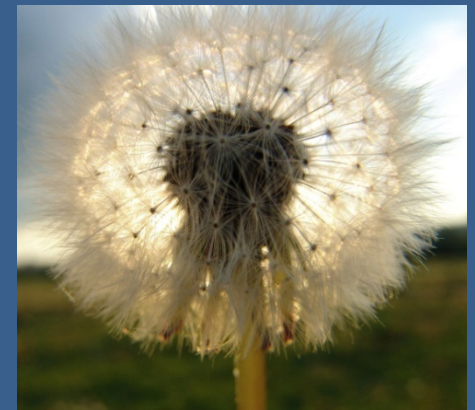


# Success of Waste to Energy in Denmark

Jacob H. Simonsen  
RenoSam

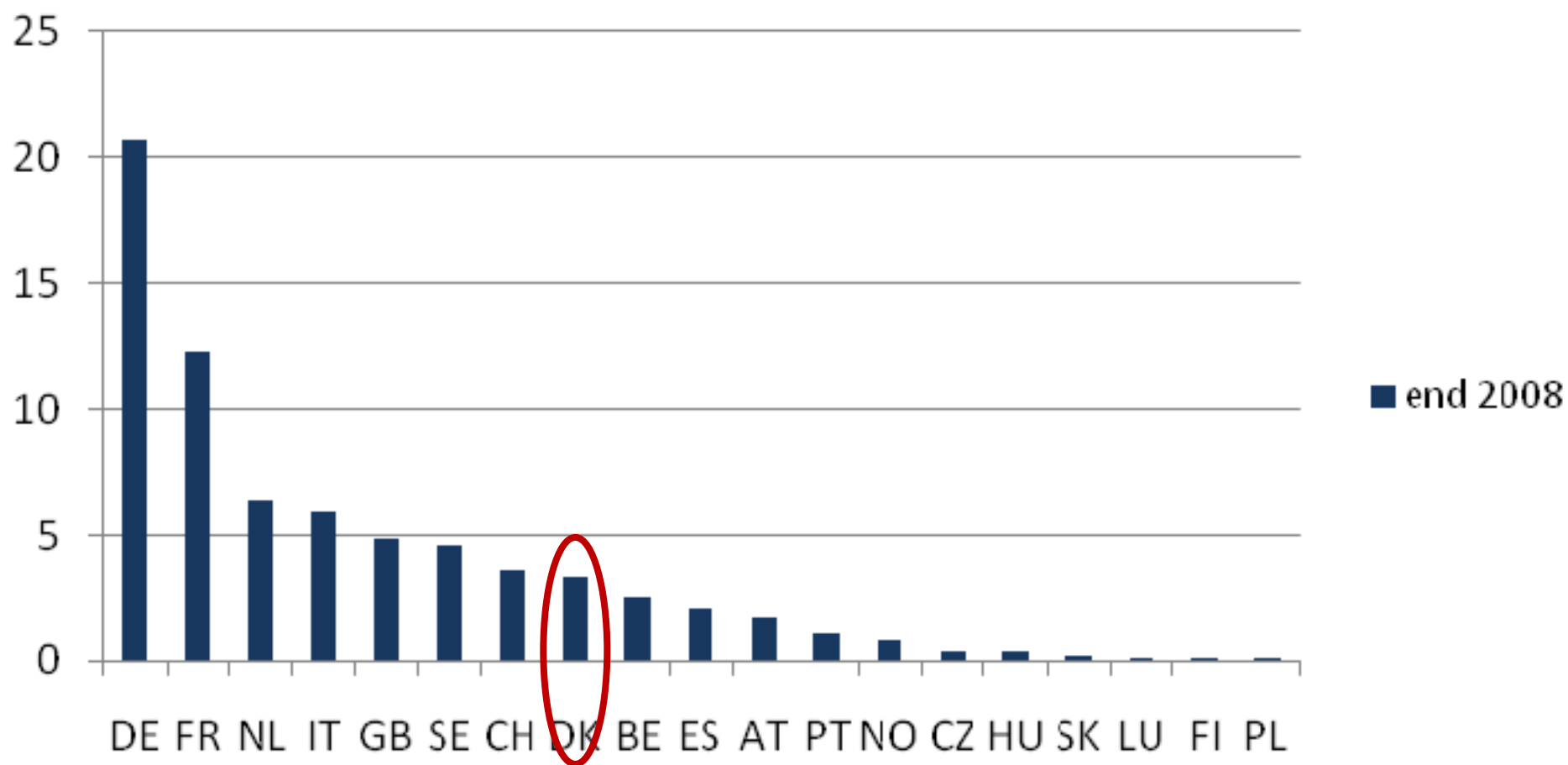


# Do we have success in Denmark?

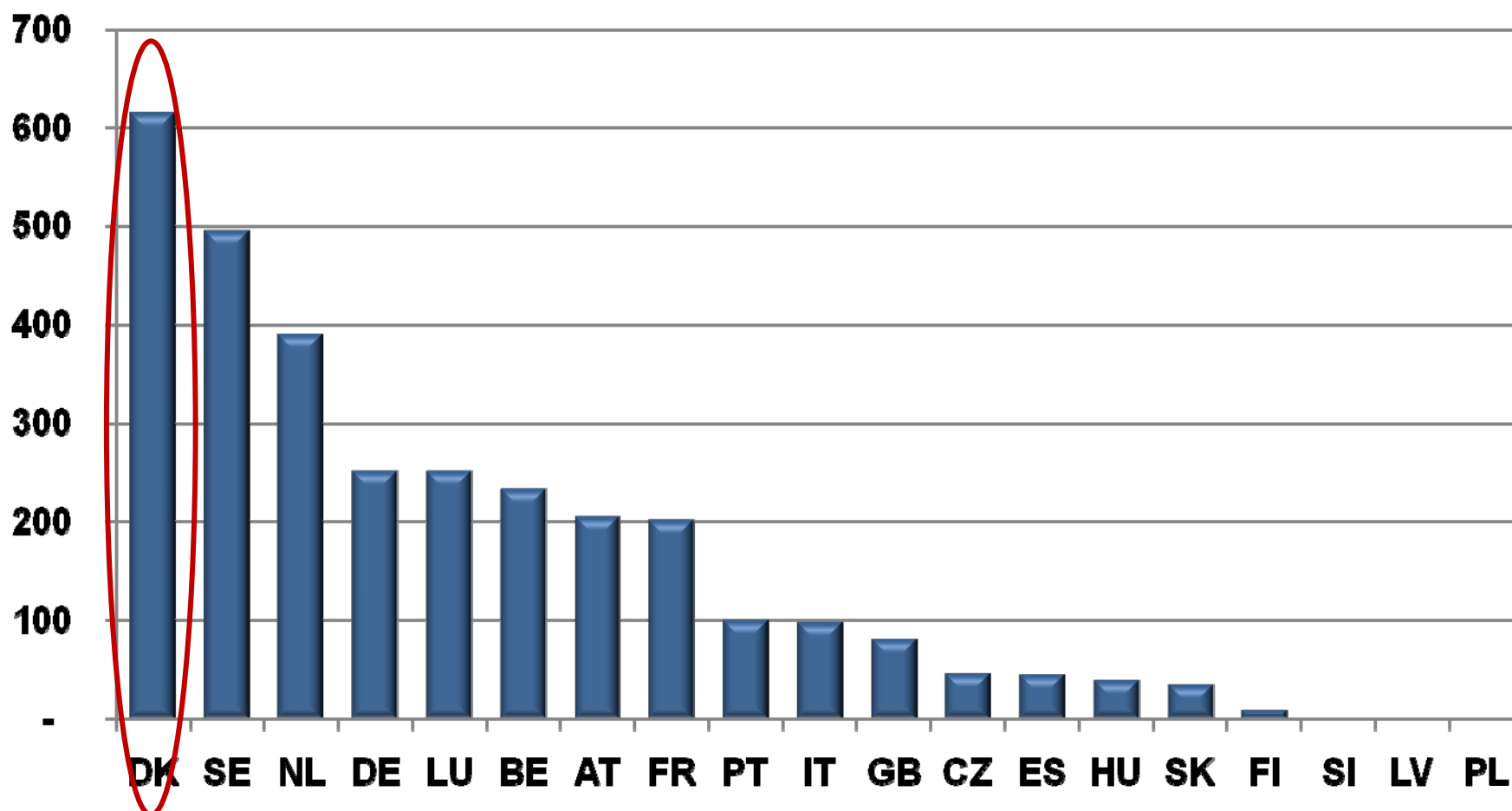


# WtE capacity in Europe by end 2008

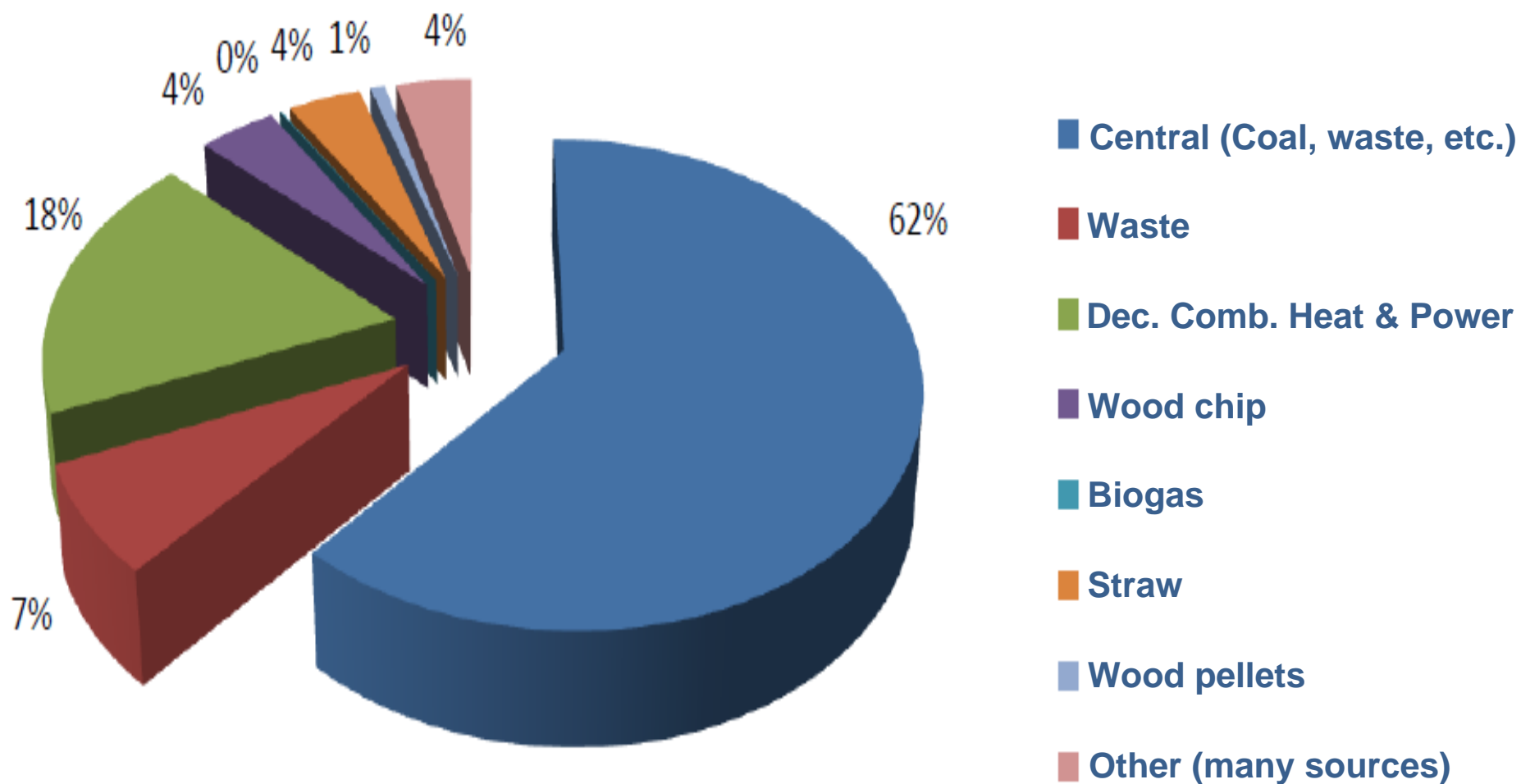
(in total 71 million tonnes)



## Capacity per. inhabitants (Kg/year)



# Heat production in Denmark



- **Roughly 40% of the renewable energy in Denmark comes from WtE**



## Flow Control

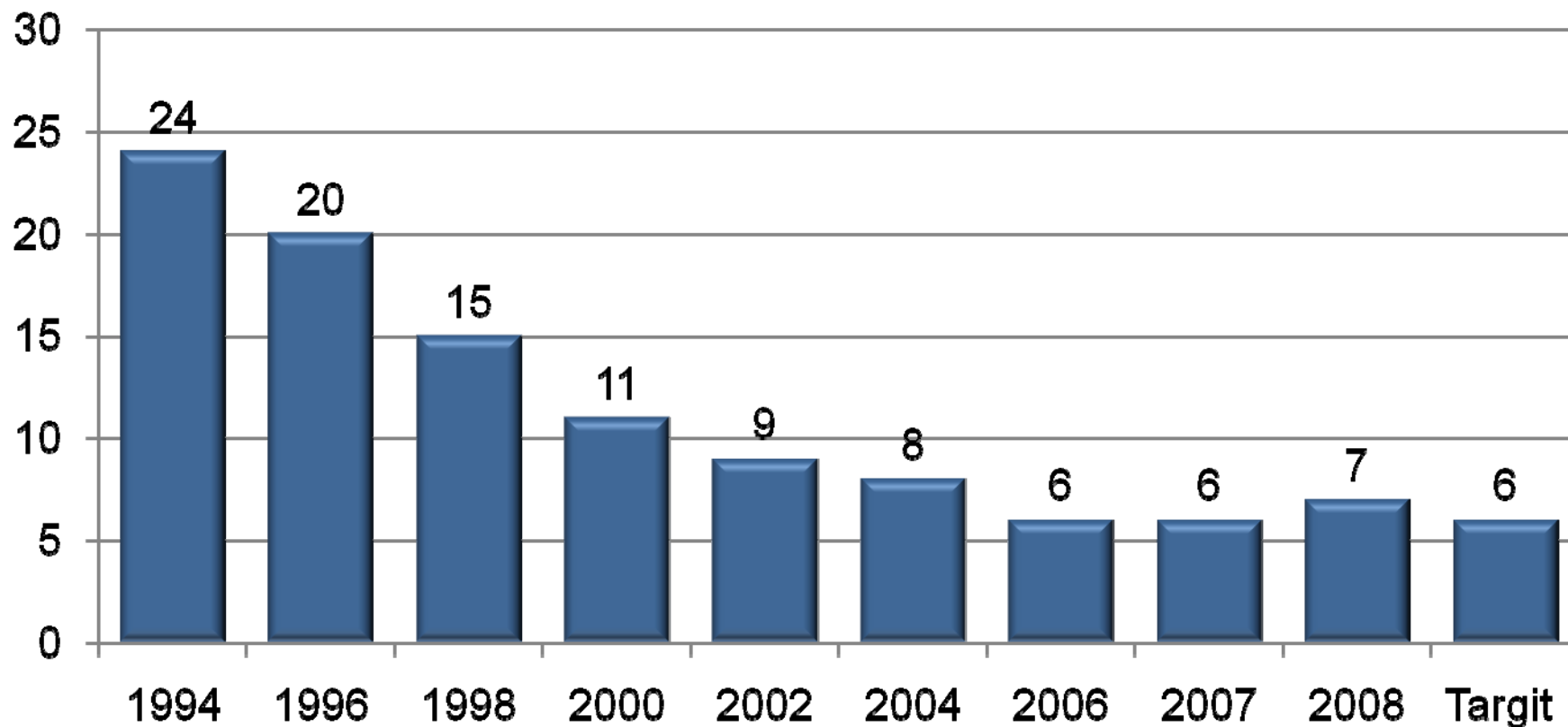
- **The municipalities have the total flow control of all waste for incineration**
  - Household waste
  - Industrial waste (since 1989)
- **Minimizes risk when building capacity**



## Ladfill ban

- **Landfill ban on all waste that can be incinerated**
  - In force since 1. January 1997

## % of Waste for landfilling in Danmark



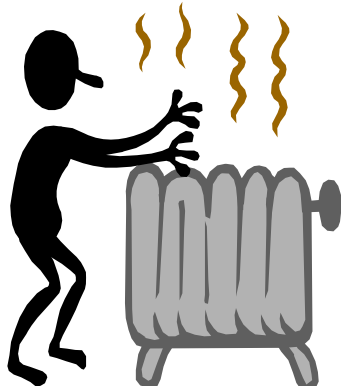
## High utilization of energy

- **WtE = Combined heat and power plants**
- **Wide spread district heating systems**
  - Tradition for setting up collective heating systems
  - Demand for heating is great

1 ton Waste



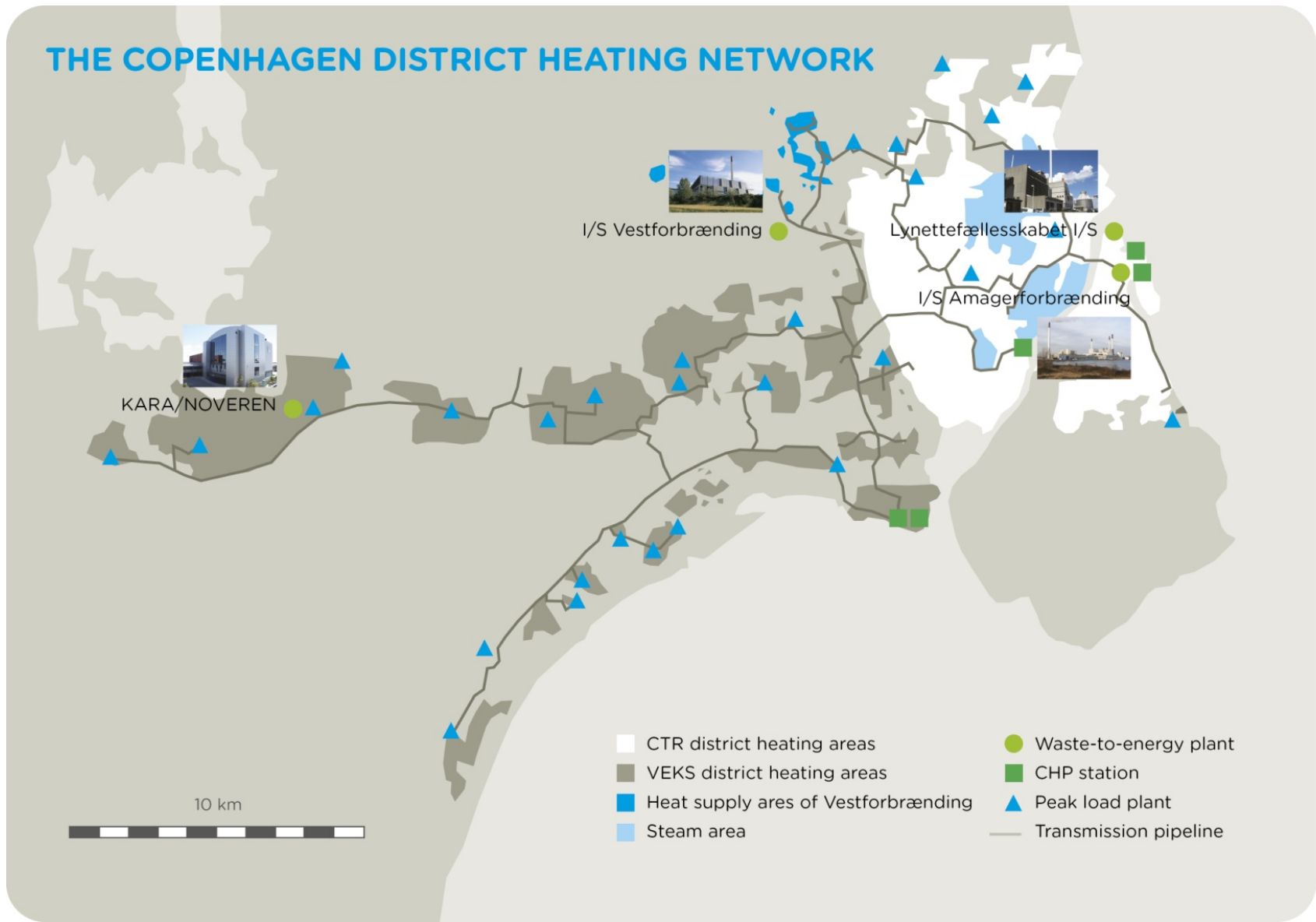
2 MWh Heat



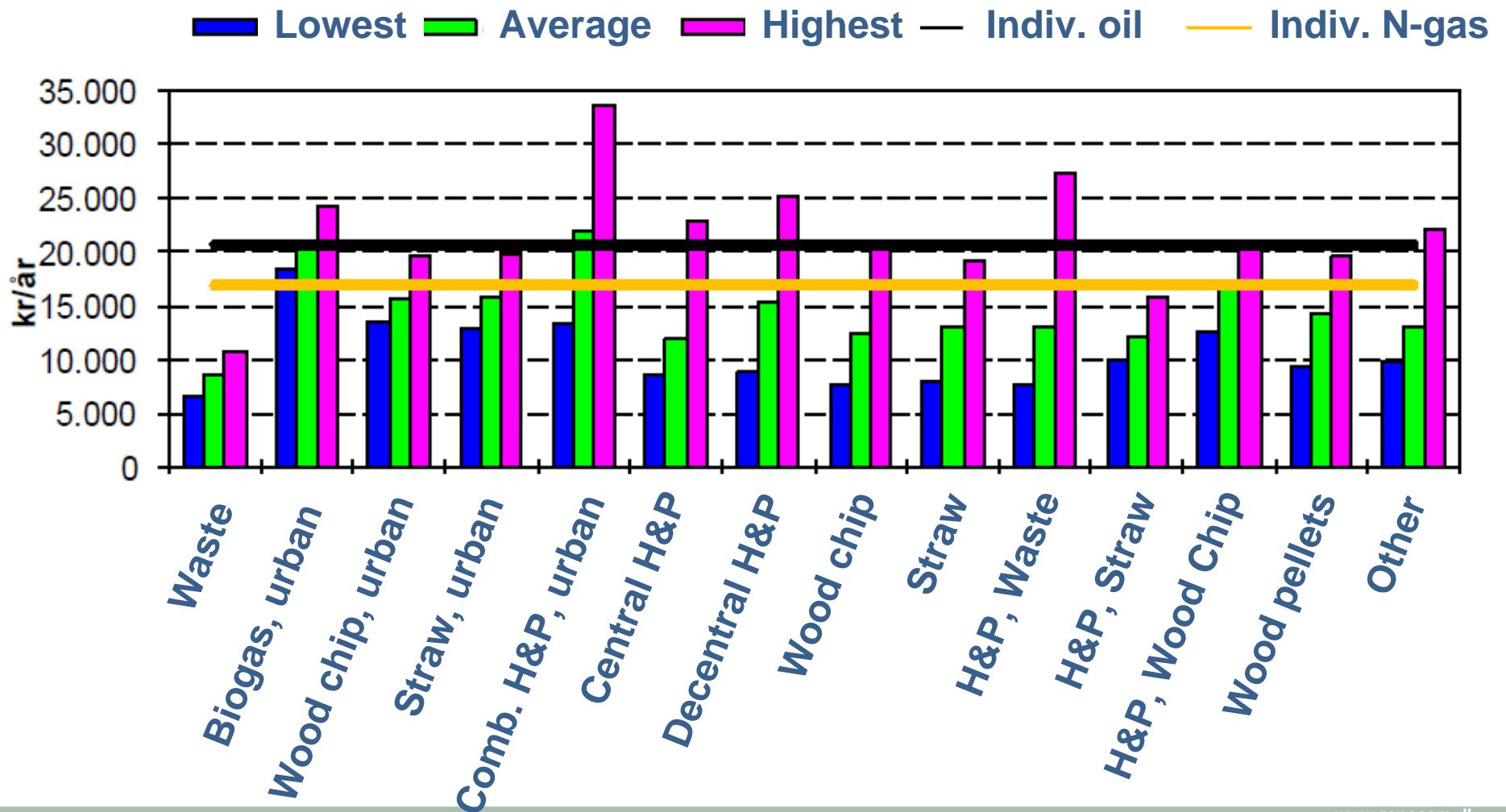
2/3 MWh Electricity



## THE COPENHAGEN DISTRICT HEATING NETWORK

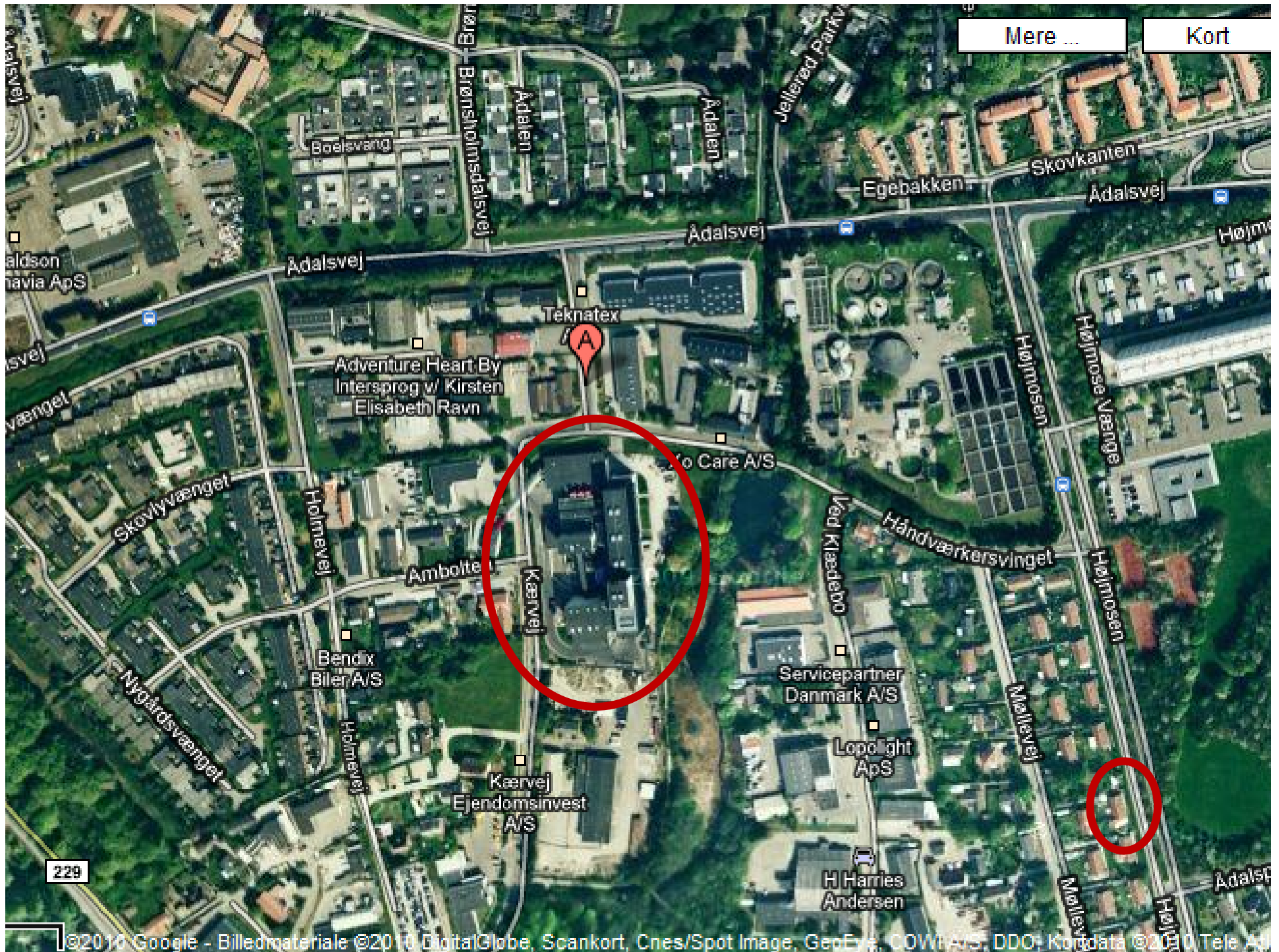


# Cheap heat – (price of heat incl. VAT)



# Market price

- **Electricity**
  - North pool market price
- **Heat – the lowest of the following**
  - Cost of production
  - Cost of Substitution
  - Fixed price cap



Mere ...

Kort

229









## Challenges ahead

- **Taxes on incineration**
  - Great difference between Denmark and our neighbors
- **Liberalisation**
  - Loss of flow control
- **Renewal of capacity/new capacity**

## Incenneration tax

|                 |                              |
|-----------------|------------------------------|
| <b>Denmark</b>  | <b>55-70 Euro/ton</b>        |
| <b>Sweden</b>   | <b>None after 01.10.2010</b> |
| <b>Norway</b>   | <b>None after 01.10.2010</b> |
| <b>Germany</b>  | <b>None</b>                  |
| <b>Holland</b>  | <b>None</b>                  |
| <b>Other EU</b> | <b>0-100 kr./ton</b>         |



## Success factors

- **Flow control**
- **Landfill ban of waste that can be incinerated**
- **High utilization of energy**
- **High energy efficiency**
- **High public acceptance**