Energy-from-Waste: The Big Picture

The Impact of Environmental Legislation on Technological Development and the Resulting Benefit for the Environment

Brussels, 11th of October 2010

Program

1. ESWET - Energy-from-Waste: The Big Picture
   a) Law + Technology = Better Environment *Evolution of pollutant emissions*
   b) Energy-from-Waste: Looking Ahead
      Evolution of waste management practices, energy efficiency, climate change
2. Friends of the Earth, UK: Friends of the Earth's View of Sustainable Waste Management
3. The Greens, DE: Saving Resources and Protecting Climate – Waste Policy Concept of Alliance 90 / The Greens in Germany
4. Discussion
5. Walking dinner

Our Workshop is a sustainable event in the frame of the Belgian Presidency of the Council of the European Union

It is organised in a sustainable way, yielding benefits for society, the environment and the economy

For instance, we ensure accessibility, offset carbon emissions, promote better mobility and reduce waste

For more information about the Belgian Presidency,

www.eutrio.be

European Union
Sustainable Energy Week
11-15 April 2011

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Sustainable Energy Europe

Energy-from-Waste:
The Big Picture

a) Law + Technology = Better Environment

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Trigger: Concern for air quality

- Starting in the 1980's, there is a strong political will to place more emphasis on environmental protection

- E.g. cleaning of flue gases from EfW

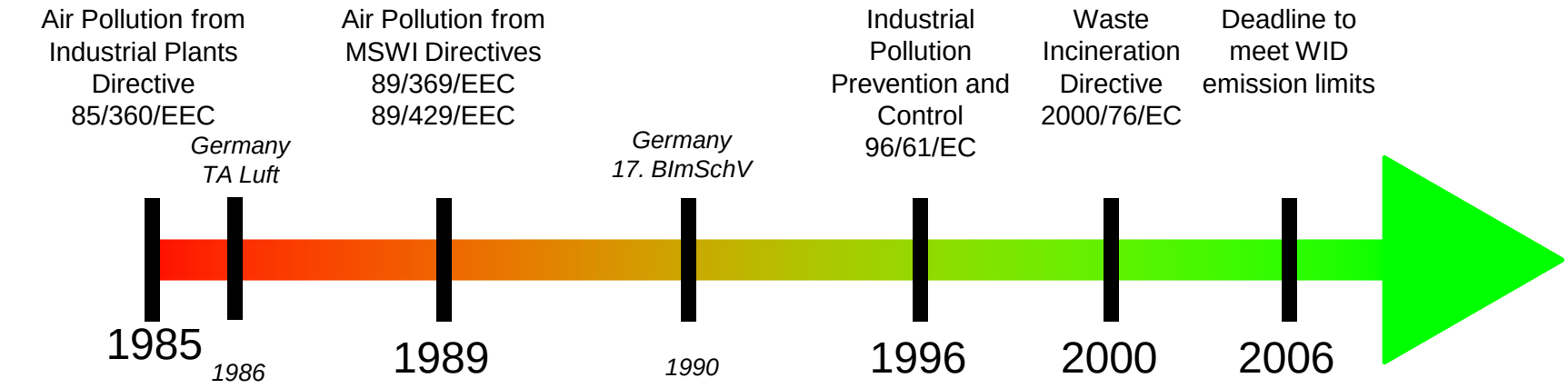
Result:

Legislators => Set emission limits based on Best Available Technology

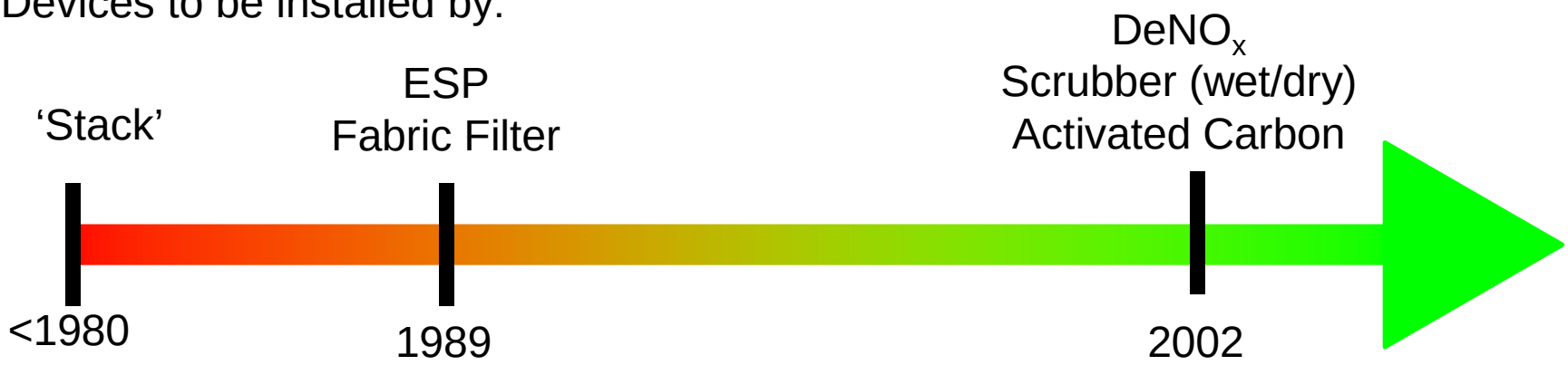
Suppliers => Develop and implement Best Available Technology for compliance

Actions: Legislation and technological developments

Legislation Enacted:



Devices to be installed by:



Where do we come from? Evolution of *air pollution control*

- 1980-1990
  - Pollutants to be regulated:
    - Dust, Heavy Metals, HCl, HF, SO_2, C_xH_y, CO
  - Legislative measures:
    - EU Directives on prevention/reduction of air pollution from new/existing waste incinerators (1989); German TA Luft (1986)
  - Technological response:
    - Cyclone, ESP, Fabric Filter, Combustion Control

Where do we come from? Evolution of *air pollution control*

- 1990-2000
  - Additional pollutants to be covered:
    - Dioxins, NO_x
  - Legislative measures
    - German 17. BImSchV (1990), EU Waste Incineration Directive 2000/76
  - Technological response
    - Scrubbers, Activated Carbon, $DeNO_x$ (SCR, SNCR)

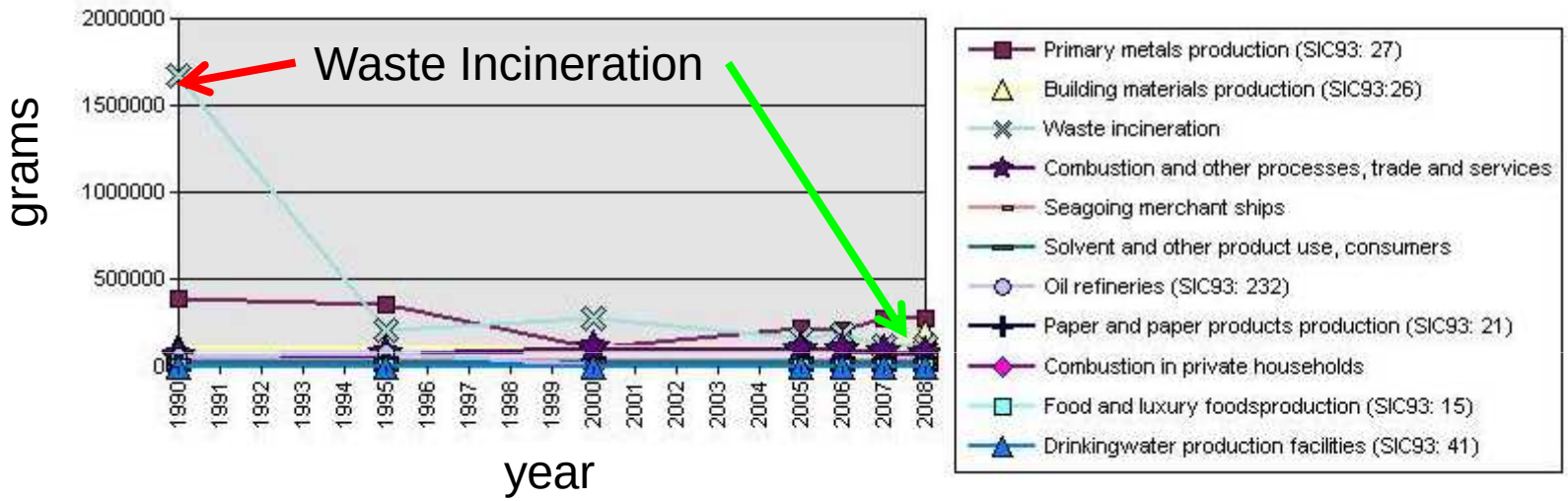
Is Energy-from-Waste's air pollution control efficient?

- 2000-today
  - Compliance with the EU Waste Incineration Directive (new plants end-2002, existing plants end-2005) was assured

Past: Lack of awareness and action against air pollution

Mercury Emissions, Netherlands

http://www.emissieregistratie.nl



1. In 1990, Waste Incineration is the largest source
2. In 2008, emissions are **15 times lower**
3. Yet some sectors increased their emissions in this period

Past: Lack of awareness and action against air pollution

Fluoride Emissions, Netherlands

http://www.emissieregistratie.nl

1

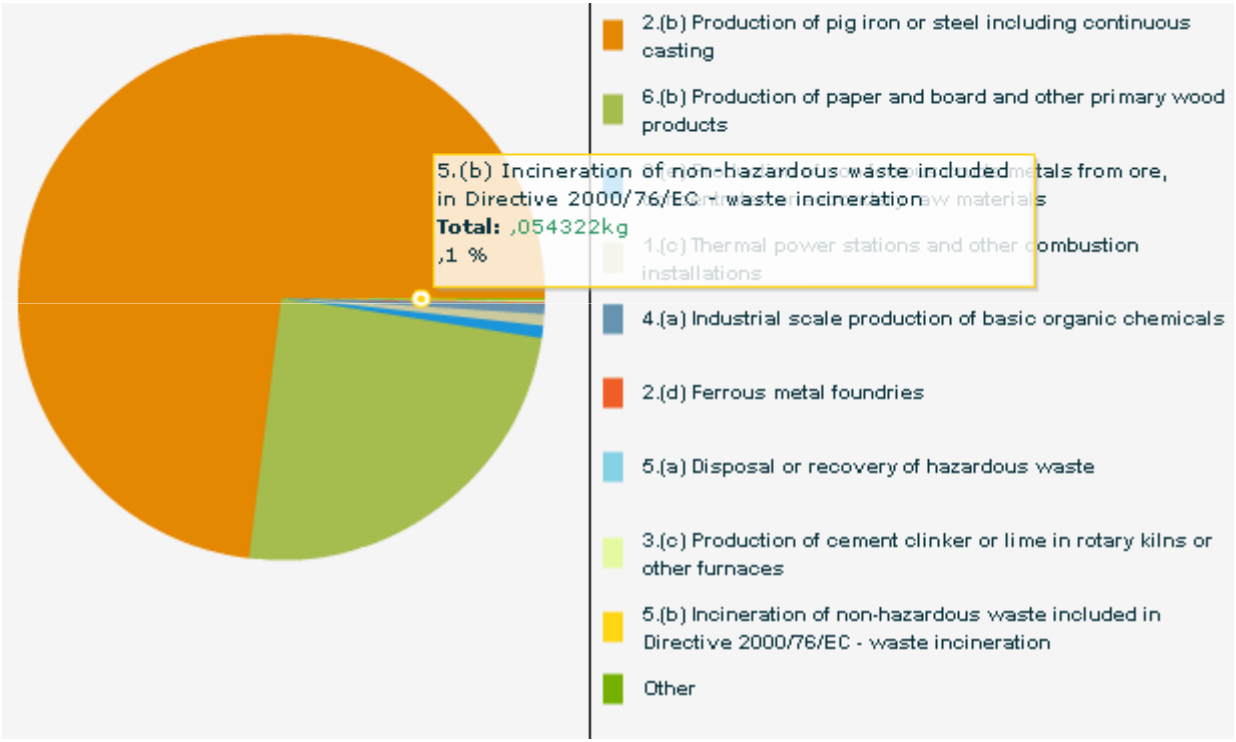
Subsector	199[illegible]	1995	2000	2005	2006	2007	2008
Building materials production (SIC93:26)	855900	554000	436500	384500	381700	377900	384200
Primary metals production (SIC93: 27)	400000	278900	314500	285600	244100	256300	255800
Chemical industries (SIC93: 241 excl. 2415)	133300	32420	46300	2	26550	25340	25160
Metallic and electrotechnical products (SIC93: 28-35)	48140	3487	14		3735	13360	13360
Chemical industries other (SIC93: 243 - 247)	451	4710	[illegible]	[illegible]	[illegible]	3860	3694
Chemical industry ammonia and fertilizers (SIC93: 2415)	32220	16220	3409	1621	1326	2454	[illegible]54
Waste incineration	41960	3206	2631	1637	2854	1197	1197
Chemical industries agricultural pesticides (SIC93: 242)			168	58	54	80	78
Combustion in private households	29	10	8	9	8	8	9
Combustion and other processes, trade and services	54310	25480	2681	0	0	1	1

3

1. Emissions from Building Materials Production **2 times lower**
2. Emissions from Waste Incineration **35 times lower**
3. Today, Building Materials Production emits **320** times more Fluoride than Waste Incineration

Today: Air pollution control for EfW is efficient

Dioxin Emissions from Industries in the EU-27, data from 2007



Screenshot from the E-PRTR, European Pollutants Release and Transfer Register
http://prtr.ec.europa.eu/PollutantReleases.aspx

Today: Air pollution control for EfW is efficient

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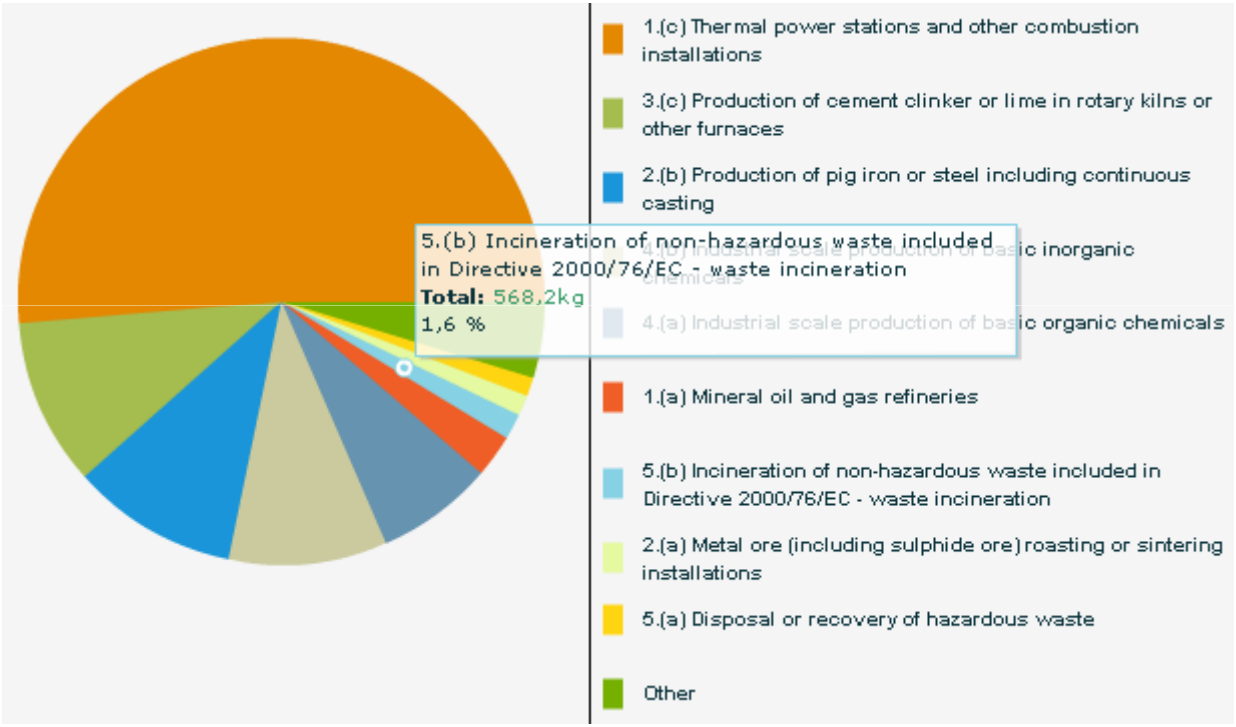

Screenshot from the E-PRTR, European Pollutants Release and Transfer Register
http://prtr.ec.europa.eu/PollutantReleases.aspx

Today: Air pollution control

- Waste Incineration Directive mandates the strictest Emission Limit Values for EfW compared to any other industry
- EfW safely complies with (and often surpasses) all EU standards for pollutant emissions
- EU standards for EfW are copied worldwide as the best environmental protection standards

Looking ahead: Air pollution control

- To reduce ground and water pollution: <u>less landfilling</u>
  - More benefit for the environment if landfilling is stopped rather than restricting the use of bottom ash as construction material
- To reduce air pollution: <u>bring all industries to EfW emission standards</u>
  - More benefit for the environment if other IPPC industries are brought to the same emission levels as EfW than to further reduce ELV's for incineration

Energy-from-Waste: The Big Picture

b) Energy-from-Waste: Looking Ahead

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Today: The Big Picture

Energy-from-Waste has fulfilled its potential for environmental protection in the EU at an acceptable cost for society...

- *in terms of Air Pollution* *(+throughout)*
- *in terms of Waste Management* *(±in some countries)*
- *in terms of Energy and Climate* *(±in some countries)*

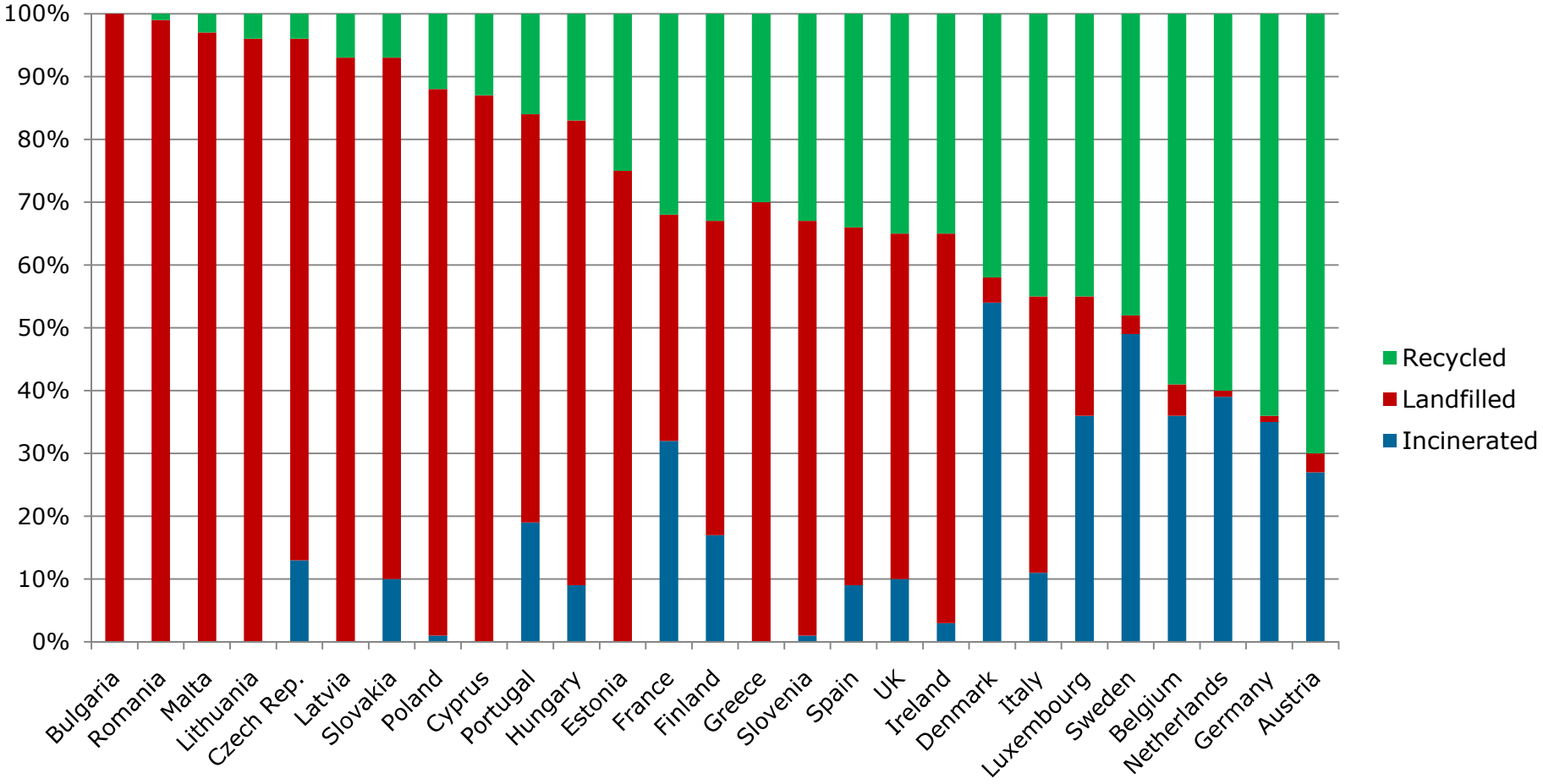
Why?

+Strong will to have clean "incinerators"

±Willingness to manage waste in the best manner varies

±Concern for Climate Change and Energy Demand / Availability varies

Today: The Big Picture



Eurostat, 2008

Why does such a difference persist?

Looking ahead: Air pollution control

- As shown previously, EfW already meets the challenge and is no longer a significant contributor to air pollution

Today: Waste management

- Landfill Directive and Waste Framework Directive are not applied everywhere
- Consequence:
  - Some EU Member States implemented the best Waste Management Policies in the world
  - Others are far from it……

…Is there a problem with the legislative framework or simply a lack of will to implement it?

Looking ahead: Waste management

- EU must go from a *landfilling* to a *recycling (+recovery)* society
- Energy-from-Waste is the only alternative to landfilling for unrecyclable waste
- Extending lifetimes for landfills delays the problem
- Zero-Waste is an ambitious goal, but interim solution is either Landfilling or Energy Recovery **Make your choice**

Looking ahead: Waste management

- EU law says: recyclable waste must be recycled, not incinerated
- EU law says: waste should not go to landfill
- Bottom line: unrecyclable waste should be incinerated, not landfilled

- Bio-Waste is a special case. Since it is not worth transporting, a different assessment is required
  - Best options for Bio-Waste: Composting, Anaerobic Digestion or Energy-from-Waste
  - Best option at local level: depends

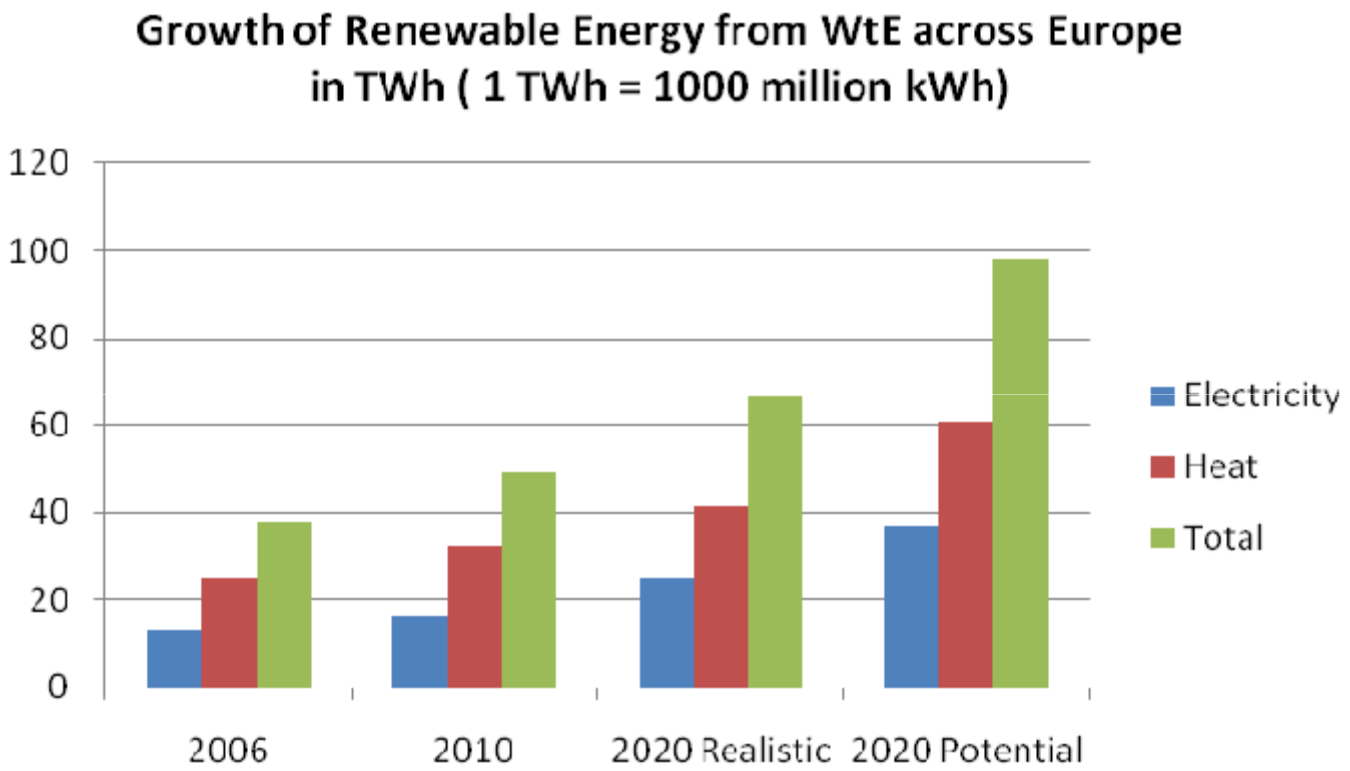
Today: Energy and Climate

- Only now do we get energy efficiency standards for EfW. Some existing plants were designed for high energy efficiency, others not
- EfW plants already help fighting Climate Change

Looking ahead: Energy and Climate

- New EfW plants projects are designed to meet R1
- Bigger consideration than ever using heat + electricity (CHP)
- R1 drives investment into more energy efficiency, something energy prices/subsidies had done only in some countries

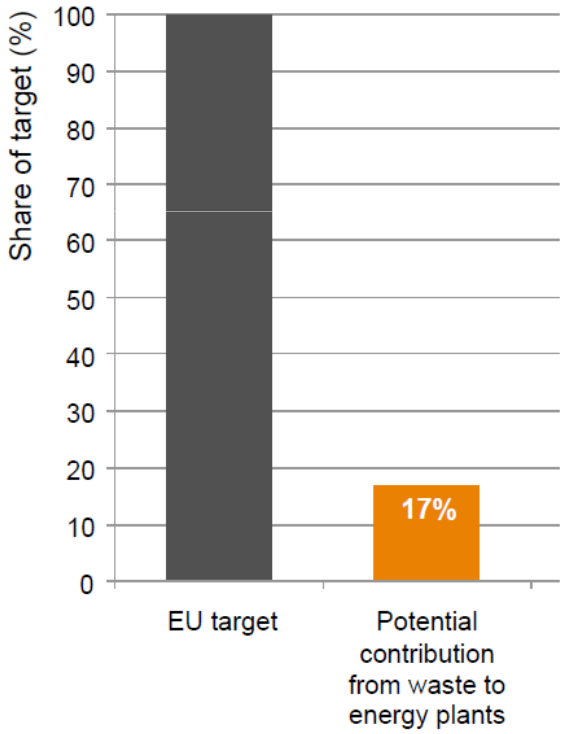
Looking ahead: Energy and Climate



Source: CEWEP 2010

Looking ahead: Energy and Climate

Potential contribution from waste to energy plants to EU:s target to increase the use of renewable energy.



EU target:
Increase the share of renewable energy in final energy consumption to 20% by 2020 compared to the consumption 2005.
(Directive 2009/28/EC)

Source: Profu 2010

Looking ahead: Renewable Energy

- Waste taken away from landfill (for recycling or energy recovery) helps fighting Climate Change
- Thermally recovered unrecyclable biogenic fraction of waste is a renewable energy
- We need EU-wide recognition, based on % of biogenic waste
- Level Playing Field in Renewable Energy incentives / support would help

Looking ahead: Alternative Energy

- Unrecyclable fossil waste is an alternative energy. Still, it emits fossil CO_2 when incinerated
- Nevertheless, EfW should stay out of EU ETS:
  - Residual waste is generated by citizens; the Energy-from-Waste actors cannot influence waste arising
  - More waste unavoidably means more CO_2, no matter the financial or bureaucratic incentive/hindrance
  - If a carbon tax or carbon allowances cover EfW:
    - EfW must incinerate less, as this is the only way of reducing CO_2 emissions from thermal treatment...
    - ...and so the remaining waste will end up in landfills. Is contaminating soil and water better than reducing GHG?
  - Solution: Reducing waste production = CO_2 Reduction
    Taxing emissions from WtE ≠ CO_2 Reduction

Thank you for your attention!