

5th CEWEP Congress on Waste-to-Energy 2010

30 June to 2 July
in Antwerp

Carsten Spohn

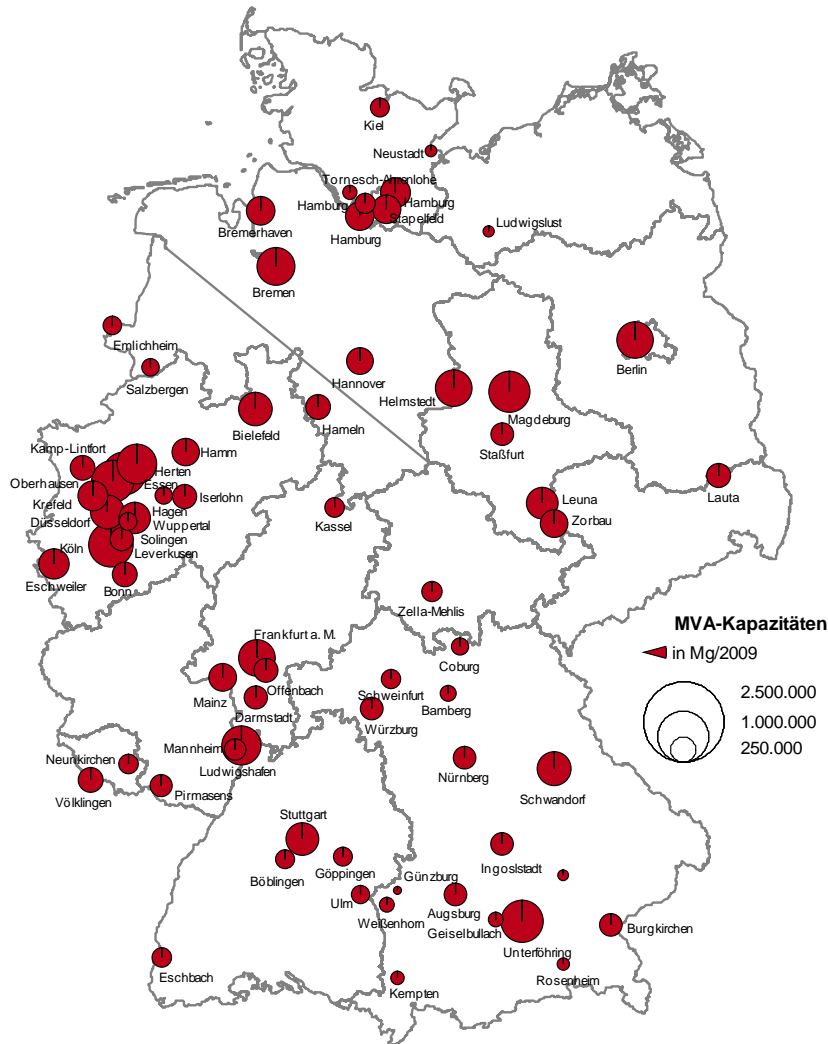
Practical examples how to improve energy efficiency



*Interessengemeinschaft der
Thermischen Abfallbehandlungsanlagen
in Deutschland e.V.*



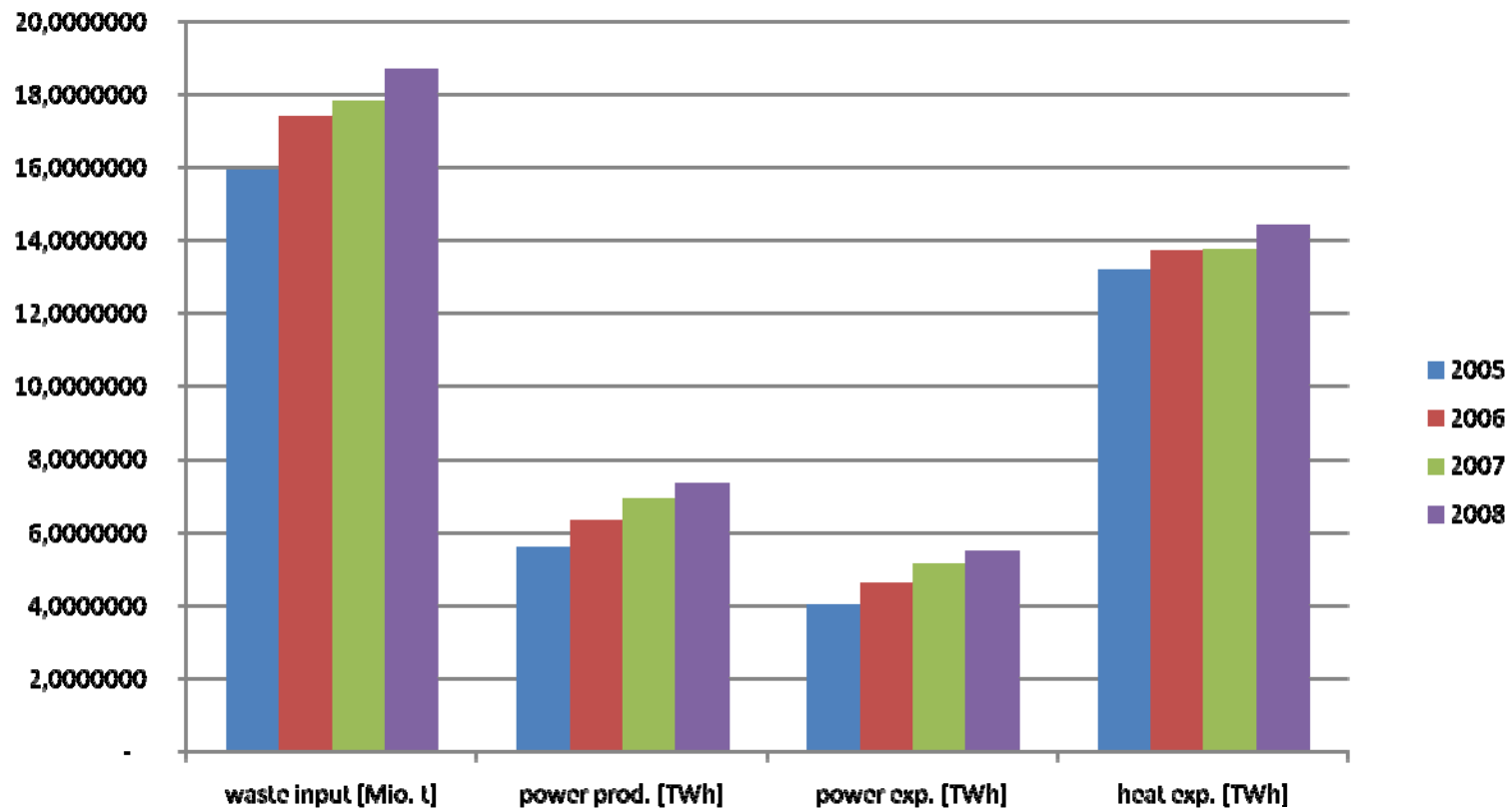
Location and Capacities of WtE-plants in Germany



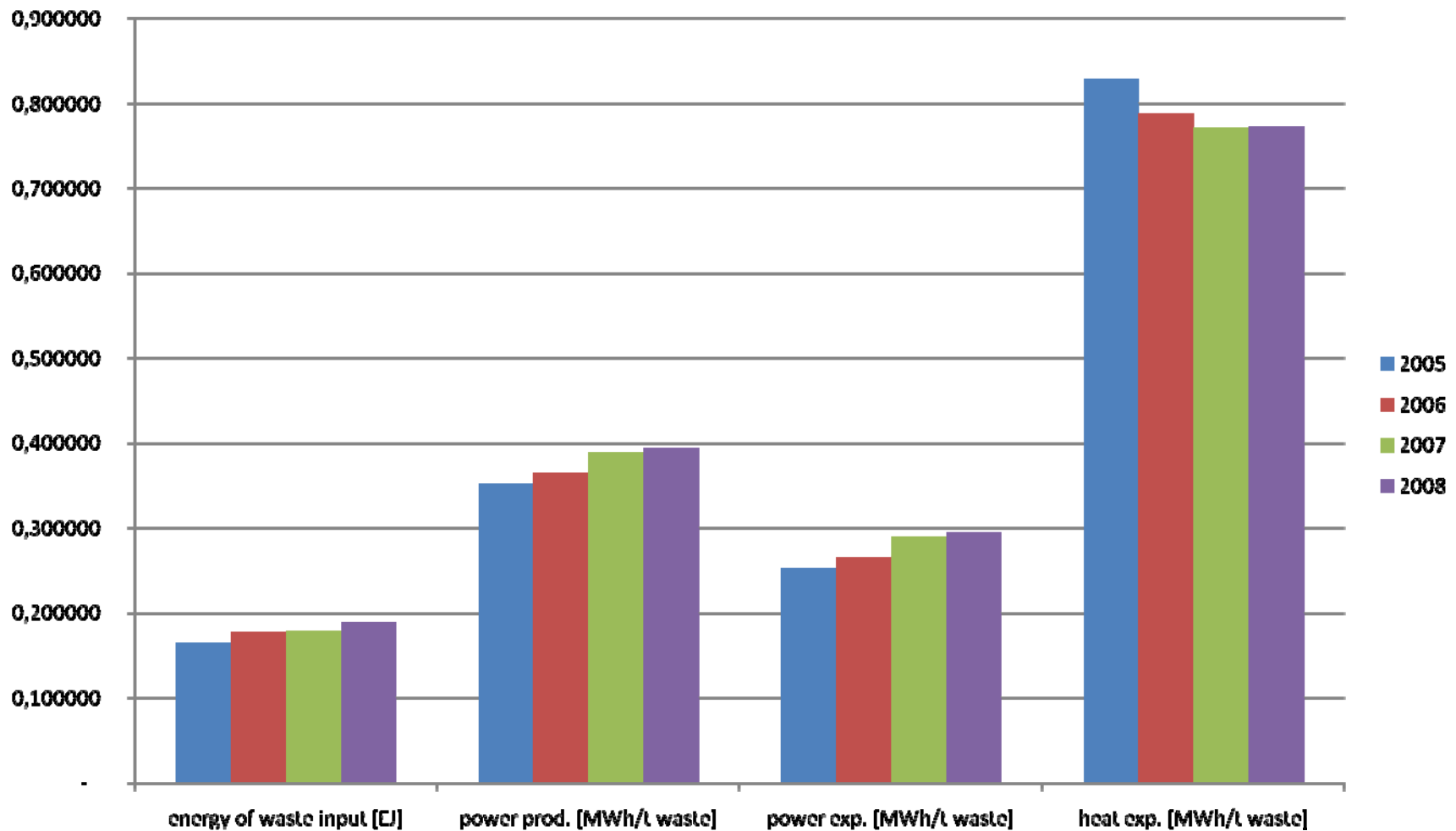
Energy Key Figures of German WtE-plants (without RDF)

value	2005	2006	2007	2008	increase/decrease 2005 to 2008
heat exp. [mil MWh]	13.19	13.72	13.75	14.44	+ 9.5 %
Generator output [MW]	1 210	1 250	1 330	1 440	+ 19.0 %
power prod [mil MWh]	5.51	6.26	6.93	7.35	+ 33.3 %
power exp. [mil MWh]	3.95	4.54	5.16	5.50	+ 39.1 %

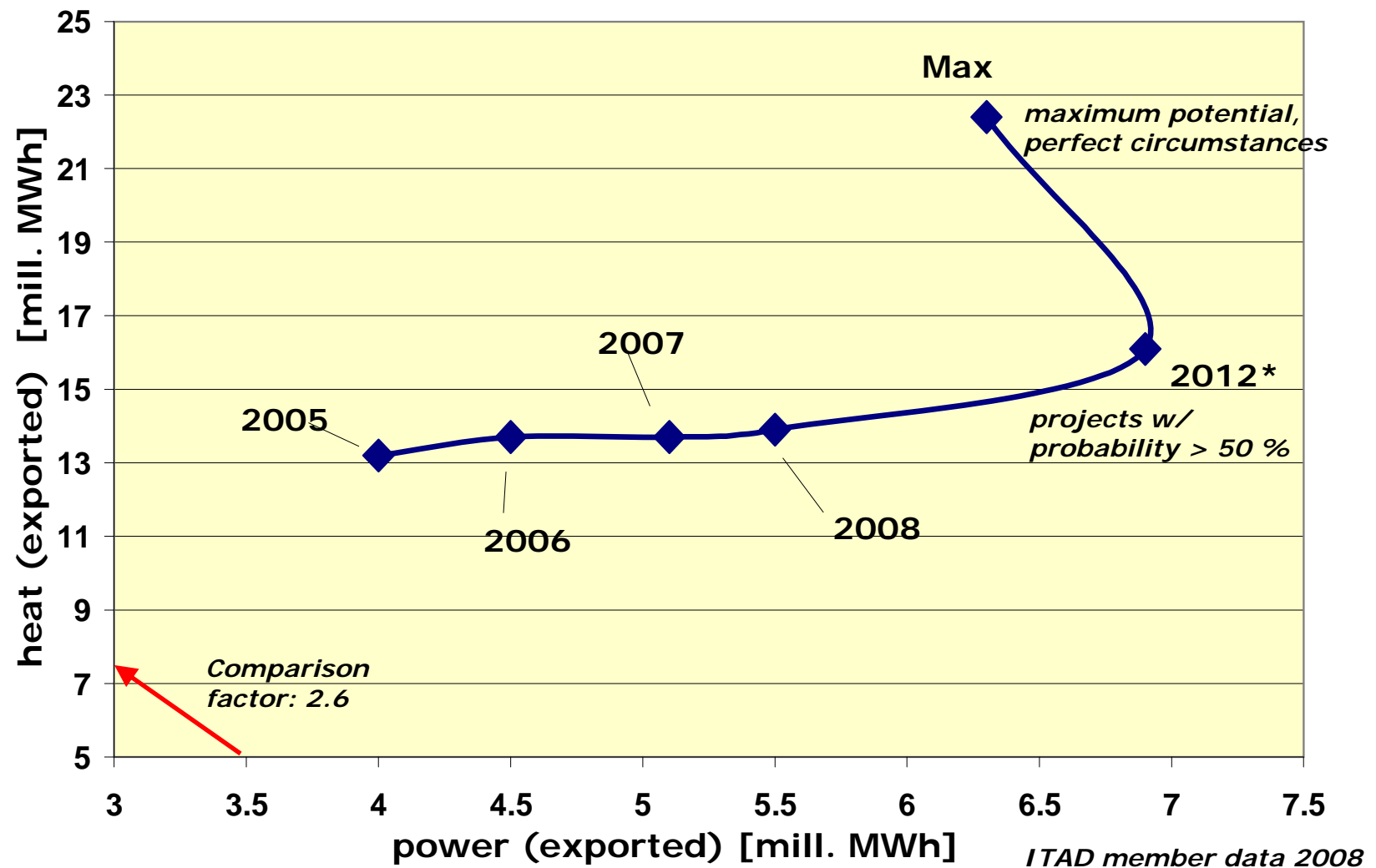
Energy Efficiency of German WtE-plants



Specific Energy Efficiency of German WtE-plants



Potential Energy Production

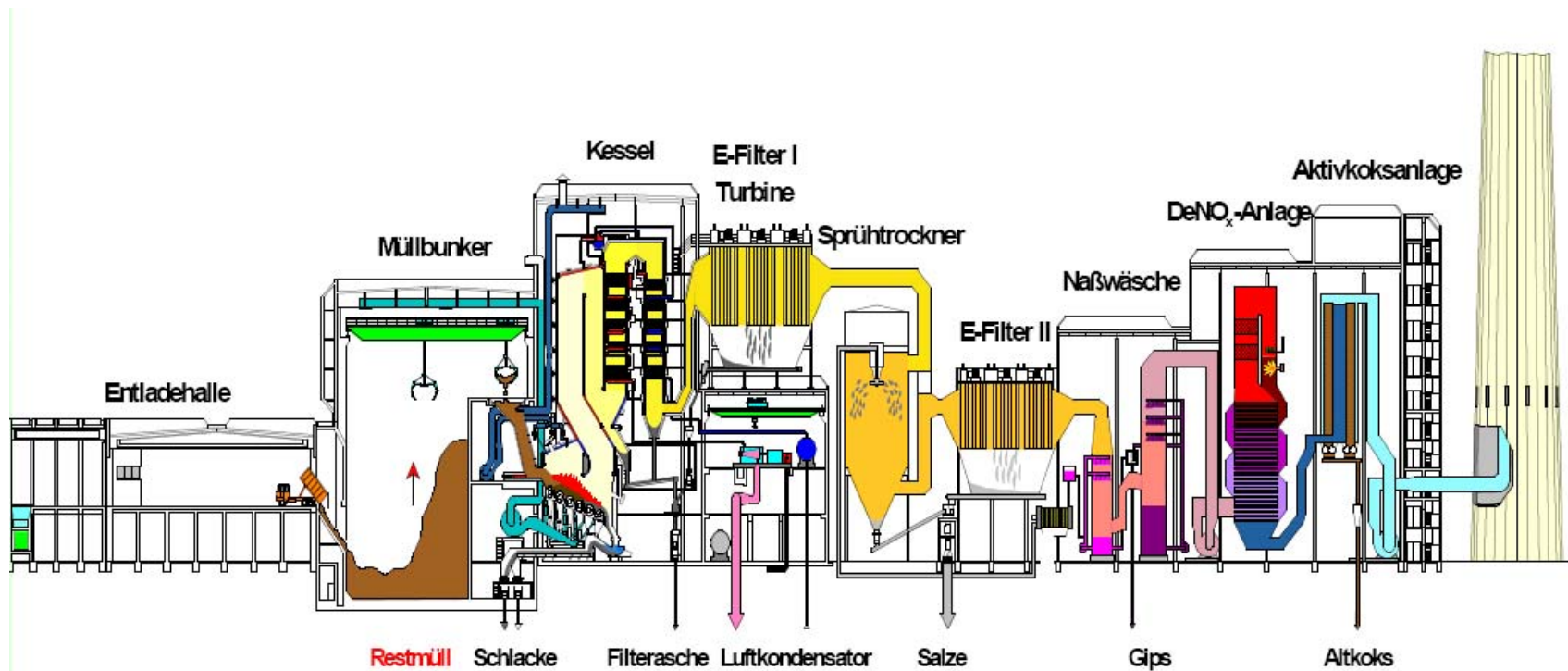


Increase of Energy Efficiency - Technical Measures

- direct optimisation of energy extraction
(turbine, generator, steam parameters, switch to ORC?)
- increase of availability
- minimisation of energy import
- **increase of heat export/use**

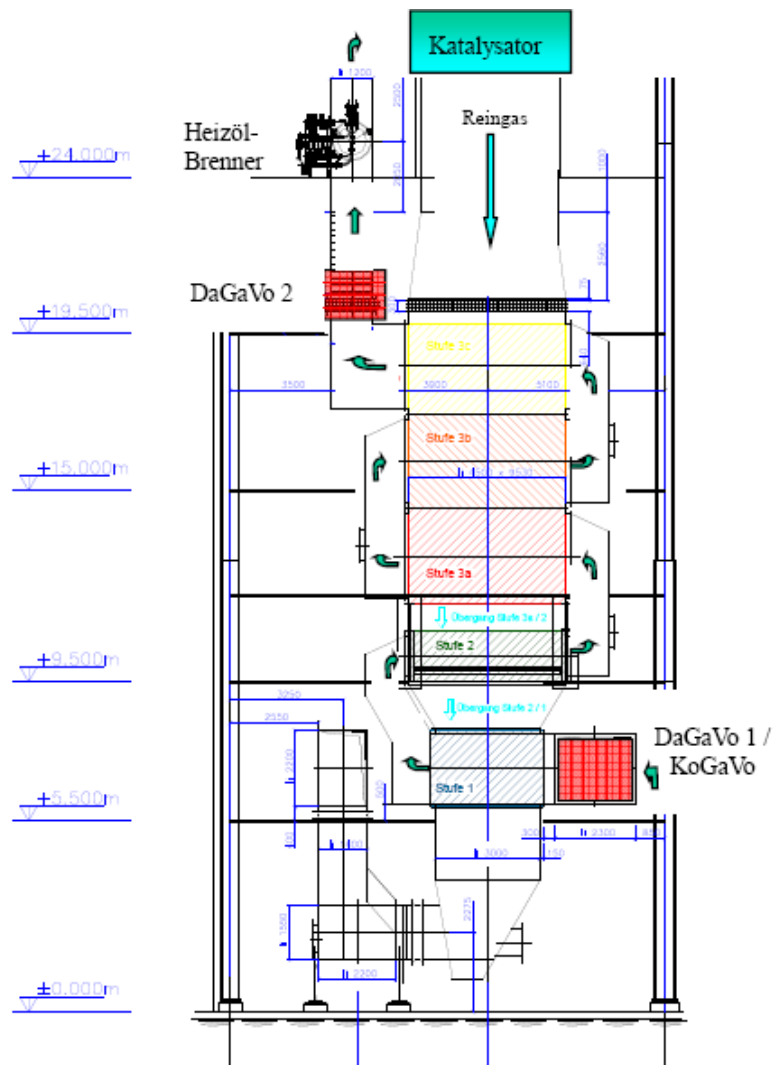
Example I Optimizing internal heat use for SCR

Boundary conditions:



plant capacity ca. 250.000 t/a (2 lines)

$R1 \cong 0,7$



Internal heat use for SCR

Decrease of cat temperature:

320 °C -> 220 °C

substituted oil:

3 mio. l/a

Increase of energy efficiency (R1):

0,07

Example II

Increasing heat export into an integrated district heating network

Boundary conditions:



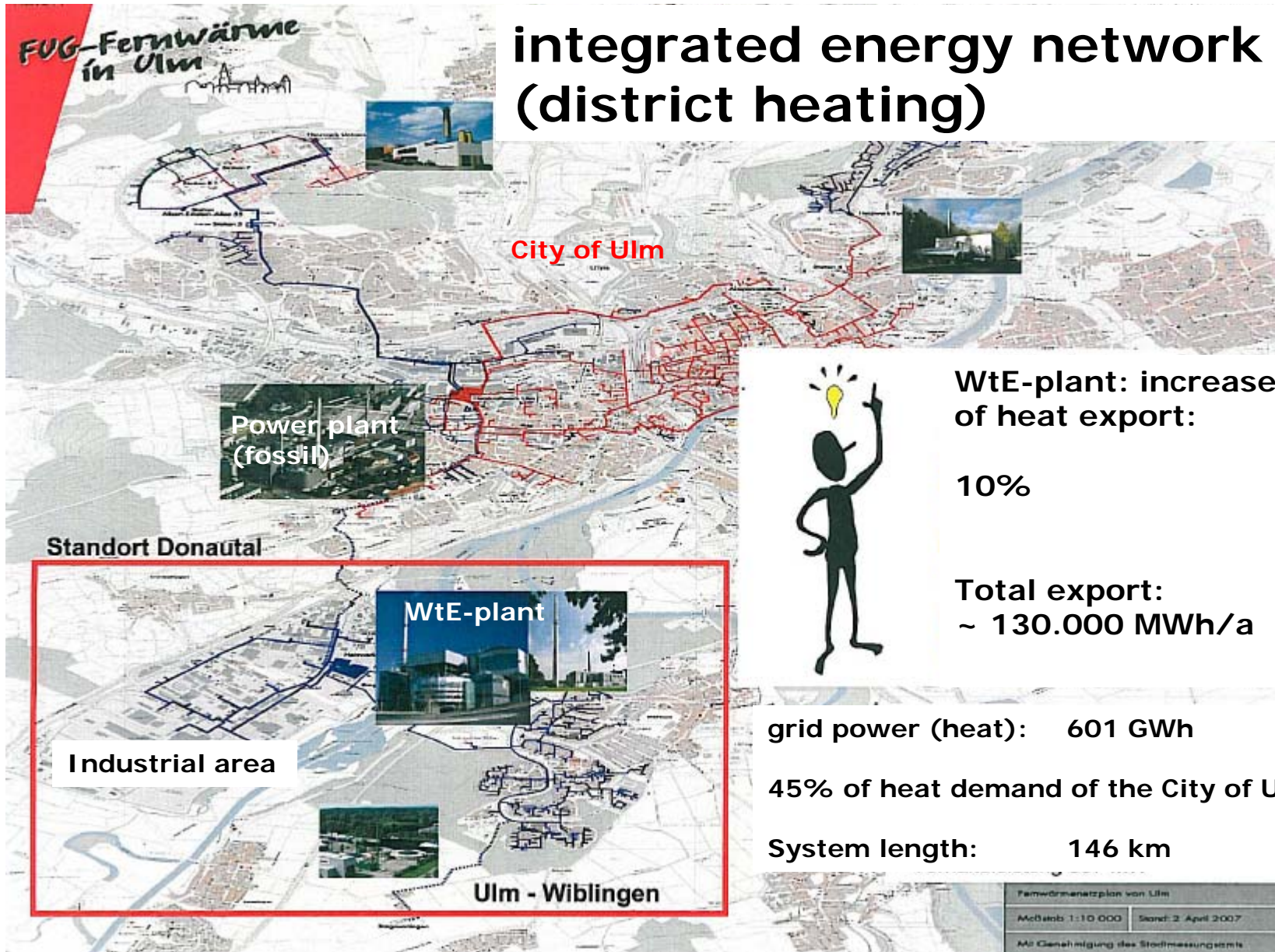
TAD Ulm

plant capacity:

ca. 150.00 t/a (2 lines)

power export:

ca. 40.000 MWh/a



Example III

Increasing heat export with mobile heat storage tanks

Boundary conditions:



plant capacity:

ca. 300.00 t/a (4 lines)

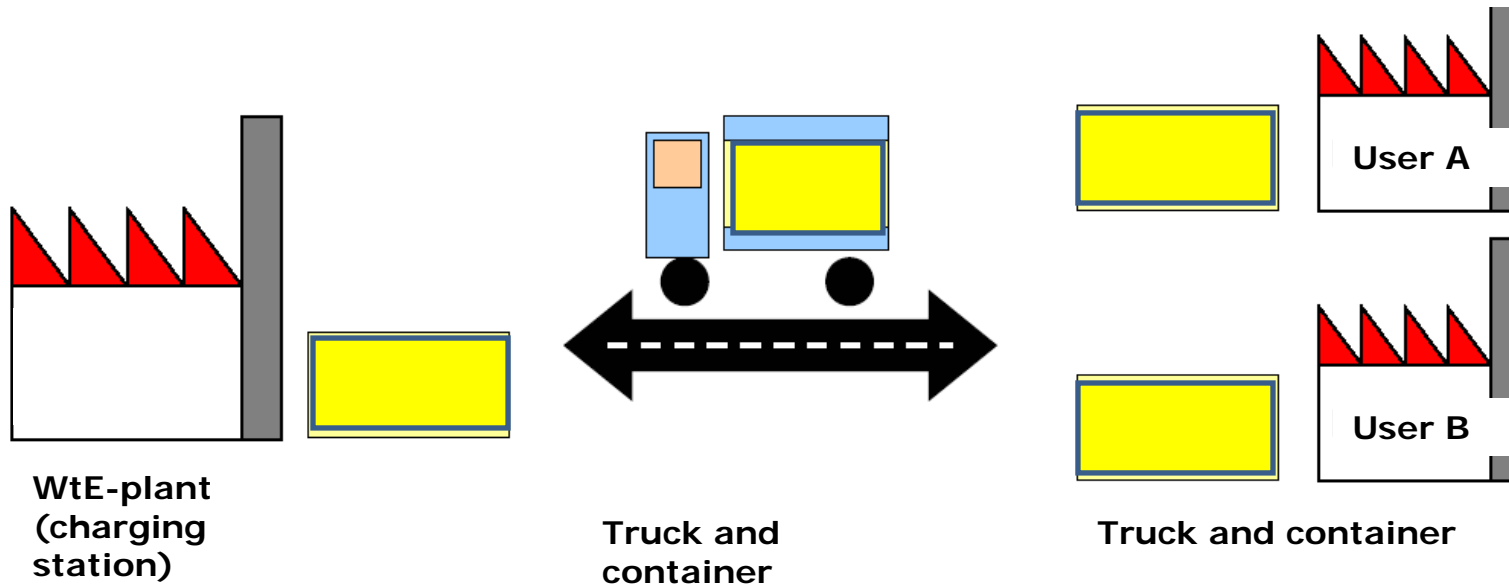
power export:

ca. 110.000 MWh/a

heat export:

no possibility of heat
export yet (no district
heating net or industrial
steam user)

Main principle:



Using heat from

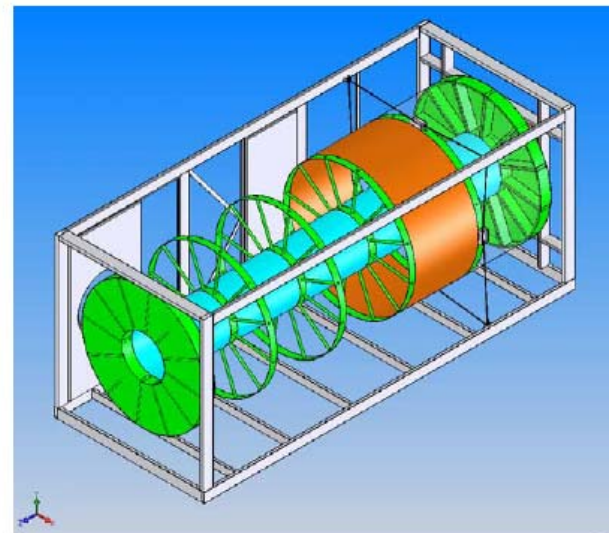
- steam (150°C)
- flue gas (250°C) - optional



Mobile heat storage tank:

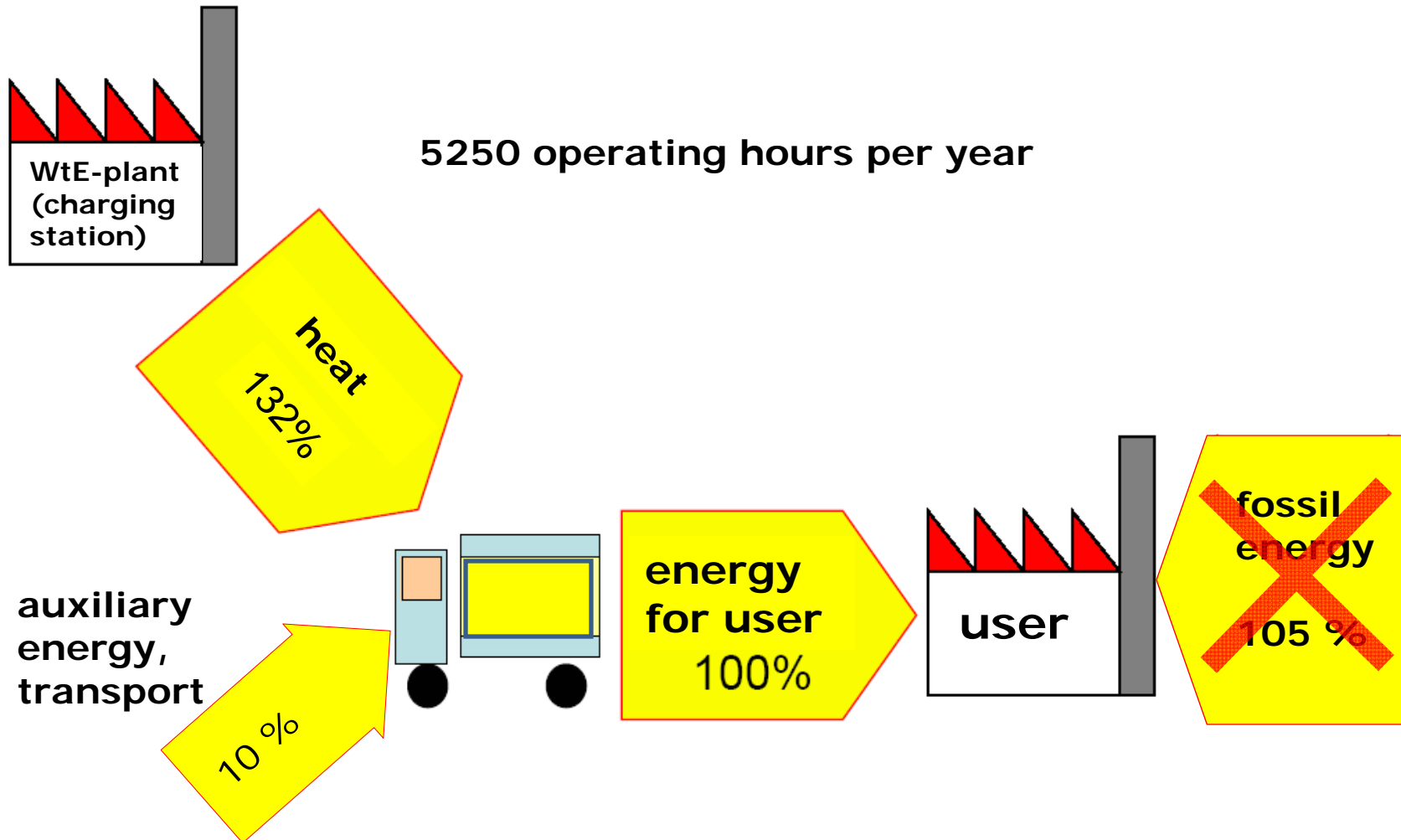
Using a modified standard container

volume of storage medium	15 m ³
Mass of storage medium	12 t
Surface	23,2 m ²
Max. air flow rate	20.000 m ³ /h
Charging time	4,6 h (150°C) 3,9 h (250°C)



thermal capacity 2,6 MWh

Efficiency – energy flow



Thank you for listening.

Any questions?

Contact us!



ITAD *Interessengemeinschaft der
Thermischen Abfallbehandlungsanlagen
in Deutschland e.V.*

*Martinstraße 21, 97070 Würzburg, Germany
+49 (0)931- 200 90 6-0*

*info@itad.de
www.itad.de*