm in 2010**



Sustainable sewage sludge policy in the Flemish region

3. Sludge management

Average sewage sludge quality
(in dry matter)

% o.m. : 58

mg Zn/kg : 1302

mg Cu/kg : 306

mg Pb/kg : 149

mg Cr/kg : 72

mg Ni/kg : 30

mg Cd/kg : 4.3

mg Hg/kg : 0.9

Organic parameters,...

Vlarea : soil improver:

900

375

300

250

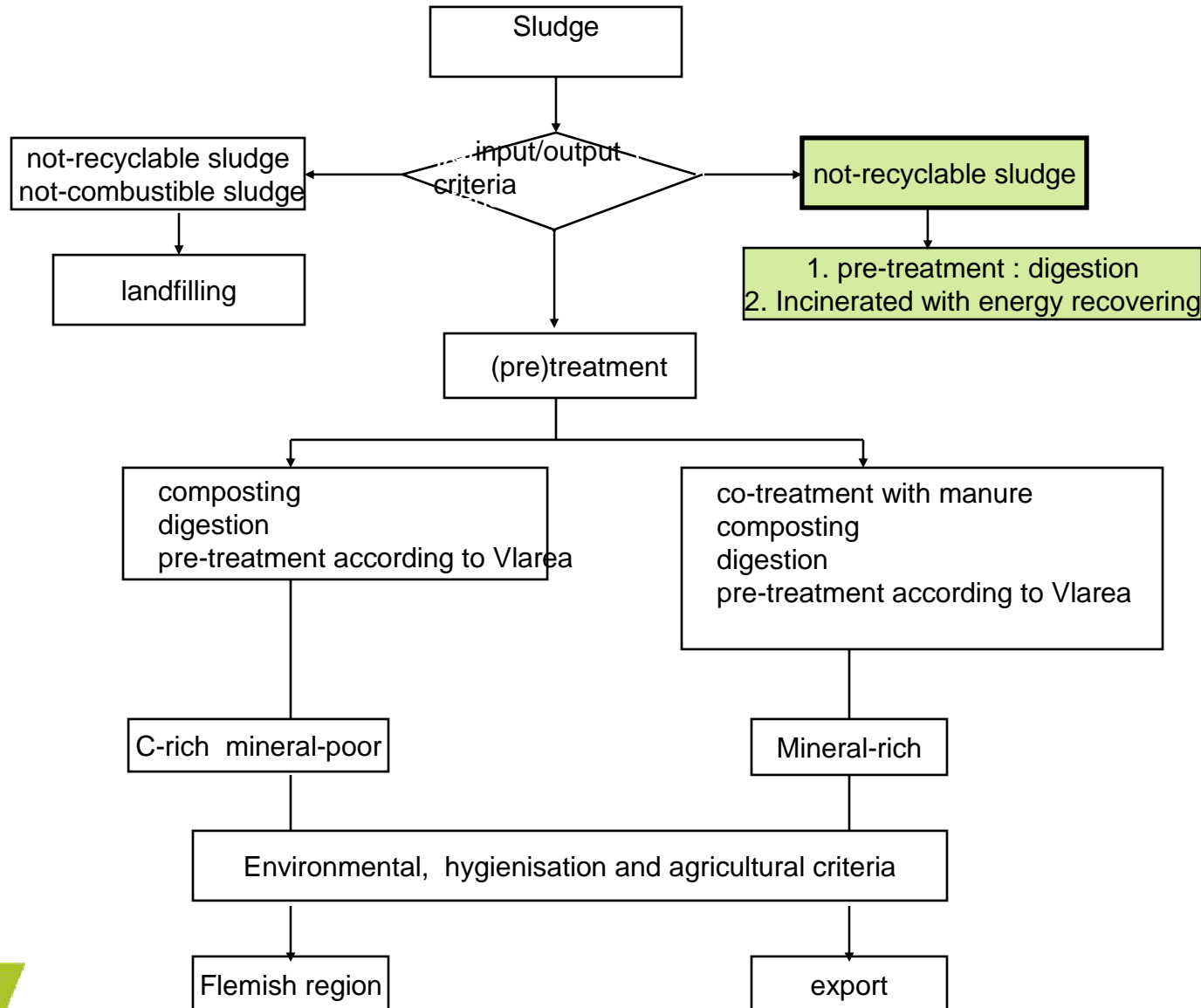
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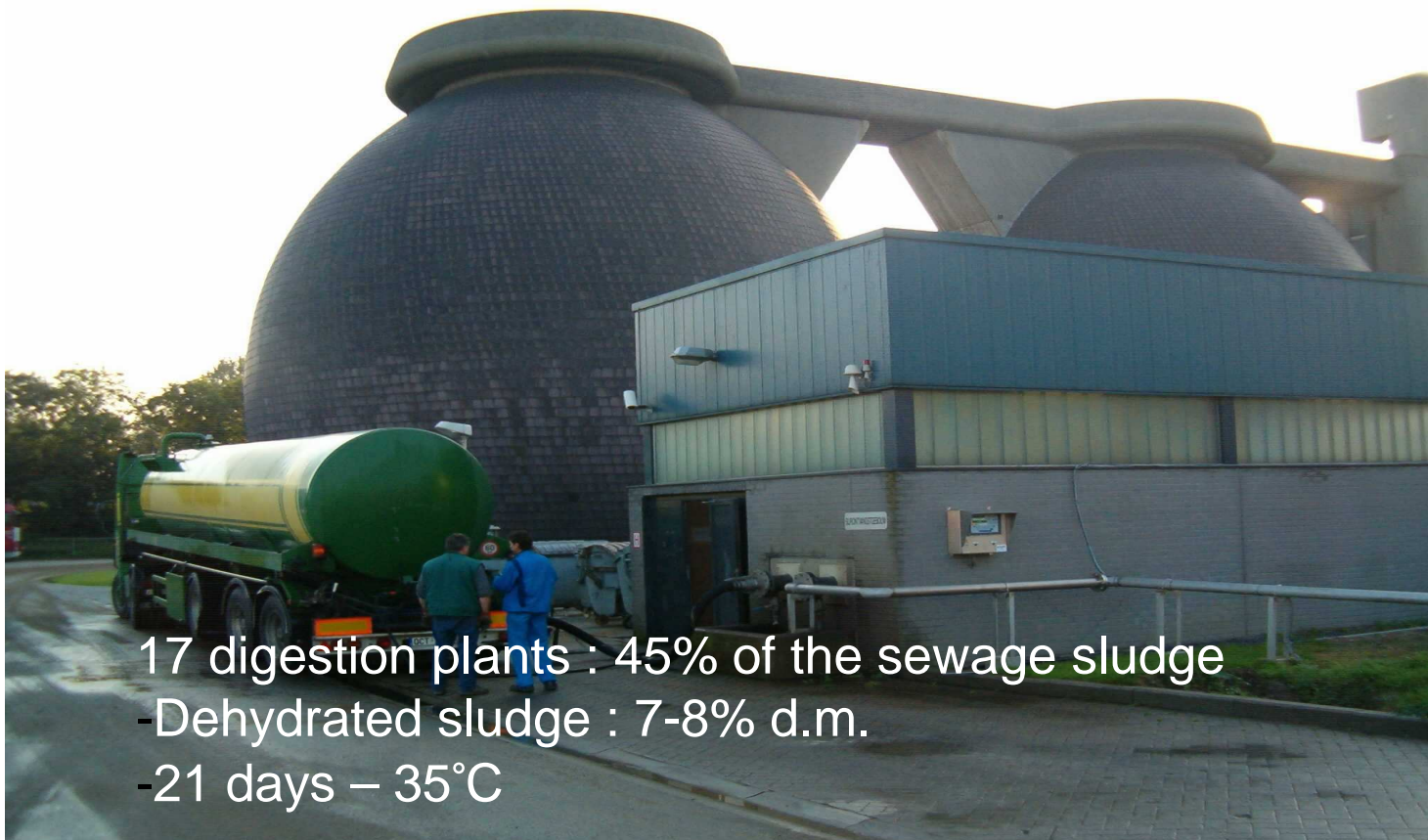


Sustainable sewage sludge policy in the Flemish region : 4. Treatment options for all sludge



Sustainable sewage sludge policy in the Flemish region

5. Energy from sewage sludge: (1) biogas



17 digestion plants : 45% of the sewage sludge
- Dehydrated sludge : 7-8% d.m.
- 21 days – 35°C



Sustainable sewage sludge policy in the Flemish region

6. Energy from sewage sludge: (2) incineration



1. Waste feeder
2. Revolving fluidised bed
3. Fluidising air
4. Flue gas
5. Deflector plate
6. Non-combustibles discharge chute
7. Inclined nozzle plate



Sustainable sewage sludge policy in the Flemish region

7. Evolution of the treatment of sewage sludge : 1998-2009

| In % | 1998 | 2000 | 2003 | 2006 | 2009 |
|-------------------------|--------|--------|--------|--------|---------------|
| Soil improver | 23.8 | < 0.1 | 11.8 | 0 | 0 |
| Incineration | 33.6 | 68.8 | 71.7 | 88.9 | 90.2 |
| Landfilling | 42.6 | 15.7 | 0.8 | 0 | 0 |
| Covering landfill sites | - | 15.5 | 15.7 | 11.1 | 9.8 |
| Total (%) | 100 | 100 | 100 | 100 | 100 |
| Total (ton d.m.) | 67.400 | 76.800 | 76.100 | 84.900 | 92.100 |



Sustainable sewage sludge policy in the Flemish region

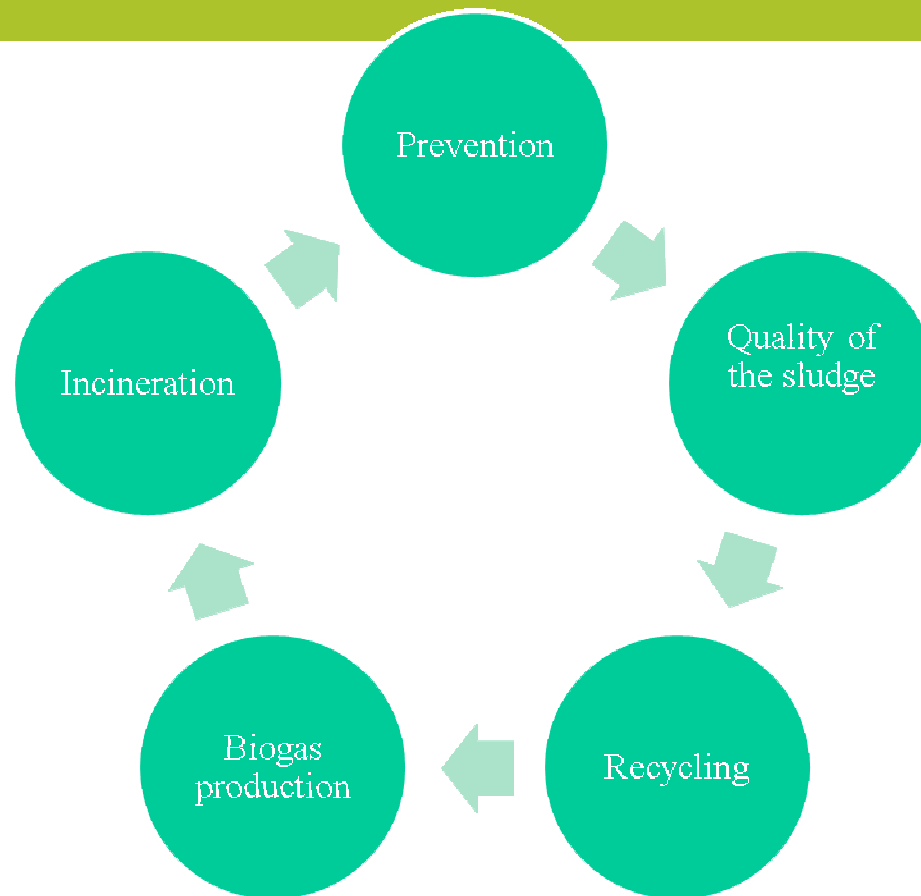
8. Conclusions : (1) max. harmonisation between waste, water, soil and energy policy is needed

- ✓ Flanders implied the Landfill directive strategically to reduce GHG-emissions : no sewage sludge and biodegradable household waste to landfill since 2007
- ✓ European Urban Wastewater directive : WWTP's operational in agglomerations >10000 IE
- ✓ European Water framework directive : good quality of ground and surface water (2015)
- ✓ European Waste framework/ Sludge directive : Flemish regulation for the use of quality sludge as soil improver
- ✓ European/Belgian action plan on renewable Energy : certificates for green electricity and heat



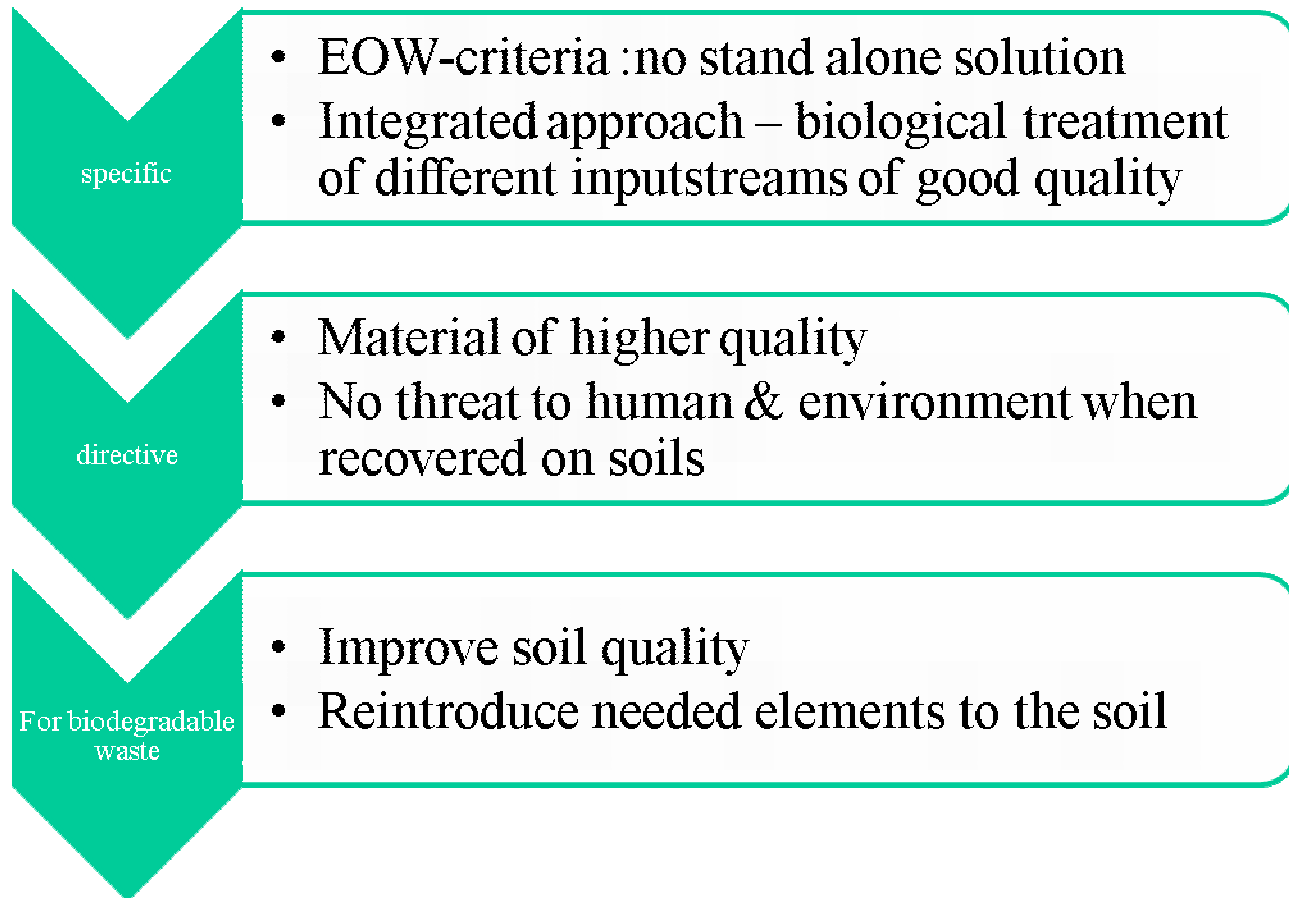
Sustainable sewage sludge policy in the Flemish region

9. Conclusions : (2) C2C- options for sludge



Sustainable sewage sludge policy in the Flemish region

10. Conclusions : (3) Integrate C2C in sludge and biodegradable waste policy => close the biological and technical cycle



Thank you
for your attention !

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