



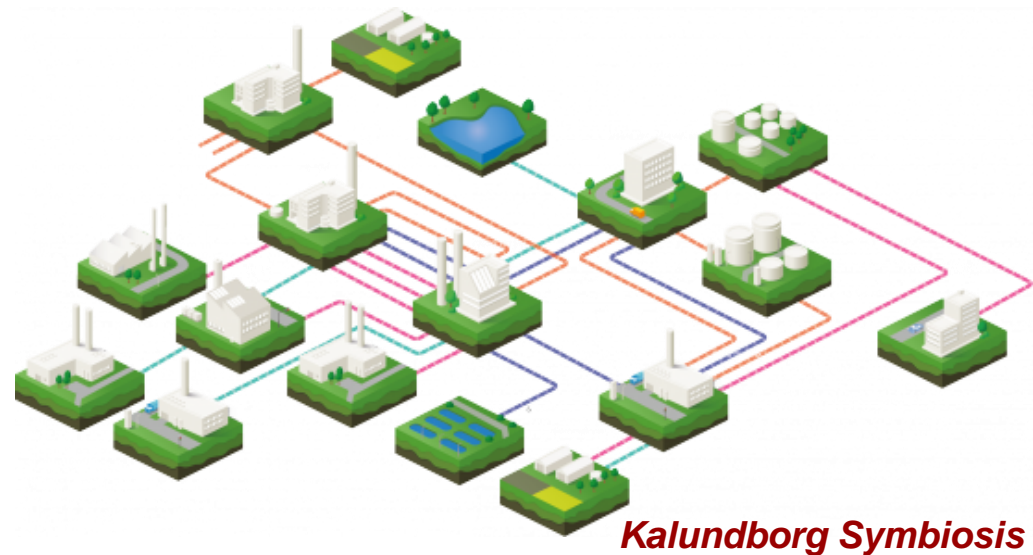
A. Papathanasoglou, M. Panagiotidou, K. Valta, M. Loizidou

**“Investigating the Adequacy of the Institutional Framework for Implementing Industrial Symbiosis in practice: the case of Greece”**

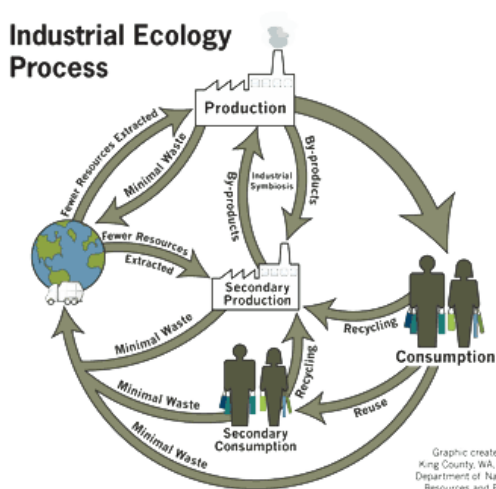


# Definitions

**Industrial Symbiosis'** objective is the **energy, matter** and **water** conservation in order to protect the environment and develop human activities in a sustainable way.



*Kalundborg Symbiosis*

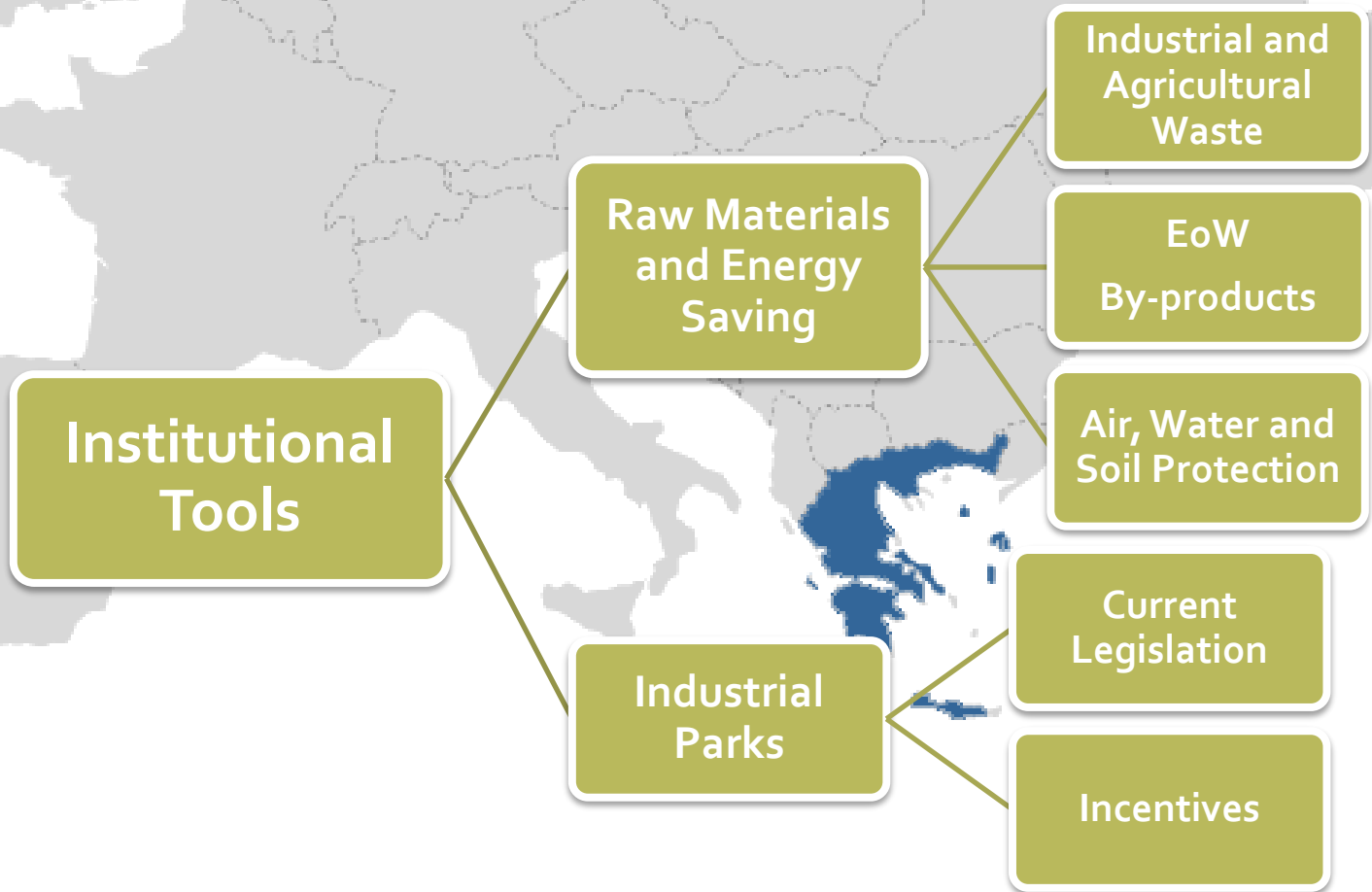


Graphic created by  
King County, WA, USA,  
Department of Natural  
Resources and Parks

IS networks should be organised in **geographic proximity** and applies to all productive sectors and human activities in general.

## Aim of the study

The aim of the study is to investigate the sufficiency of the current **Institutional Framework**



# EU Legislative Framework

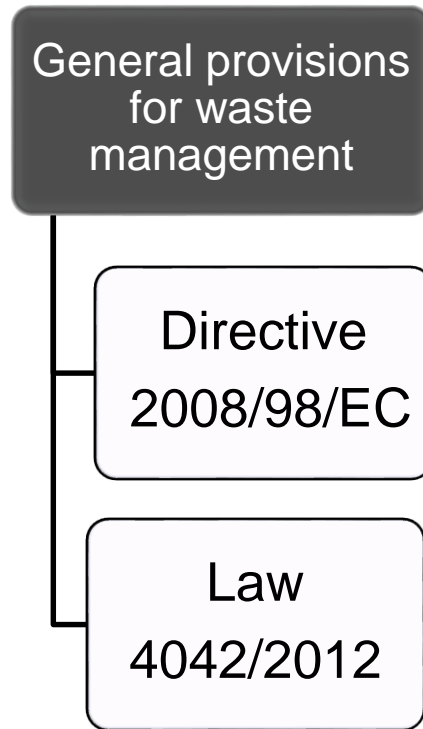
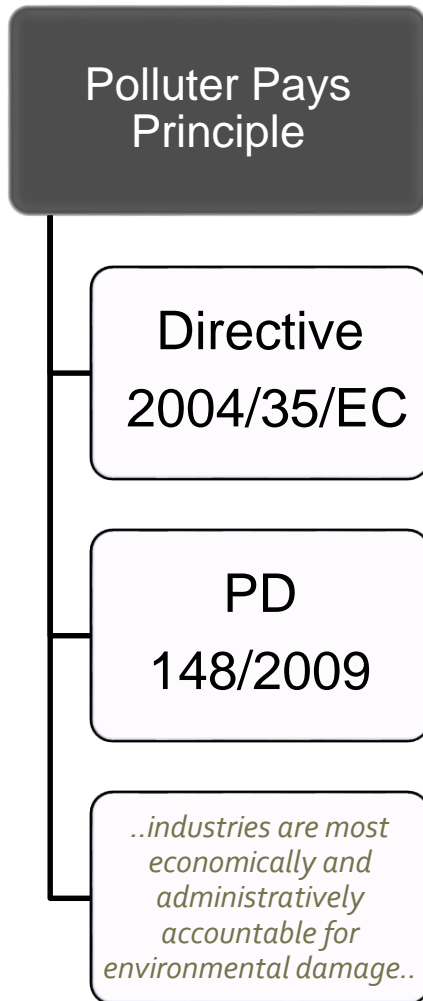
The **main tools** used by the EU to achieve its objectives towards a greener industry are as follows:

1. **LCA - Life Cycle Assessment,**
2. **Eco-Labeling,**
3. **EMAS - Eco-Management and Audit Scheme,**
4. **IED – BAT: Industrial Emissions Directive - Best Available Techniques** and
5. **EoW: End of Waste Criteria.**

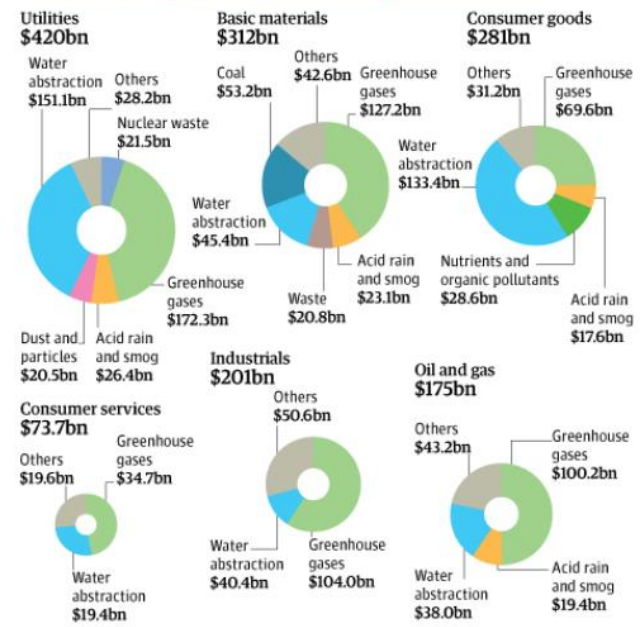


**Waste hierarchy under Directive 2008/98/EC (EC, 2009)**

# Greek Legislative Framework for waste management



The cost of damage to the environment by business sectors

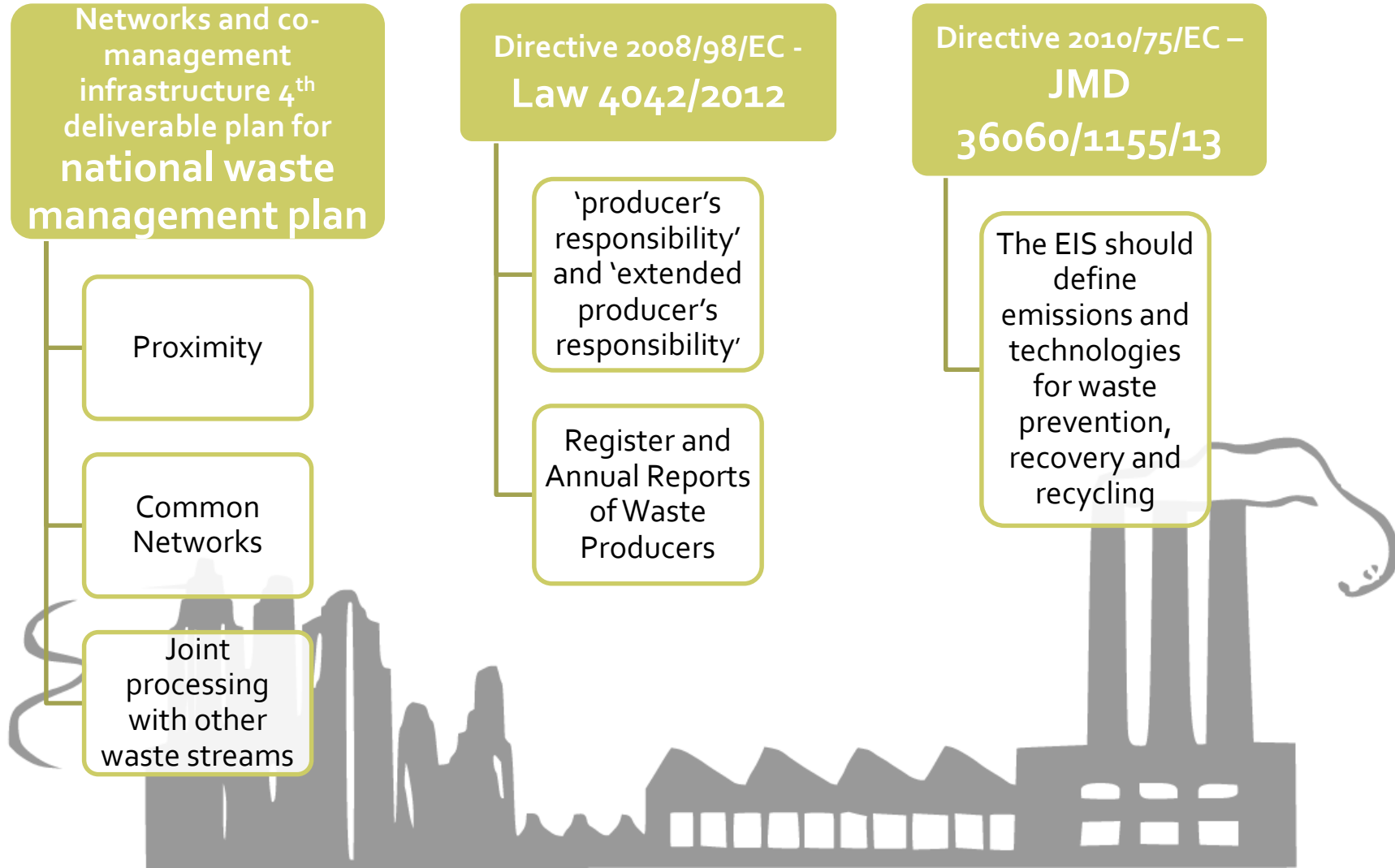


Cost of some other sectors analysed: Financials \$26.7bn, Healthcare \$15.5bn, Technology \$20.3bn, Telecommunications \$8.6bn

SOURCE: TRUCOST

## General Waste Management EU and Greek Regulations

# Industrial Waste Management Regulations



# Agricultural and Livestock Waste Management Regulations

Networks and co-management infrastructure  
4<sup>th</sup> deliverable plan for national waste management plan

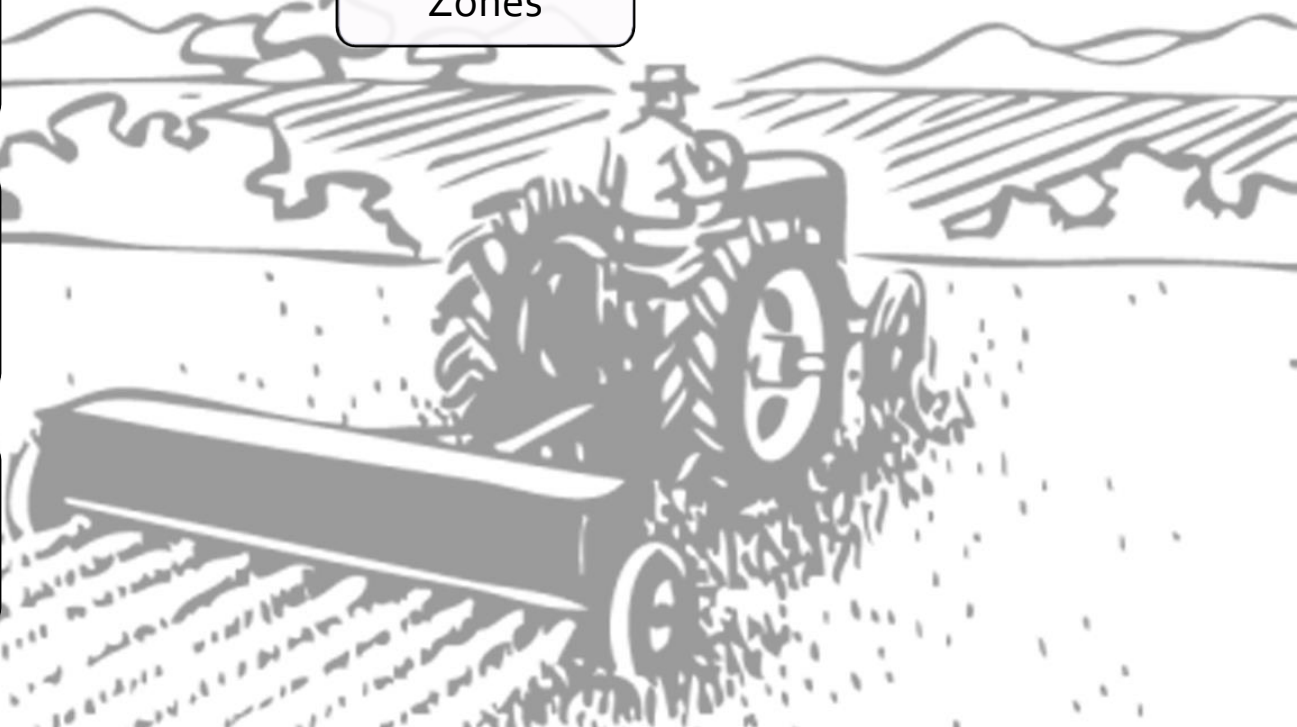
Update of the criteria for the specification of compost

Annual mandatory submission of the waste producer report

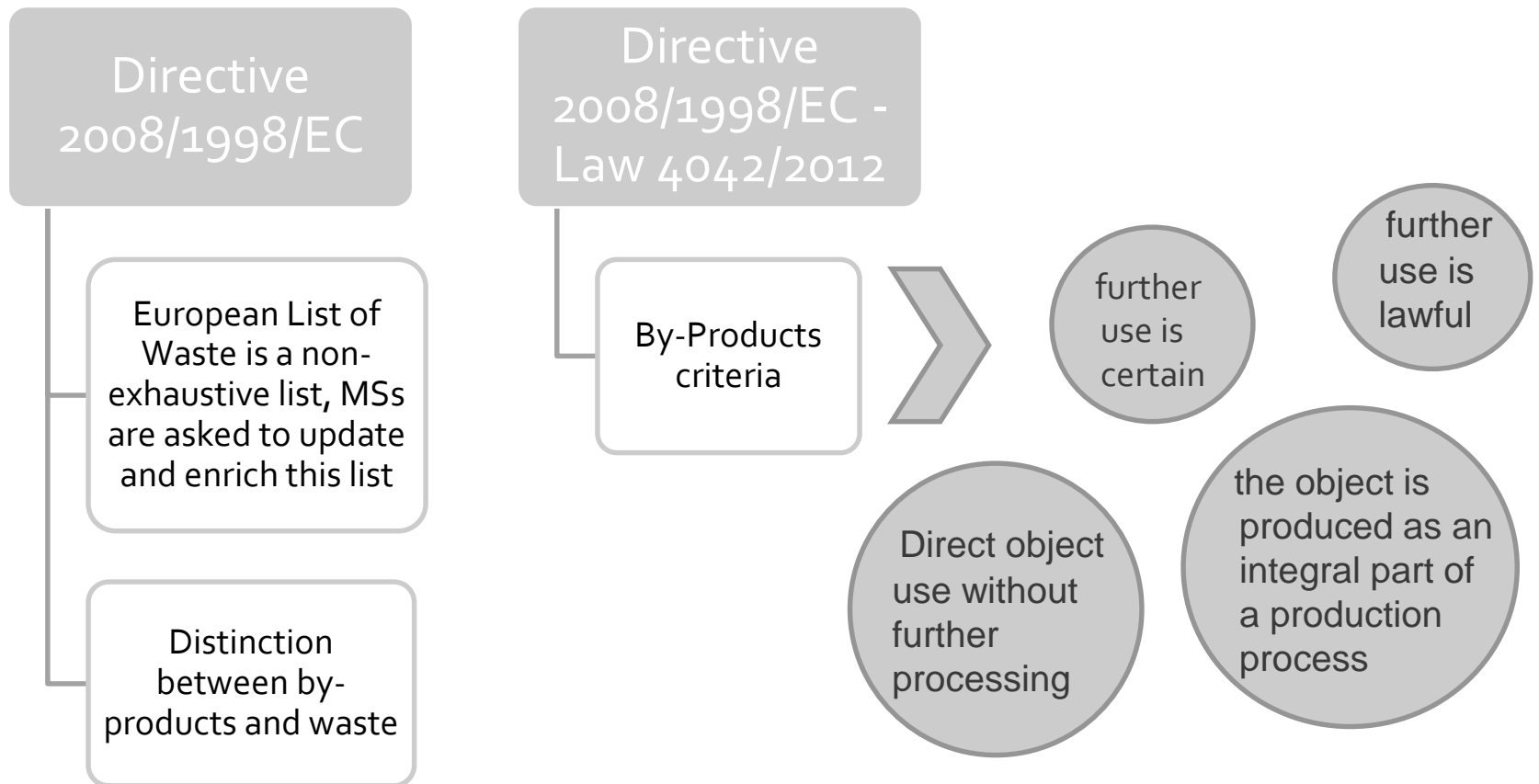
Imposition of sanctions

Law 4235/2014

Establishment of Livestock Zones



# List of Waste and By-Products



- *the European Commission has not yet made extensive research, classification and recording. Although, measures may be adopted to determine the criteria, to be met for specific substances or objects*



# End-of-Waste Criteria

Directive  
2008/1998/EC

Law 4042/2012

- End-of-Waste Criteria  
Specify provisions to  
declassify Waste

MSs can determine their own end-of-waste criteria given that no relative list have been adopted in EU level

1. *The substance or object is commonly used for specific purposes*

2. *A market or demand exists for such a substance or object*

3. *The substance or object should fulfil the technical requirements, meet the existing legislation and standards*

4. *The use of the substance or object will not lead to adverse environmental or human health impacts*

## Accomplished Technical studies and Adopted Regulations on EoW criteria

	Waste Stream	Technical Study EoW	Regulation
1	Category I.1: <b>Iron and Steel</b> Scrap	«End-of-waste Criteria for Iron and Steel Scrap: Technical Proposals» (2010)	EoW Regulation (333/2011)
2	Category I.1: <b>Aluminium</b> and Aluminium Alloy Scrap	«End-of-waste Criteria for Aluminium and Aluminium Alloy Scrap: Technical Proposals» (2010)	
3	Category I.1: <b>Copper</b> and Copper Alloy Scrap	«End-of-waste Criteria for Copper and Copper Alloy Scrap: Technical Proposals» (2011)	Commission Regulation on EoW for copper scrap (715/2013)
4	Category I.1: <b>Paper</b>	«End-of-waste Criteria for Waste Paper: Technical Proposals» (2011)	-
5	Category I.1: <b>Glass</b>	«End-of-waste Criteria for Glass Cullet: Technical Proposals» (2011)	Commission Regulation on EoW for glass cullet (1179/2012)
6	Category I.2: <b>Biodegradable waste</b> (compost/digestate)	«End-of-waste Criteria for Biodegradable waste (compost/digestate): Technical Proposals» (2014)	-

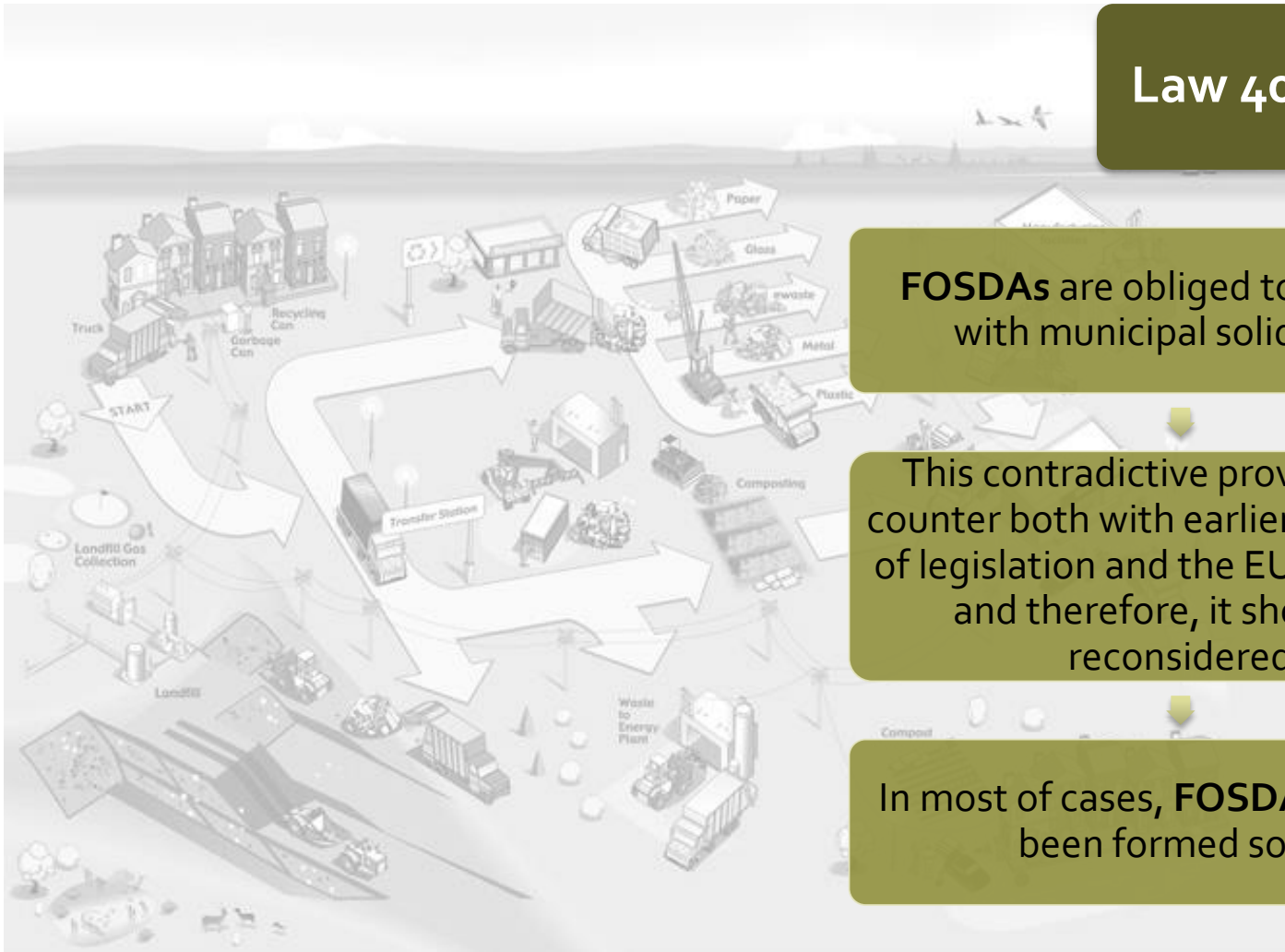
# Solid Waste Management Bodies

Law 4071/2012

**FOSDAs** are obliged to deal only with municipal solid waste

This contradictive provision runs counter both with earlier predictions of legislation and the EU Directives, and therefore, it should be reconsidered

In most of cases, **FOSDAs** have not been formed so far



# Air, Water and Solid Protection

EU	Greek		
Directive 2010/75/EC	JMD 36060/1155/2013	<b>Air protection</b>	configures a program for combustion and incineration plants in order to reduce combustion, incineration and co-incineration plants' emissions gradually
Directive 2006/60/EC (2008105/EC)	PD 51354/2641/2010	<b>Water protection</b>	measures needed for water protection and preservation
Directive 2006/118/EC	JMD 39626/2208/2009	<b>Water protection</b>	general provisions for groundwater protection
Directive 1991/676/EC	JMD 161690/1335/1997 & JMD 85167/820/2000	<b>Water protection</b>	for the nitrate pollution caused by agricultural activities
	JMD 145116/2011	<b>Water protection</b>	measures, conditions and procedures for the reuse of treated wastewater
COM (2006) 231	Draft Law	<b>Soil protection</b>	Industries are obliged to restore the polluted land

## ***EU and Greek Legislative Framework for Air, Water and Soil Protection***

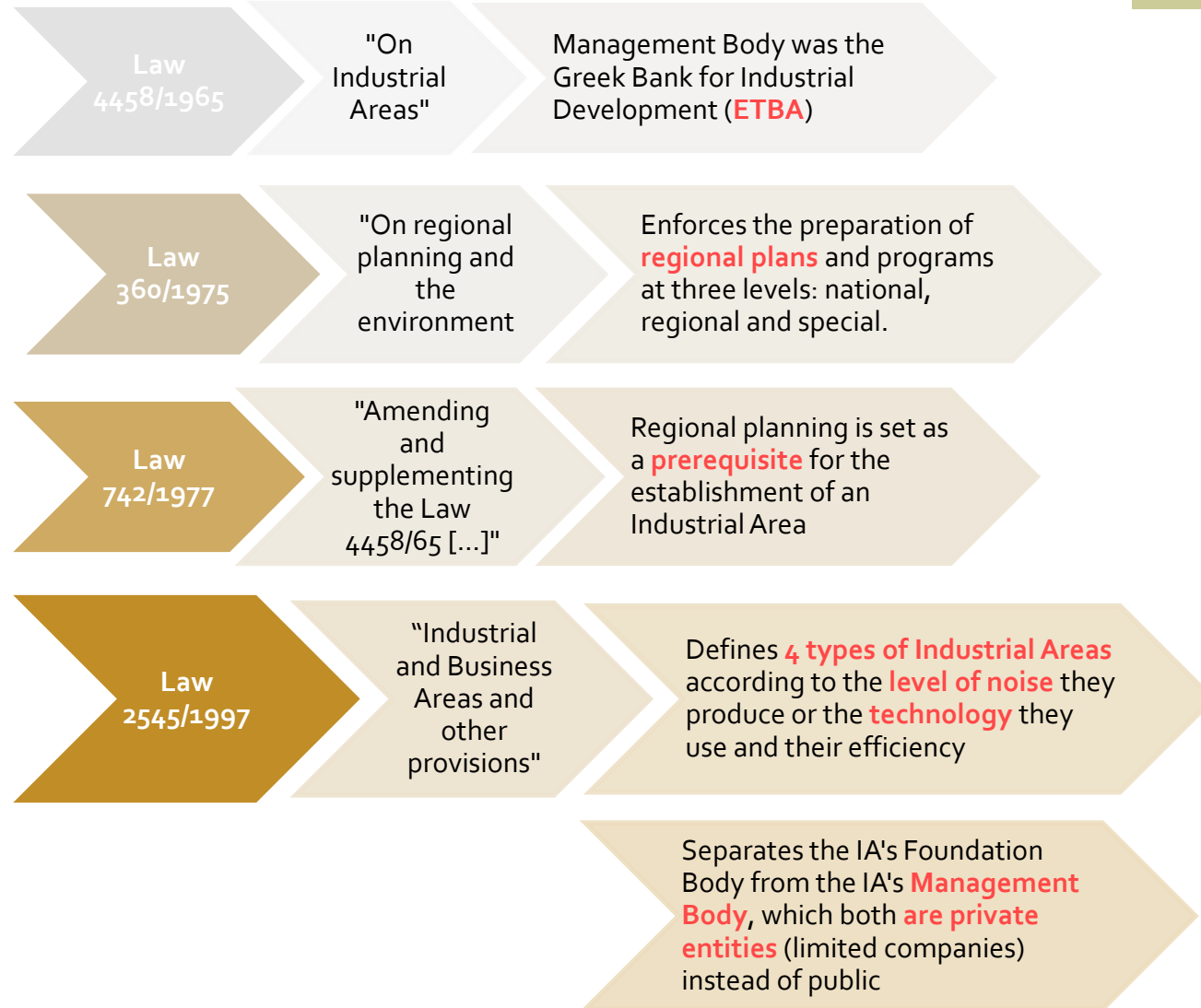
# Raw Materials and Energy Saving discussion

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## *It's worth mentioning that...*

- ✓ The 2002/32/EC '*European List of Waste*' should be updated.
- ✓ The *National Waste Management Plan* should be completed.
- ✓ Register and *Annual Reports of Waste Producers* Implementation.
- ✓ Mandatory reports of waste producers for *Agricultural Waste*.
- ✓ Criteria determination for *National End-of-Waste*, if needed.
- ✓ *List of potential uses* and industries that could be involved for each by-product category.
- ✓ Shared *Waste Management Networks*.
- ✓ Need for immediate *implementation of FOSDA* which will be responsible for all waste stream.

# Industrial Parks 1960-2000



# Industrial Parks 2009 - today

Special  
Framework for  
Regional Planning  
and Sustainable  
Development for  
Industry / 2009

- Notes the necessity to **deal with** widespread **Point Siting** of industrial units, particularly in outer ring areas.
- Advice **for incentive measures** for the **(re)installation** of industries at Ips.

Law  
3982/2011

- New Business Parks also include **areas of informal concentration of industrial activities** in order those to be rehabilitated.
- Provides **incentives** for individual industrial units to be established or relocated in Business Parks.

*"[...] A technical organisation study for the proposed site showing: aa)the layout of business activities in the business park, in the aim of grouping categories or types of activities, so that the development of one does not obstruct or hamper the development of the other and so as **to foster the creation of utilisation of common infrastructures and cooperation and networking between businesses.**" - **Law 3982/2011***

# (Re)location Incentives

Law  
3982/2011

Units exempt from **setup, donation and income taxes**

Units exempt from **permit requirements** for establishment activities

Units of low disturbance exempt from the obligation to get  
**Environmental Approval**

Units don't need **operation approval** if the Industrial Park do have one

Subsidized Program  
"Relocation of  
companies in  
Industrial Parks"

**Relocation** of manufacturing businesses

The new "National  
Strategic Reference  
Framework", Category:  
Environment "

Support innovation and entrepreneurship of products and services for environment upgrading by promoting "green business" and **Industrial Symbiosis**



# Industrial Parks discussion

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*It's worth mentioning that...*

- ✓ Industrial Park's *categorization* depends on the *level of disturbance* they cause.
- ✓ High *establishing cost* of an Industrial Park and *high land price*.
- ✓ The body tasked with establishing and running the Industrial Park is a *private entity*, not a *public* one.

Wabeerz  
Medawagte  
Merri  
unichleesh  
Tingki  
Komapsumnida  
Shukuria  
Paldies  
Mazur  
Tashakkur  
Makotai  
bolzin  
hai  
Sanco  
Maake  
Denkanja  
gozaimashita  
Fakaso  
Spasibo  
Ekhmet  
Mehrbani  
Nemachalhya  
Spasibo  
Bolika  
Yospageratam  
Mironochar  
Atto  
Gajitho  
Yaqhanyelay  
Efcharisto  
Dankscheen  
Arigato  
Merci  
Malteka  
ekojo  
Tredapuch  
suksama  
Sikoma  
Shukria  
Shukria  
Merastawby  
Chalha  
Biyangrazie  
Snauchalhya  
Juspaxar