

6<sup>th</sup> CEWEP Congress 2012

**Waste-to-Energy**

▶ **Energy & Resource Efficiency**

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# Energy Supply from Waste-to-Energy in the future and The impact of the EU Energy Efficiency Directive

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# Agenda

1. Global Development
2. Waste Management
3. European Energy Efficiency Directive
4. Vision



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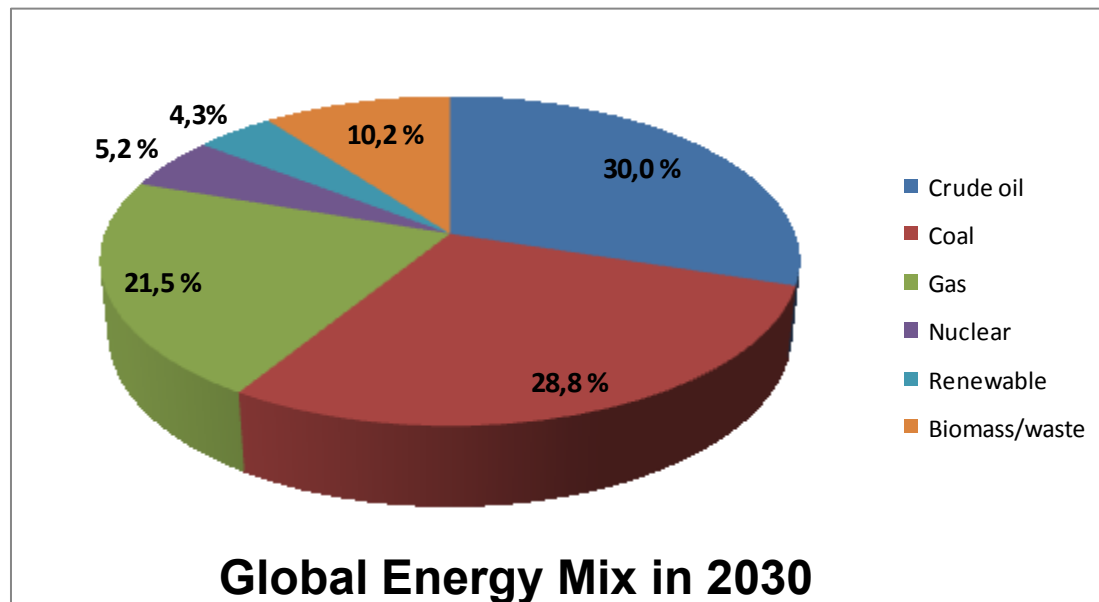
## Growth of Global Population and Hunger for Energy

- World 2012: More than 7.05 billion people
- Leader: China and India
- Rapid growth of megacities
- Forecast 2030: 8.6 billion people
- More people = higher energy demand
- The availability of energy is the prerequisite for growth and prosperity
- Energy availability splits world into:
  - Industrial nations
  - Growth regions
  - Developing countries



## Global Energy Mix in 2030

- Total energy demand will increase by 45 percent by 2030
- 2030: 80 percent of global energy comes from fossil fuels



### Development 2010 vs. 2030:

Crude Oil:	- 4,3	percent
Coal:	+ 2,6	percent
Gas:	+ 1,0	percent
Renewable:	+ 1,6	percent
Bio./Waste:	+ 1,5	percent
Nuclear:	- 1,3	percent

## Consequences of the Growth in Population

- Global population growth, prosperity and energy requirements result in over proportional production of waste
- 7.0 billion people = 14 to 15 billion tonnes of waste  
> and increasing all the time
- The more economically developed a country is, the greater the volume of waste

➤➤➤ **Part of the global solution: thermal waste treatment**



# Global Waste Development versus Wealth

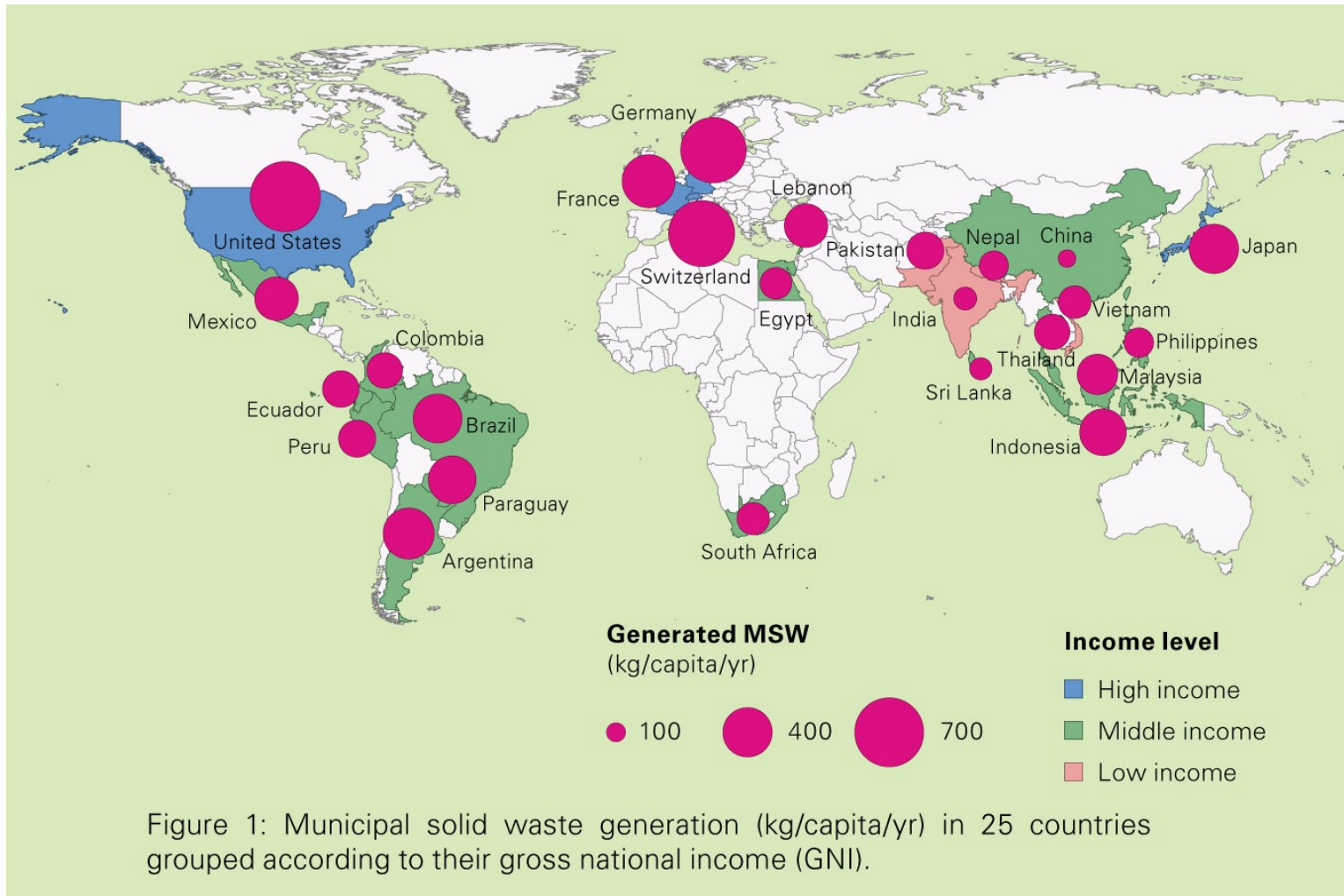


Figure 1: Municipal solid waste generation (kg/capita/yr) in 25 countries grouped according to their gross national income (GNI).

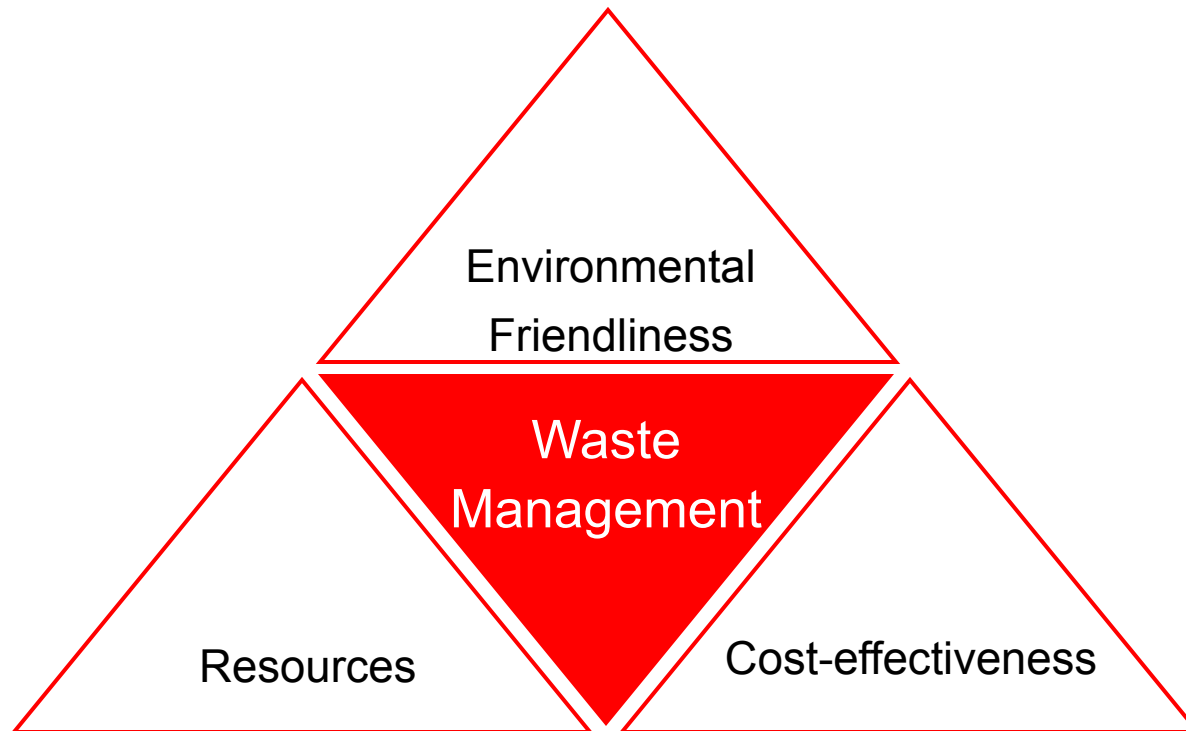
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# Waste Management Target Triangle

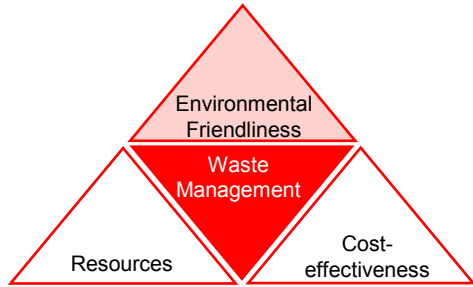


## Environmental Friendliness

- Environmentally-friendly waste disposal:
  - undisputed overriding goal
- Politicians set objectives for
  - acceptable contamination of the soil, water, air
  - recycling quotas

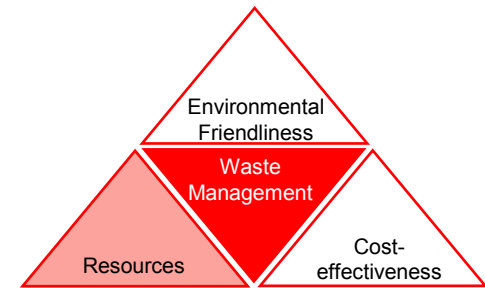
but do not: define the ways of achieving them

➤➤➤ **Waste incineration fulfils the objectives**

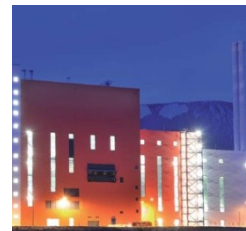
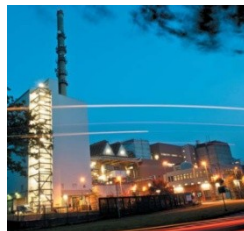


## Resources

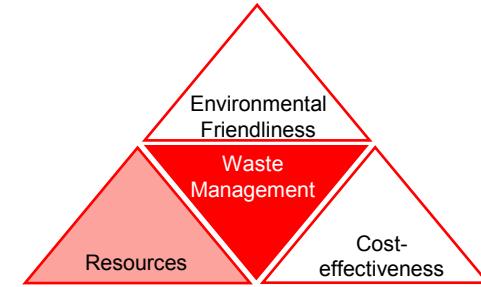
- Protection fossil resources (gas, coal and crude oil) for the production of energy
- An overall view is required
- Protecting the environment takes precedence over protecting resources
- Waste incineration and raw material recycling: complementary mainstays of waste management



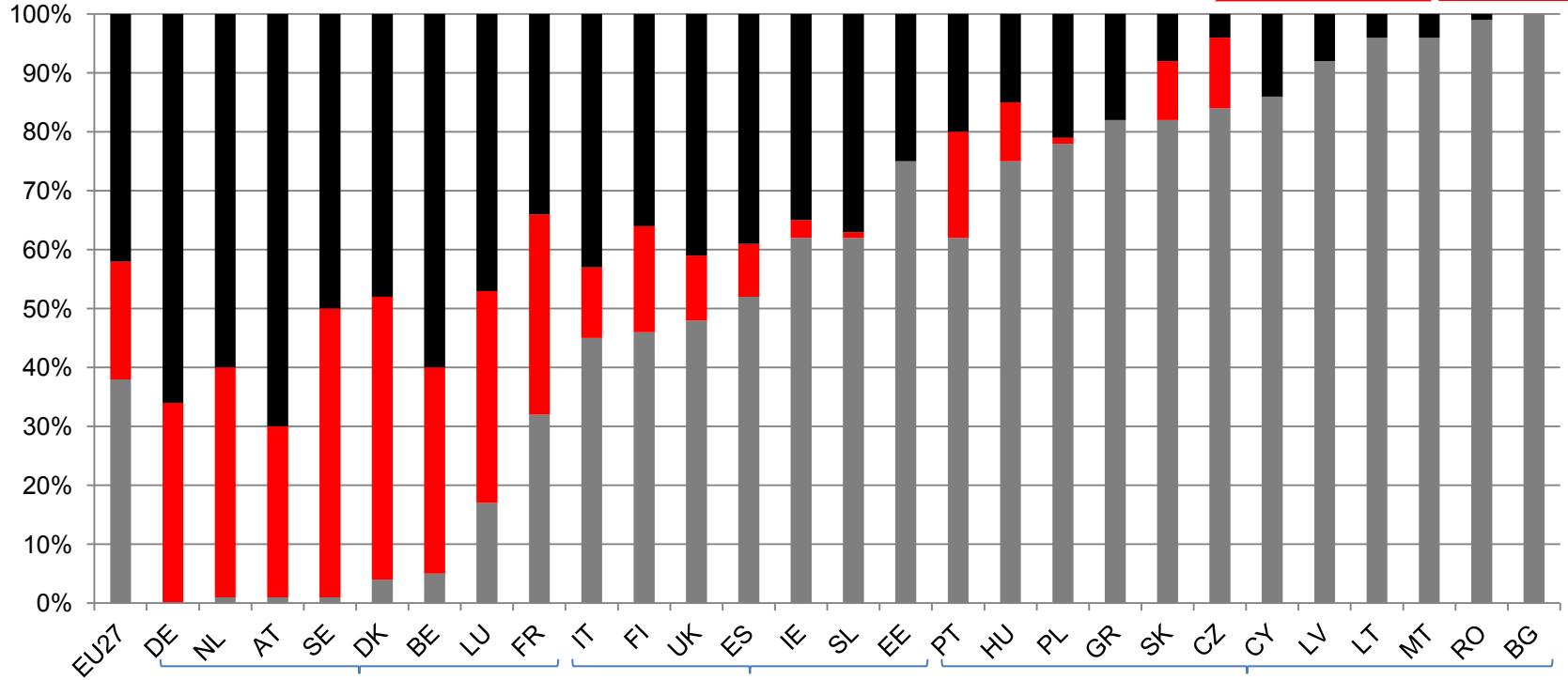
➤➤➤ **Waste incineration protects resources**



# Clean Coexistence



Treatment of municipal waste in the EU (2009)



Source: EUROSTAT

**Group 1**

Waste incineration > 25 %  
Recycling > 25 %

**Group 2**

Waste incineration < 25 %  
Recycling > 25 %

**Group 3**

Waste incineration < 25 %  
Recycling < 25 %

■ Waste incineration   ■ Recycling   ■ Dumping



## Cost-effectiveness

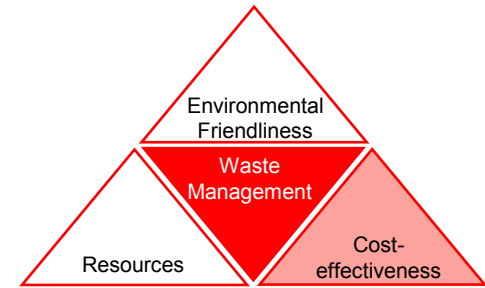
Dependent on the development of ...

...Quantity and energy prices

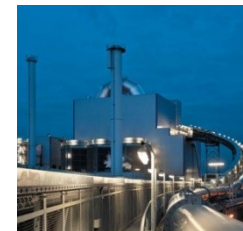
...Costs

...Technology

...Reliability

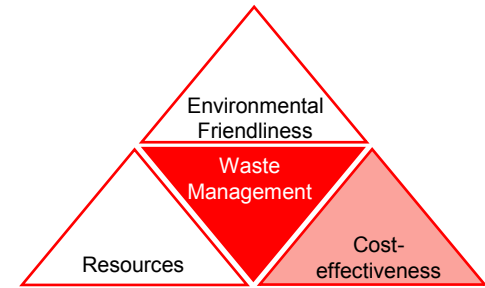


➤➤➤ Waste incineration fulfils the prerequisite of cost-efficiency



# Decentralised Energy Production

Energy from waste is



- Capable of basic load operation
- Adaptable to specific (industrial) customer requirements
- Reliable in terms of supply assurance and price development
- Predominantly CO<sub>2</sub>-neutral
- Energy output of more than 600 kilowatt hours for 1 tonne of waste



## Energy Yield in 2010

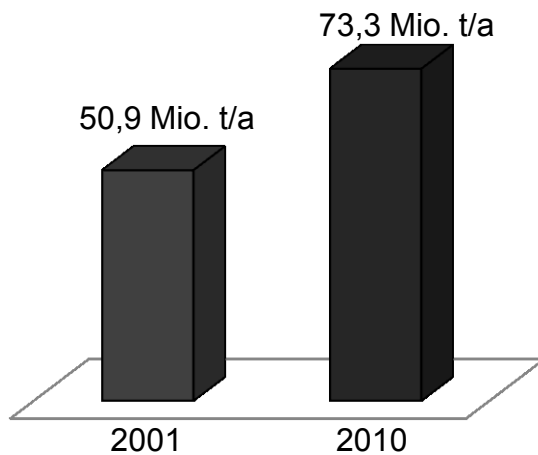
- Throughout Europe 450 thermal waste treatment plants
- Incinerate 73 million tonnes of waste
- Producing 31,200 GWh of electricity
- Supplying 60,900 GWh of heat
- Increasing approximately 40 percent over a period of 10 years (2001- 2010)

Source: CEWEP

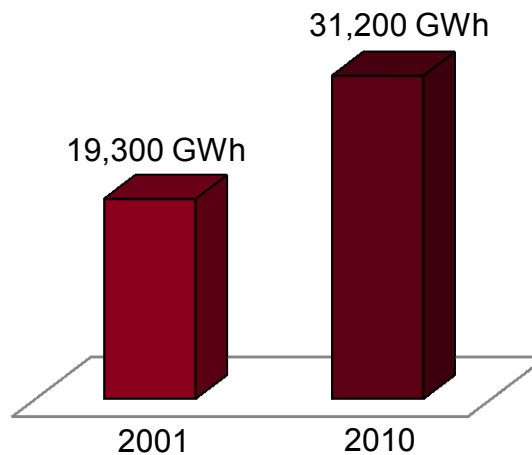
➤➤➤➤ The result is good, but we can do better !!



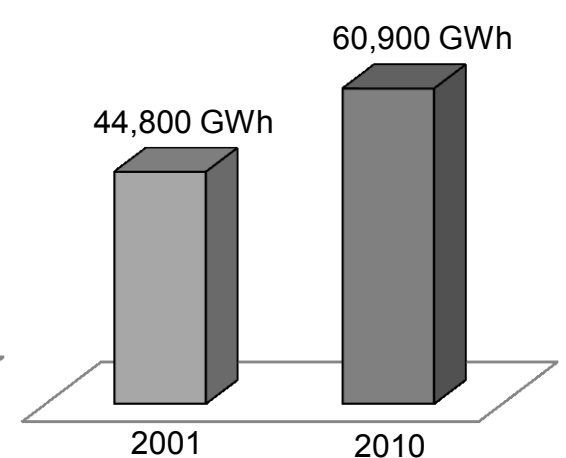
## Development in 29 European States



Quantity of waste



Electricity production



Heat supply

Source: CEWEP



## Example: E.ON Energy from Waste Power Plant in Delfzijl/Netherlands



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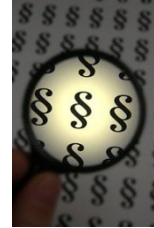
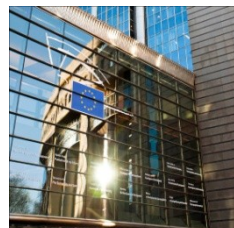




## Europe 2020: Targets

- Europe-wide energy savings of more than 20 percent in terms of primary energy (oil, gas, coal) by 2020
- Savings potential through the supply of:
  - Public and privately-owned buildings
  - Industrial plants
- Increase use of district heating/cooling as a supply alternative to primary energy
- Increase the combination of electricity and heat production

➤➤➤➤ New Energy Efficiency Directive of the European Parliament





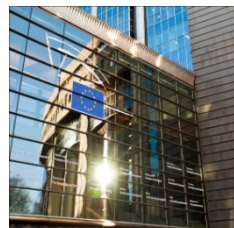
## Thesis

We welcome the introduction of the energy efficiency directive

➤➤➤ This directive will provide the right incentives

but

➤➤➤ could have even more effects on thermal waste treatment

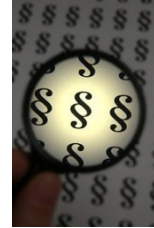
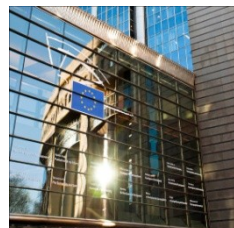




## Input of Thermal Waste Treatment

- Increase in the degree of energy efficiency
- Savings potential in requirements for primary energy in power plants
- The relative share of thermal waste treatment in the general energy supply will grow

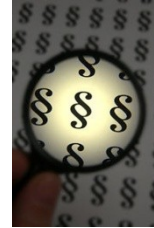
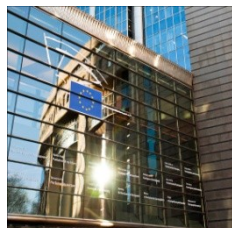
➤➤➤ Thermal waste treatment protects primary energy!





## Improvement Opportunities

- Precedence for district heating supply
- Consideration of country-specific differences in the EU in terms of:
  - Waste Management Industry
  - Numbers of thermal waste treatment plants
  - Use of district heating/process steam
- Cost-effectiveness and state funding



## Example – Interargem, Bielefeld/Germany



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## Vision

Through the generation of energy from waste incineration as a form of renewable energy we are making an important contribution to a sustainable and environmentally-friendly energy mix in the 21<sup>st</sup> century. Waste recovery is guaranteed.

In this way we can counter the pollution of our planet.

With every item of waste that is not utilised energy efficiently, primary energy is squandered.