

Part 1 - More Energy from Waste - District Heating in Denmark

Bettina Kamuk
project Director, EFW
Rambøll Denmark

bkc@ramboll.dk
www.ramboll.dk/wte



- Leading energy-from-waste consultant in Europe
- Long track record of energy-from-waste plant projects. Ongoing projects at > 25 EFW plants
- Independent consulting services
- >50 specialists within EFW



Energy-from-Waste plant references - Rambøll

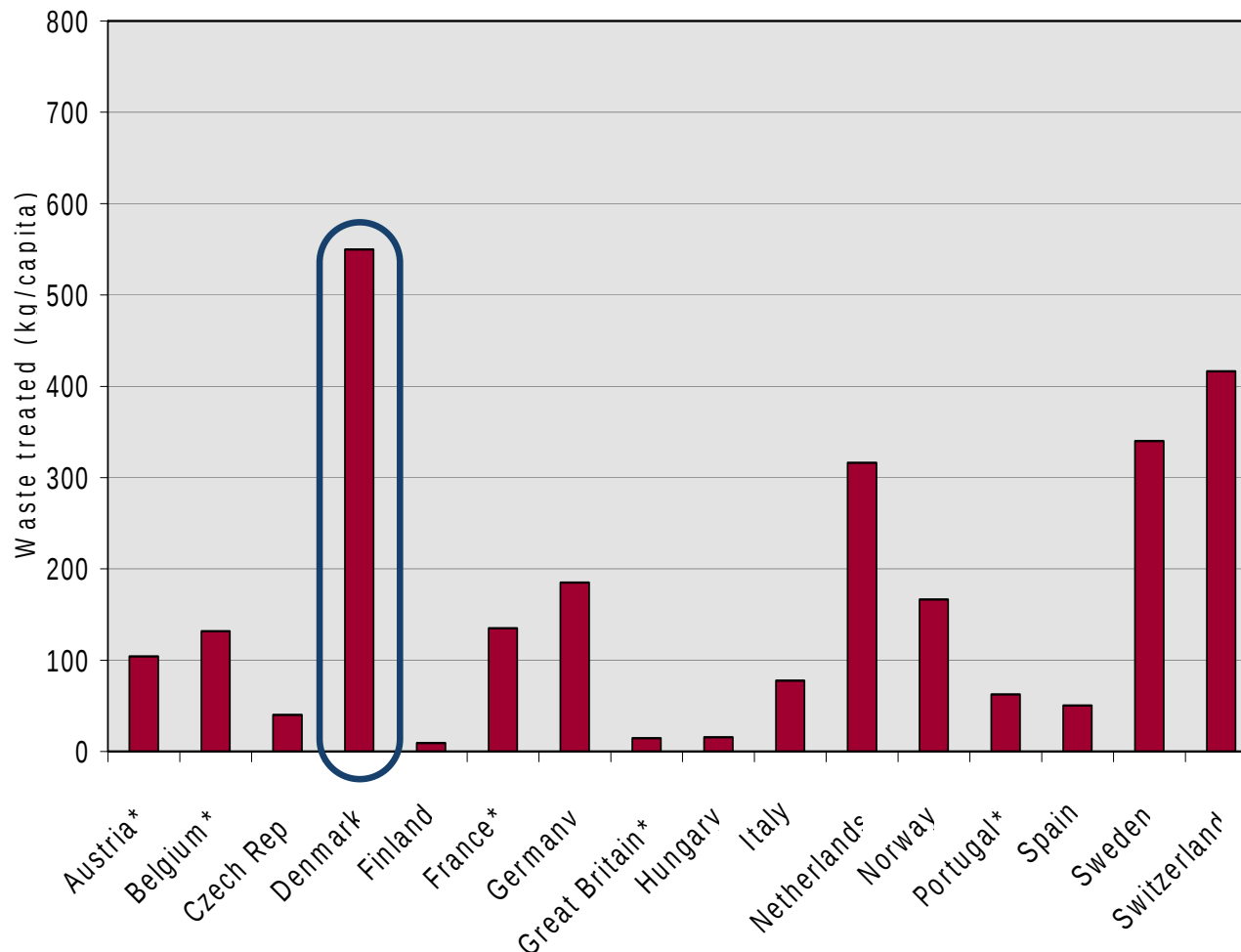


Legislative framework

1. **Flow control**
2. The **Waste hierarchy** is applied
3. **Landfill ban** on combustible waste since 1997
4. Integrated **national energy policy** aiming at decreasing the reliance upon fossil fuels and reducing greenhouse effect.
5. EFW is in Denmark supported by **fiscal and legislative measures** that include: i) power generation incentives, ii) higher tax on landfill than EFW, iii) priorities district heating from EFW over other energy sources



Average EFW treatment per capita 2004



Waste-to-Energy Plants in Europe, 2003
Treated Waste in million t/year (2003)

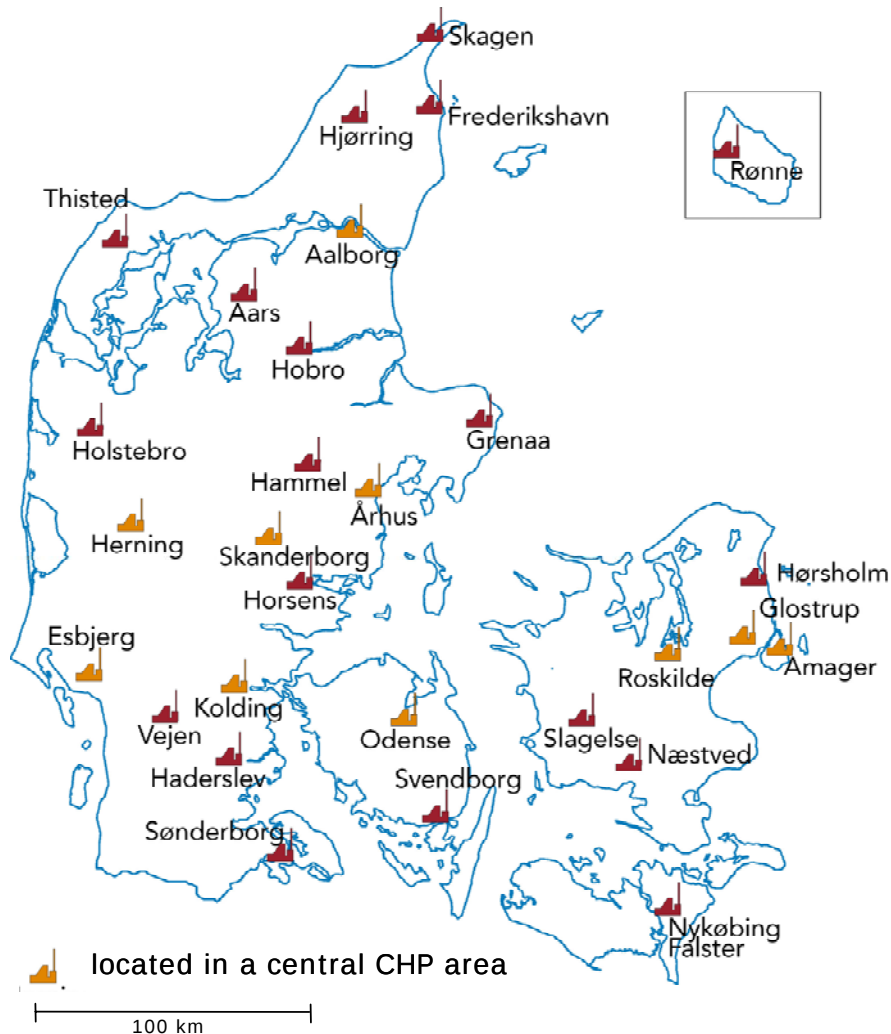


Source: Energy from Waste. State-of-the-Art Report. Statistics 5th Edition August 2006. **ISWA** Working Group on Thermal Treatment of Waste and **CEWEP**.

EFW and District Heating



Energy recovery from EFW in Denmark



3.3 million tonnes of waste incinerated

Electricity	1.5 million MWh	430,000 households
Heat	6.5 million MWh	360,000 households

18 % of all energy for district heating derives from EFW

How to use Energy from EFW in Copenhagen ?



How to use energy from waste in Copenhagen ?



How to use energy from waste in Copenhagen ?



How to use energy from waste in Copenhagen ?



HP station

energy plant

plant

in pipeline

How to use energy from waste in Copenhagen ?



HP station

energy plant
n
plant
on pipeline

How to use energy from waste in Copenhagen ?



HP station

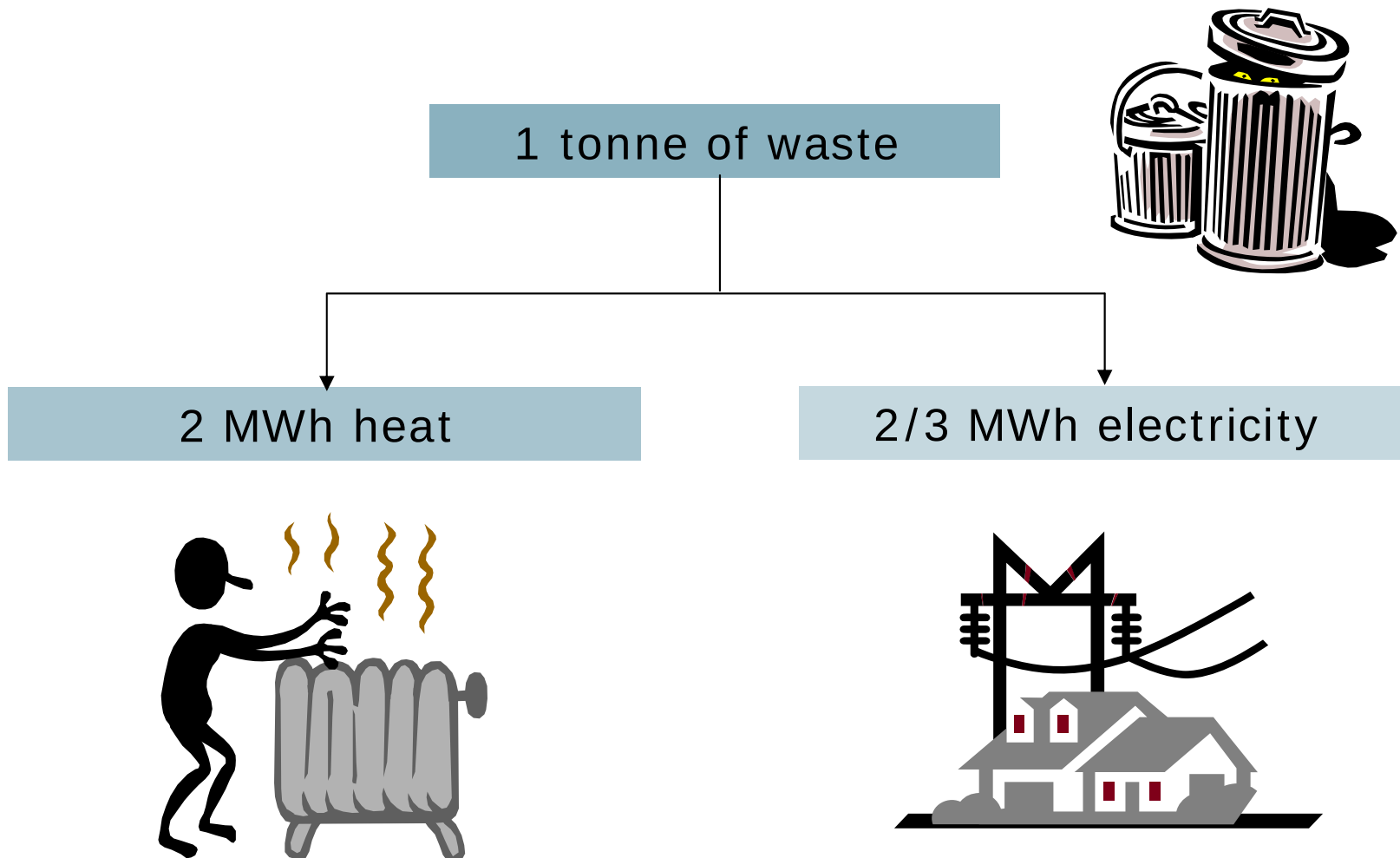
ing

energy plant
n
plant
on pipeline

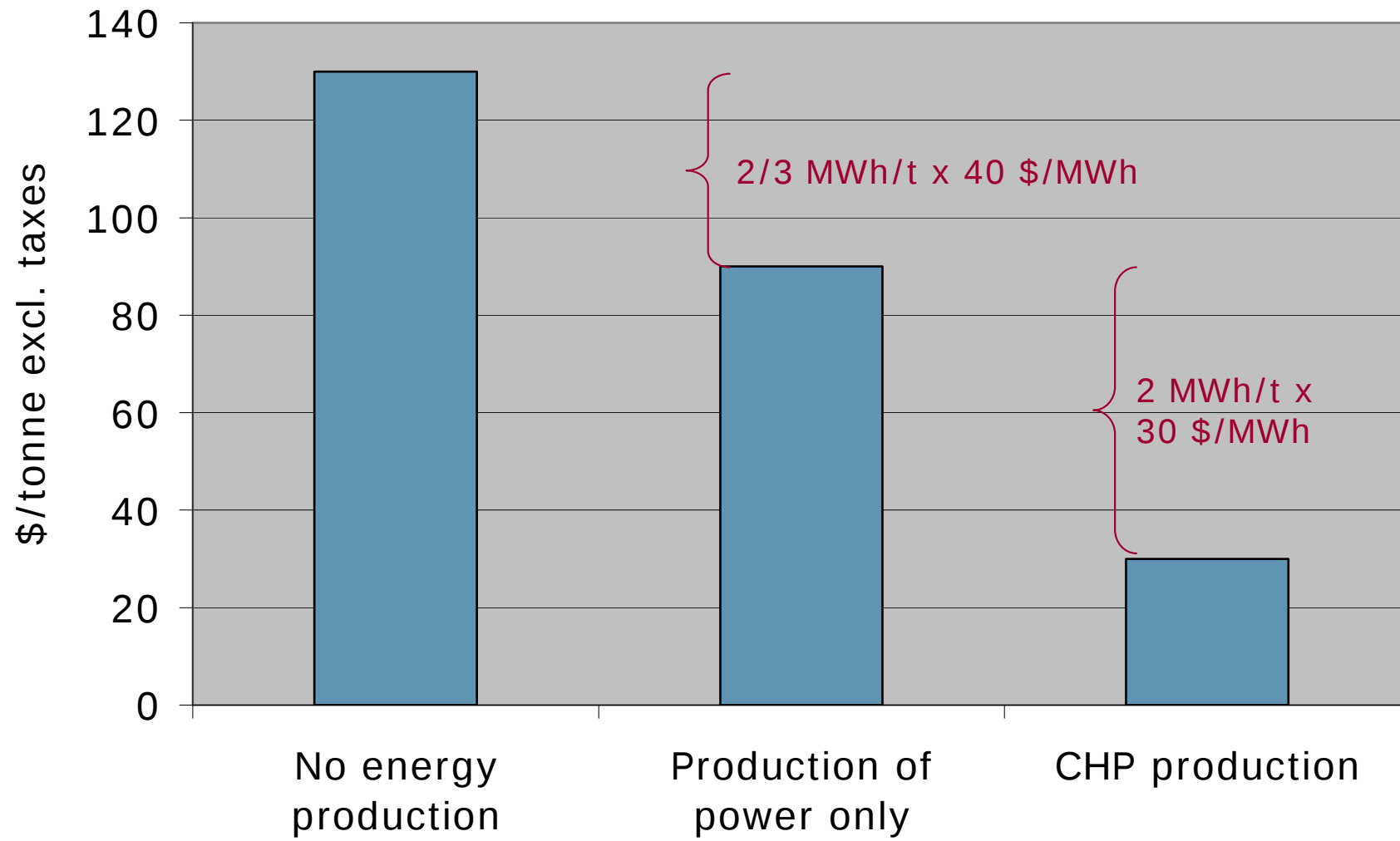
Various Energy Ressources - Copenhagen



Energy recovery from waste



The impact of energy production on gate fees

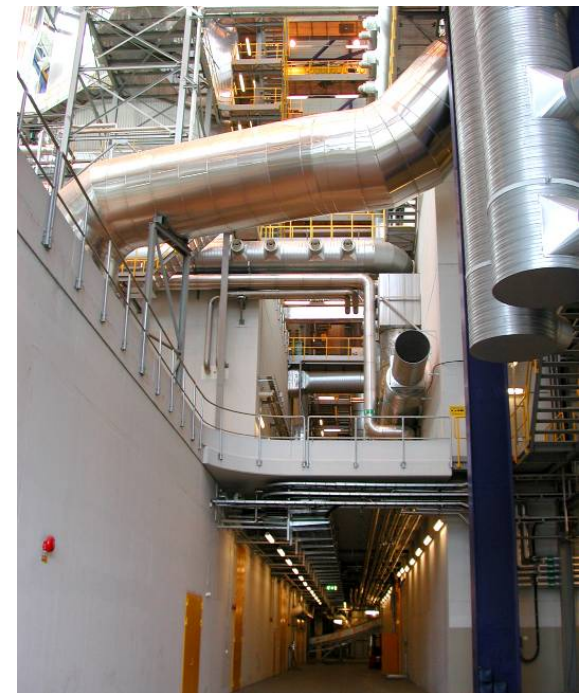


Costs

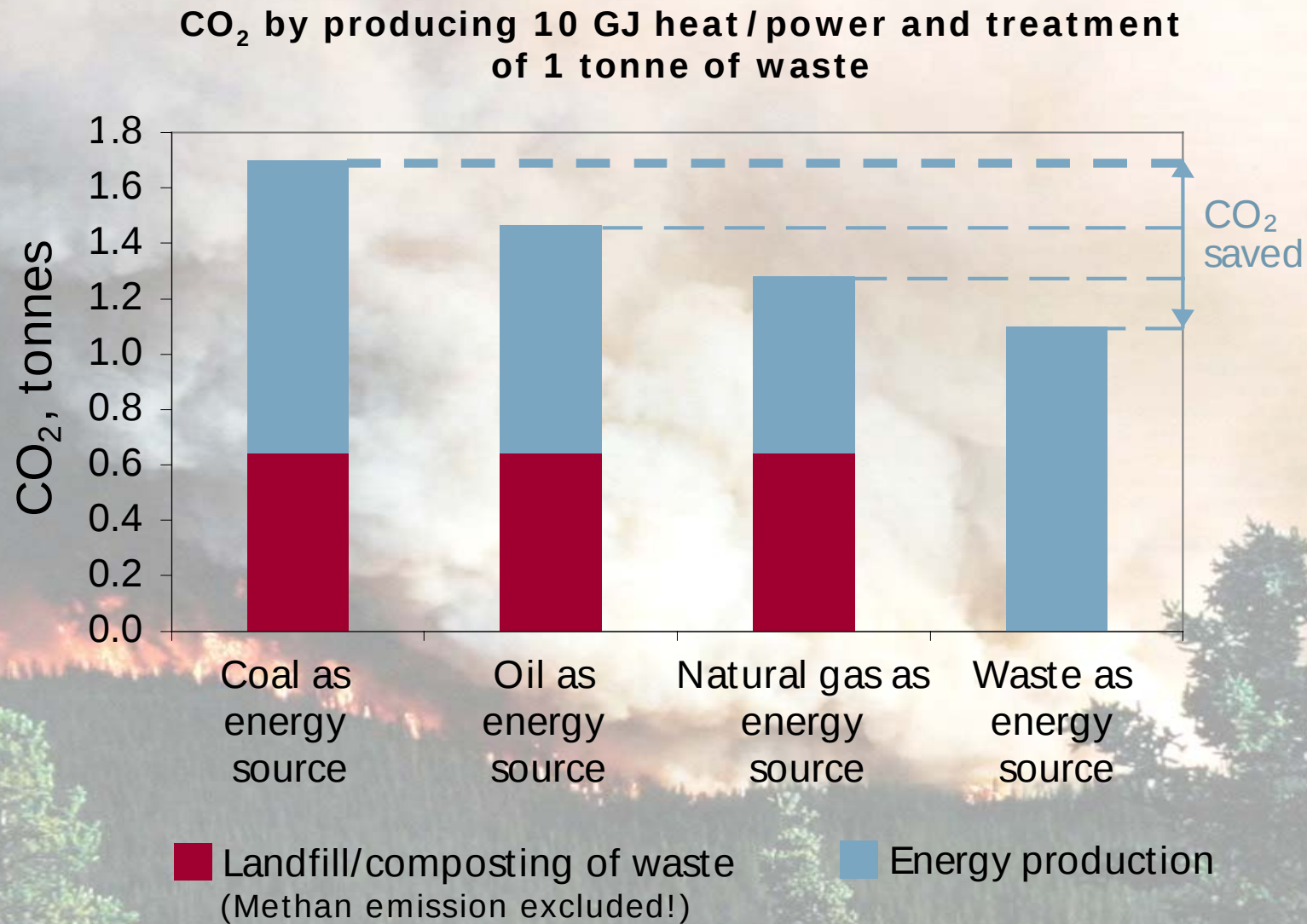
EFW costs are the same in Denmark as the price of an empty rubbish sack



i.e. about \$ 0.40 a week per household!



Climate Change: Saved CO₂ emissions



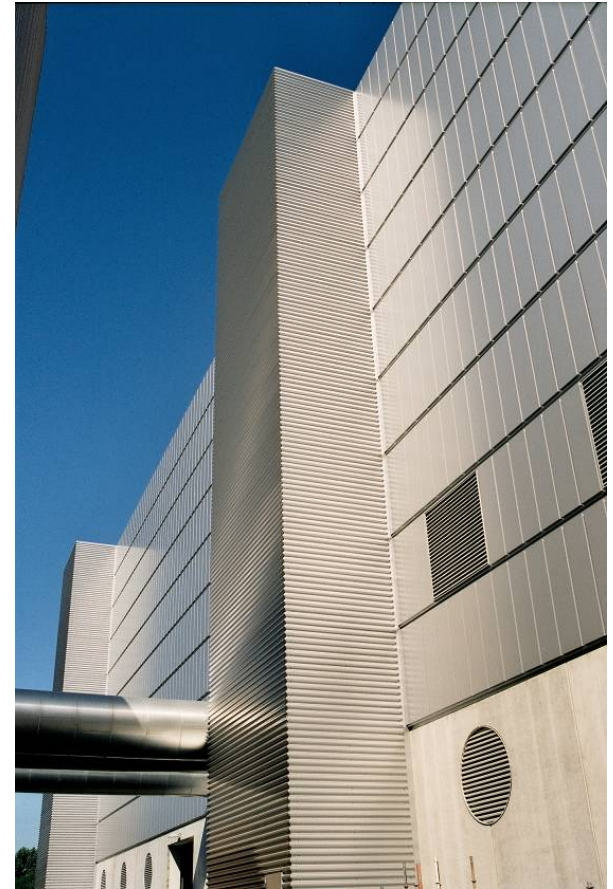
Architecture



Hørsholm, Denmark



Roskilde, Denmark

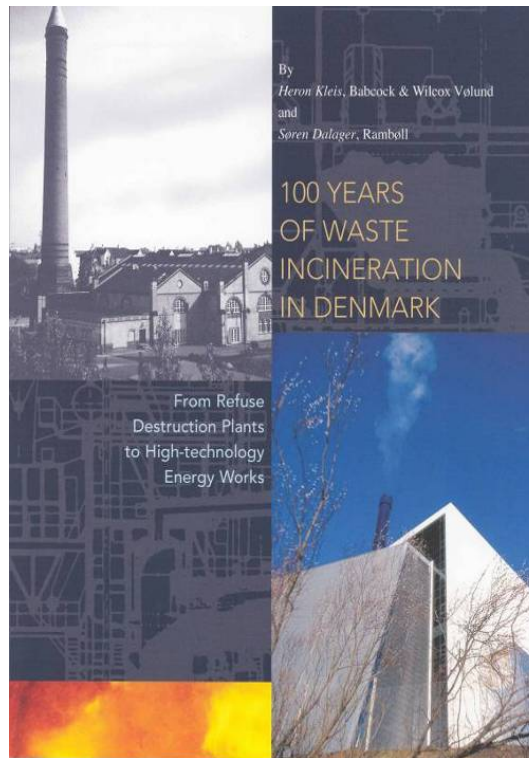


Næstved, Denmark

The Danish System

**THE MOST EFFICIENT WASTE TREATMENT SYSTEM IN
EUROPE**

- THROUGH 100 YEARS -



Got an ISWA's publication award 2006