



EurEau

Rue du Luxembourg 47-51,  
B-1050 Brussels, Belgium  
Tel: +32 (0)2 706 40 80  
Fax: +32 (0) 2 706 40 81  
secretariat@eureau.org

# Answers to the Sewage Sludge Questionnaire

EurEau document 4.10.2016

compiled by Erik Salminen and Saijariina Toivikko/FIWA

Aim of the questionnaire was to map the current situation of the sewage sludge treatment and utilization as well as to get information about the future developments in this field. Especially new developments in the national legislations are in the focus.

Answers were collected between 6<sup>th</sup> of July and 21<sup>st</sup> of September 2016. Twenty-two answers were received. Notice that answers are based on the best evaluation of national experts. Information may vary from the official statistics.

## 1. Name, organisation and country of participants

Amount of answers: **22**

The answers were received from the following organisations and will be sorted in alphabetical order:

Name	Organization	Country
Jean-Pierre Silan	Belgaqua (Aquaval)	Belgium
Greet De Gueldre	Belgaqua (Aquafin)	Belgium – Flanders
Ioanna Ioannidou	Larnaca Sewerage and Drainage Board	Cyprus
Marcela Zrubková	SmVak Ostrava	Czech Republic
Ellen Mihklepp	Estonian Waterworks Association	Estonia



Sajariina Toivikko	Finnish Water Utilities Association	Finland
Roger Pujol	FP2E	France
Prof. Karl-Georg Schmelz & Andrea Danowski	BDEW	Germany
Argiris Papakonstantinou	DEYAL	Greece
Adrian Kiss	Hungarian Water Utility Association	Hungary
Mazzini Roberto	Utilitalia	Italy
Jean Weicherding	Aluseau	Luxembourg
Stefan Cachia	Water Services Corporation	Malta
Michaël Bentvelsen	Unie van Waterschappen	The Netherlands
Arne Haarr	Norsk Vann	Norway
Pedro Béraud	APDA	Portugal
Madalin Mihailovici	Apa Nova Bucuresti / Veolia	Romania
Ivana Mahrikova	Association of Water Companies	Slovakia
Iztok Rozman		Slovenia
Joaquín Aguilar Jiménez	AEAS	Spain
Anders Finnson	Swedish Water and Wastewater Association	Sweden
Sarah Gilman	Scottish Water (for Water UK)	The UK



## 2. How much sewage sludge is generated in a year in your country (t dm)?

Country	Amount of Sewage Sludge (t dm)
Belgium	49 000 (2014)
Belgium – Flanders	92 840 (2015)
Cyprus	1000 (Larnaca)
Czech Republic	159 162
Estonia	23 375
Finland	150 000
France	1 000 000
Germany	1 809 000 (2014)
Greece	121 800 (2011)
Hungary	2013:179.378 2016:225.351(est.) 2023:237.870(est.) 2027:250.390 (est.)
Italy	963.492 (Estimated amount using data from 15/20 regions)
Luxembourg	10 000
Malta	8 442 (2015)
The Netherlands	320 000
Norway	132 055 (2014)
Portugal	121 000
Romania	250 000 (est.)
Slovakia	57 500
Slovenia	28 310 (2014)
Spain	1 500 000
Sweden	200 510
The UK	1 470 000 (Raw sludge, at disposal 1,09 million)



### 3. What is the percentage of sludge use in a year in your country?

0 %	0.1 – 24.9 %	25 – 49.9 %	50 – 74.9 %	75 – 100 %
-----	--------------	-------------	-------------	------------

Country	Agriculture	Forestry	Green Areas	Incineration	Landfill	Landscaping	Storage	Other
Belgium	52.58	0	0	46.59	0	0	0.83	0
Belgium – Flanders	0	0	0	99.9	0	0	0.01	0
Cyprus	100	0	0	0	0	0	0	0
Czech Republic	38	0	0	2	3	30	0	27
Estonia	16	0	0	0	0	54	11	6
Finland	5	0	60	0	3	30	2	0
France	75	0	0	15	10	0	0	0
Germany	26.1	0	0	59.9	0	11.9	0	2.1
Greece	21	0	0	33	27	2	11	6
Hungary	37.8	0	0	5.6	2	45.7	0	8.9
Italy	76	0	0	9	8	0	0	0
Luxembourg	83.4	0	0	16.6	0	0	0	0
Malta	0	0	0	0	100	0	0	0
The Netherlands	0	0	0	100	0	0	0	0
Norway	66.7	0	13.9	0	8.6	5.6	0	5
Portugal	85	10	0	0	5	0	0	0
Romania	22	0	0	2	64	0	0	12
Slovakia	88.4	0	0	0.6	3	0	8	0
Slovenia	0.7	0	0	57.1	1.2	0	0	41.1
Spain	78.5	0	1.3	7	10	0	0	3.2
Sweden	25	0	29	1	2	24	7	11
The UK	83	0	3	11	0	0	0	3



## 4. Comments on sludge percentages

### Belgium:

Incineration: (2.17%), co-incineration with domestic waste (12.78%), cement kiln (16.44%), other type of energy valorisation (15.20%)

### Belgium – Flanders:

Incineration has three options:

- autothermal mono-incineration: 27,188 t ds
- co-incineration (cement industry) of pellets after drying: 33,364 t ds
- incineration of dewatered sludge: 32,272 t ds

Sludge use in landfill is forbidden since 1997, in agriculture since 1999.

### Czech Republic:

In the Czech Republic these categories are used:

- direct application and recultivation: 30 % (entered under landscaping)
- composting: 38 % (entered under agriculture)
- landfill: 3 %
- incineration: 2 %
- other: 27%

### Estonia:

Some part of the sludge has been used in forestry and some has been sent to landfill, but these unimportant parts are not reflected in researchwork.

### Greece:

- agriculture: includes also the sludge that is treated for soil conditioner
- incineration: includes the sludge that is thermally dried and then transferred for incineration in cement factories as alternative fuel
- other: not-determined management

### Hungary:

By landscaping we mean recultivation / revegetation. The data is extracted from the Hungarian Sewage Sludge Strategy 2014-2023.

### Luxembourg:

Agriculture: 83,39% = 36,11 % agriculture in Luxembourg + 0,01 % agriculture in Germany + 28,18% composting in Luxembourg + 2,19 % composting in Germany + 16,90 composting in France. Some of the exported quantities may be used on green areas, some may be used as landfill.



**Malta:**

8,442 tonnes in 2015.

**Norway:**

- Green areas: amount delivered to commercial producer of soil amendments, this may be used in green areas or in agriculture.
- Landfill: this is for the purpose of landfill cover for landfills that are closed. Normal landfill of sludge is prohibited.
- Landscaping is distributed to parks and other green spaces, which is more or less the same as "green areas".

**Portugal:**

There are several projects to diversify the final destination of sludge, but so far have none have been implemented.

**Slovenia:**

The data is from the National Waste management programme, Table 44 on pg.120

([http://www.mop.gov.si/fileadmin/mop.gov.si/pageuploads/zakonodaja/varstvo\\_okolja/operativni\\_programi/op\\_odpadki.pdf](http://www.mop.gov.si/fileadmin/mop.gov.si/pageuploads/zakonodaja/varstvo_okolja/operativni_programi/op_odpadki.pdf)).

Data is modified. 5,14% of sludge is generated via aerobic and anaerobic bio digestion. 4% is reflected in field "incineration" and 1,14 in field "other".

**Spain:**

Other is energy valorization.

**The UK:**

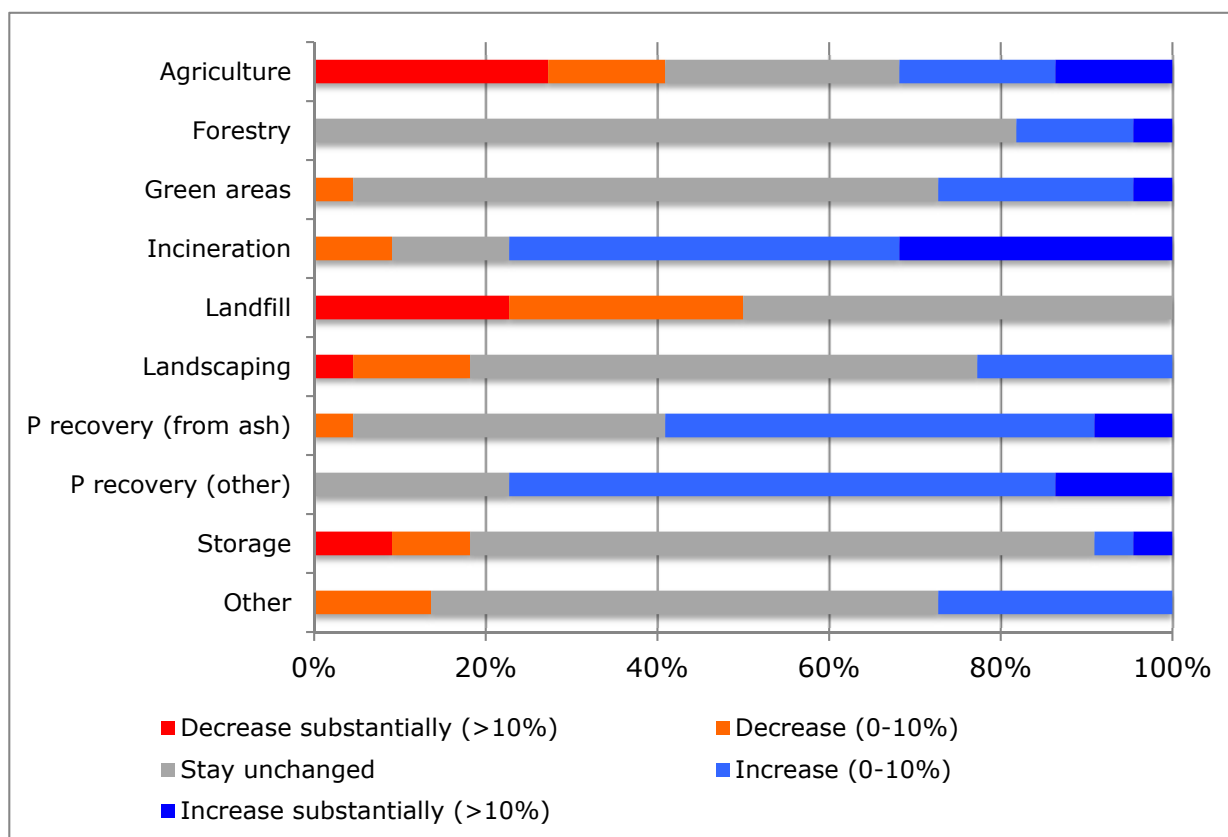
- Green areas = non-agricultural land in UK
- Other = Industrial usage (cement firing/soil manufacture)

Disposal figures given above accounts for digestion losses.



## 5. How do you think sewage sludge utilisation or treatment will develop in the following fields in the next ten years?

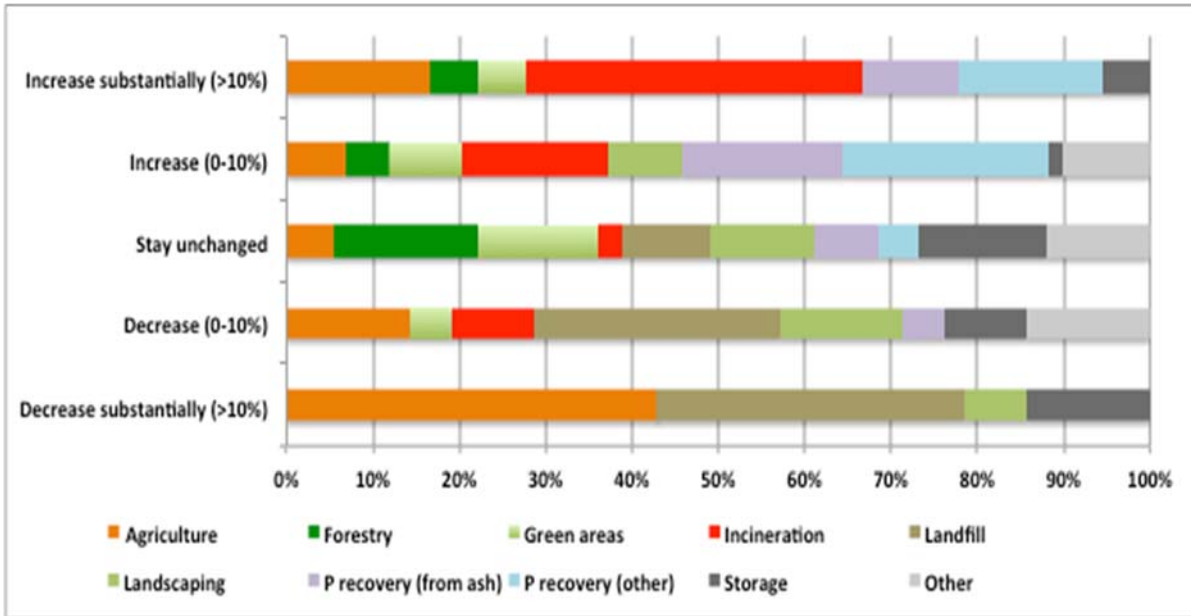
Answer percentages according to utilisation or treatment field:



	<b>Decrease substantially (&gt;10%)</b>	<b>Decrease (0-10%)</b>	<b>Stay unchanged</b>	<b>Increase (0-10%)</b>	<b>Increase substantially (&gt;10%)</b>
	%	%	%	%	%
Other	0	14	59	27	0
Storage	9	9	73	5	5
P recovery (other)	0	0	23	64	14
P recovery (from ash)	0	5	36	50	9
Landscaping	5	14	59	23	0
Landfill	23	27	50	0	0
Incineration	0	9	14	45	32
Green areas	0	5	68	23	5
Forestry	0	0	82	14	5
Agriculture	27	14	27	18	14

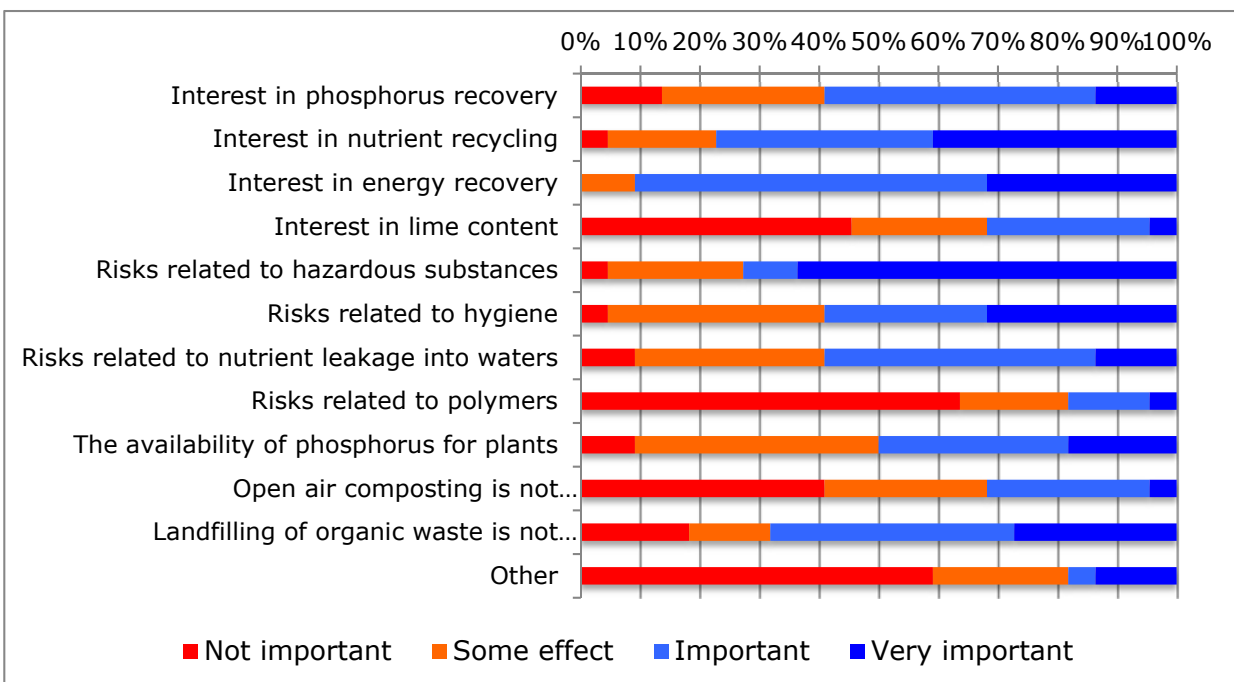


Answer percentages according to increase or decrease in utilisation or treatment:



## 6. What are the driving forces for sewage sludge utilisation and treatment at the moment?

Answer percentages according to utilisation and treatment field:

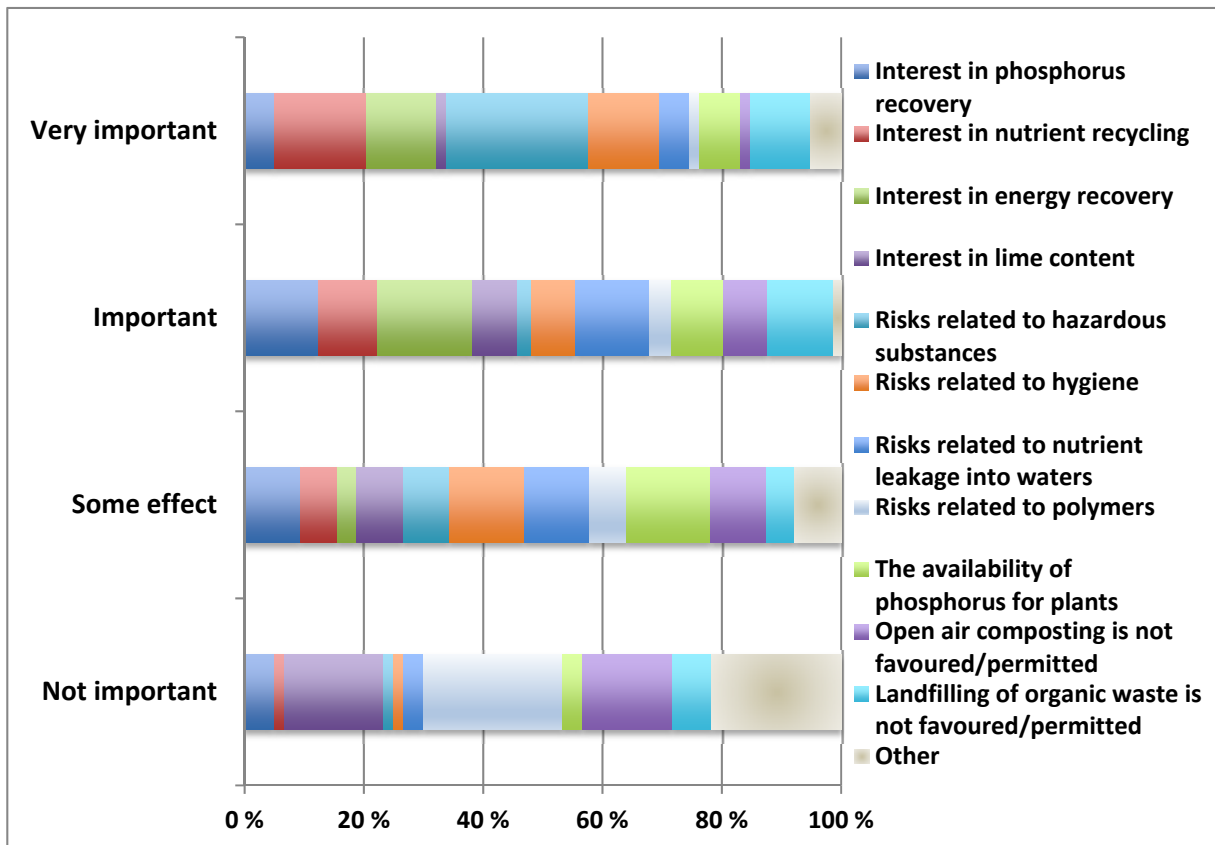






	Not important	Some effect	Important	Very important
	%	%	%	%
Interest in phosphorus recovery	14	27	45	14
Interest in nutrient recycling	5	18	36	41
Interest in energy recovery	0	9	59	32
Interest in lime content	45	23	27	5
Risks related to hazardous substances	5	23	9	64
Risks related to hygiene	5	36	27	32
Risks related to nutrient leakage into waters	9	32	45	14
Risks related to polymers	64	18	14	5
The availability of phosphorus for plants	9	41	32	18
Open air composting is not favoured/permited	41	27	27	5
Landfilling of organic waste is not favoured/permited	18	14	41	27
Other	59	23	5	14

Answer percentages according to importance:





EurEau

## 7. Explain if there has been or will be changes which will affect the treatment and utilisation of sewage sludge in your country (for example in legislation)?

Below answers related to the new legislation are presented.

### **Czech Republic:**

Currently the new sludge decree (sludge utilization in agriculture) is being prepared.

### **Estonia:**

Today we have the document "The end-of-waste criteria for municipal wastewater sediment" as the draft document.

### **Germany:**

New draft of German sewage sludge legislation (proposal published in August 2015).

### **Greece:**

According to the National Plan on Waste Management (CM 49/15.12.2015/GG174A, in accordance to the Directive 2008/98 on waste) the sludge disposal to landfill should be minimized to 5% by 2020 while recovery should be 95 % (energy recovery-agricultural use).

### **Luxembourg:**

Sludge regulation has been changed.

### **Slovakia:**

New Waste Law (2015)

### **Slovenia:**

In 2016 the government of the Republic of Slovenia adopted the National Waste management programme:

([http://www.mop.gov.si/fileadmin/mop.gov.si/pageuploads/zakonodaja/varstvo\\_okolja/operativni\\_programi/op\\_odpadki.pdf](http://www.mop.gov.si/fileadmin/mop.gov.si/pageuploads/zakonodaja/varstvo_okolja/operativni_programi/op_odpadki.pdf)),

### **Spain:**

Soon there will be a new national legislation. Regional governments are continually legislating.

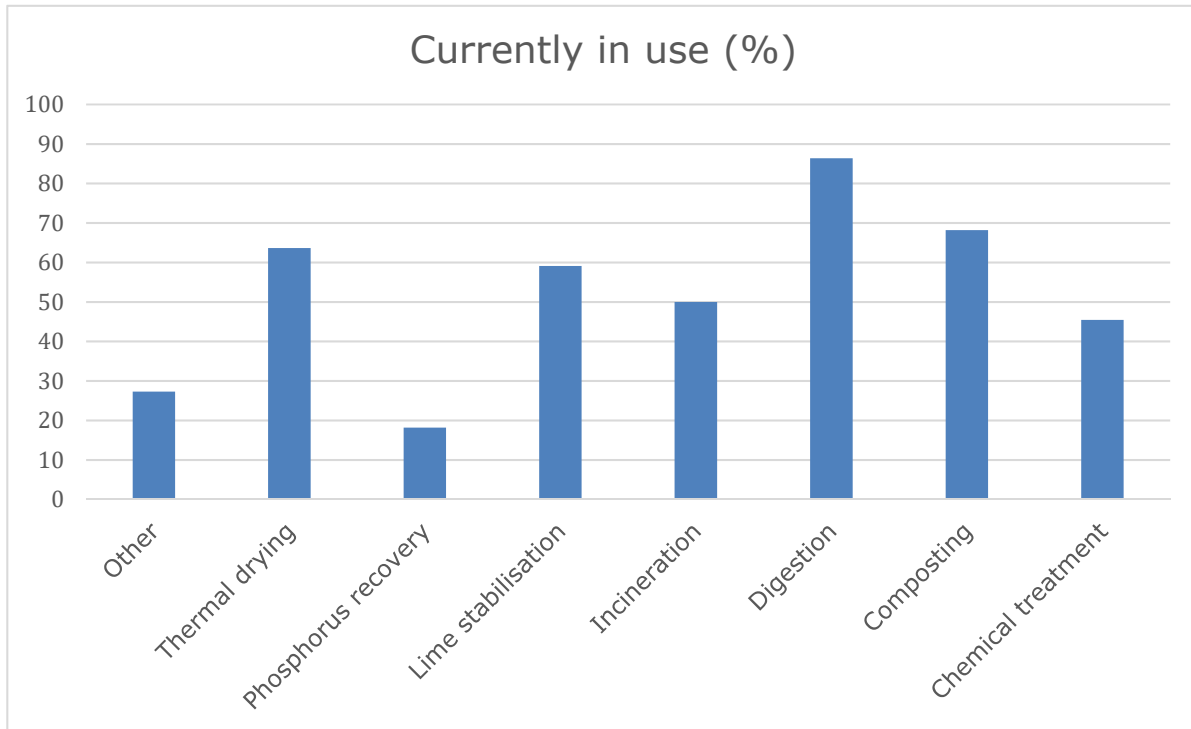
### **Sweden:**

There is a proposal from the Swedish EPA regarding a new sustainable reuse of phosphorus ordinance, which is expected to be decided by the Swedish Government late 2016 or beginning of 2017.



8. How are the following methods utilised in your country now and in the future? You may choose multiple alternatives.

Answer percentages according to sludge disposal methods:



Notice that question has not been clear and thus answers related to the future situation are not comparable and thus not presented.

