



Energy savings through existing technology

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Per Boysen • International Sales Manager • Danfoss District Heating • E-mail: per_boysen@danfoss.com

Programme

- Introduction
- Danfoss A/S – profile
- The pull for energy savings
- The need for District Heating & Cooling
- RES Directive
- Danfoss examples of savings from District Heating
- The role of District Heating & Cooling in the future

Energy saving technology is already here!

- ...and has been so for several years.
- District Heating & Cooling (DHC) offers the energy efficiency and supply stability which is demanded now and will be in the future.
- As a multi-fuel system, DHC can extract the best from any source of energy – including those of the future.



Danfoss philosophy



Energy savings start with the consumer and end with the district heating plant

Danfoss is...

Headquarters





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•
Danfoss Gearmotors
•
Danfoss Silicon Power
•
Danfoss Solar Inverters

Owner share
55 %

Danfoss Services Division
Roland Fritsch
Senior Vice President

Danfoss Global Business Services • Danfoss Industri Service • Danfoss IT

Group figures

- Danfoss is a family-owned, global company (no public shares, but approx. 3% employee shares)
- Net sales 2007: EUR 3,000 mill
- Employees: 22,500 worldwide (March 2008)
- Production of 250,000 items per day

	Europe	North America	Latin America	Africa	Asia	Pacific	Total
Manufacturing sites	50	12	2	1	5		70
Sales companies	83	10	5	1	12	2	113
Agents and distributors							~115

International sales and services



Danfoss is the worldwide #1 Supplier within District Heating



The expanded Danfoss product range

Large distributor stations



Commercial and multi-family house substations



One-family house and flat substations



Our products are found in the entire DH system - from the utility to the consumer



The pull for energy savings

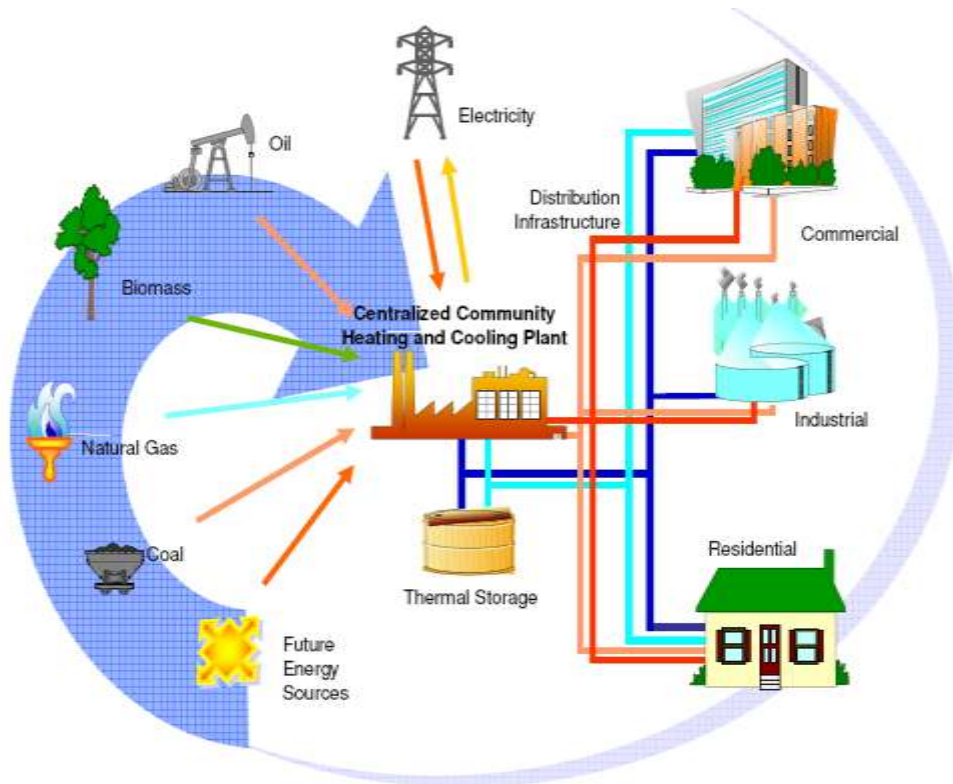


- **Scarce resources**

- **Climate change**

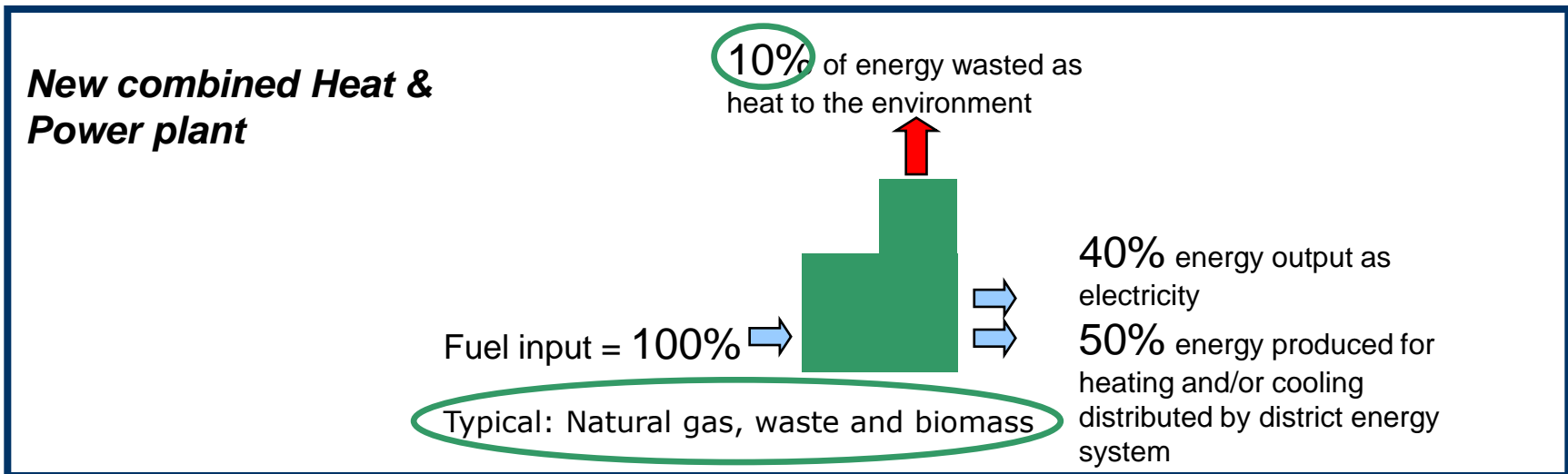
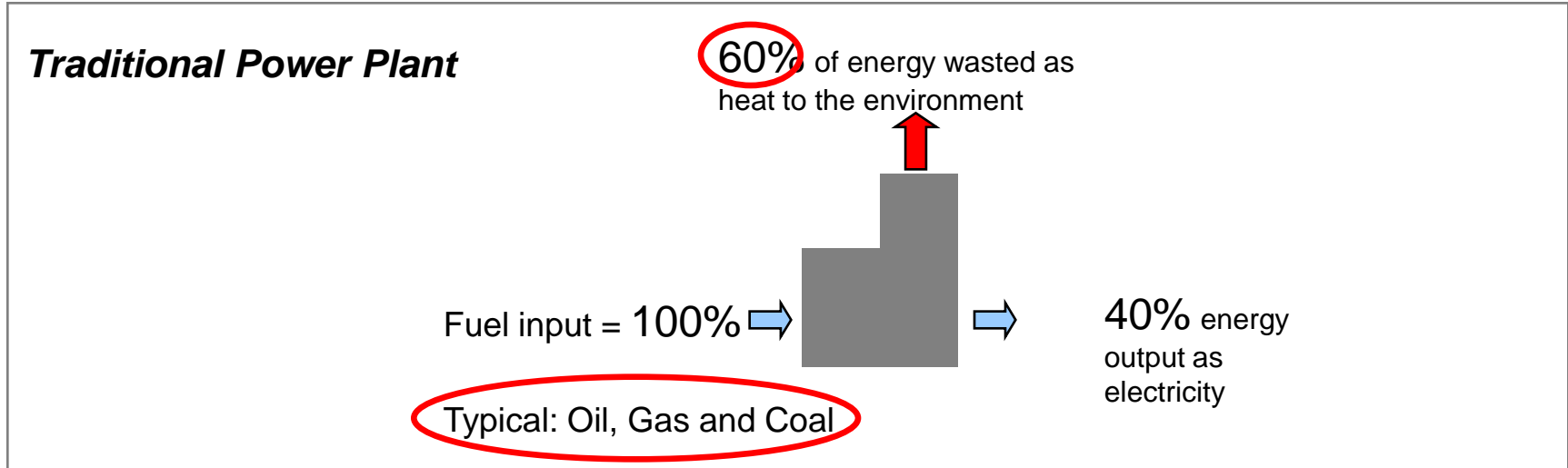
- **Responsibility for the next generations**

District Energy – The Concept



Any energy source, renewable, present or future, can be used in the District Energy system!

District Energy - Centralised Community Heating Plant as the Core



The RES Directive by EU



■ In Spring 2007 EU decided on it's 20x20x20 in 2020:

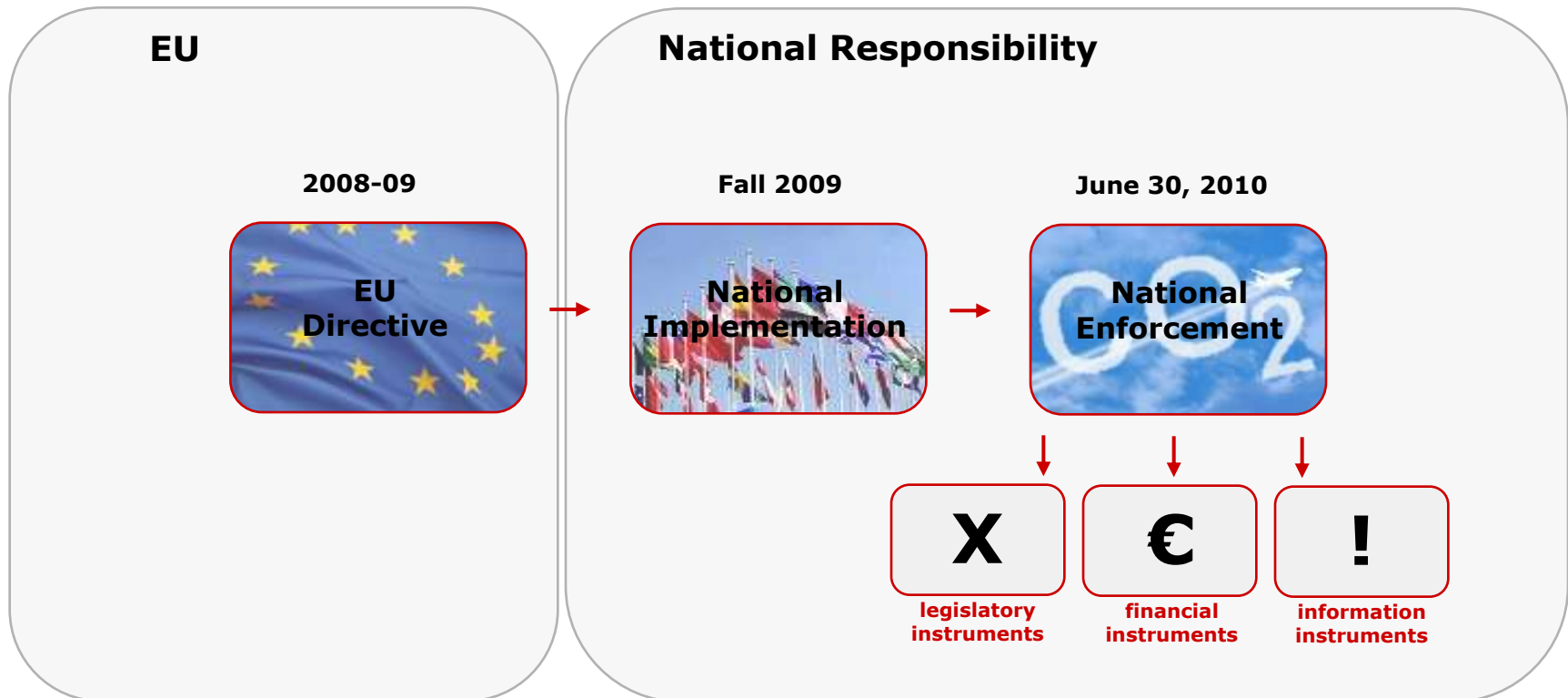
- 20 percent increase in energy intensity (efficiency)
- 20 percent reduction of CO₂
- 20 percent renewable energy

- **Achieving this ambition will at least cost EURO 100 bn (Barroso)**

- ≈ EURO 155 per year per European citizen.
- UK: £9 bn. per year (open Europe).

- **The Climate and Energy Package contains the Directive on Renewable Energy Sources (RES) outlining how to achieve 20 percent renewable energy.**
- **District heating and heat pumps play significant roles in the RES Directive.**

The implementation process



District Heating & Cooling is now accepted as being a vital part of the future energy supply!

Examples of energy savings



Petropavlovsk city, Kazakhstan, 2003

- 120 flats building, consisting from 2 equal blocks with identical technical characteristics and 2 inputs of heat
- One part of building, which was selected as a bench was equipped only with a heat counter. Pilot part was equipped with full set of devices for automatic regulation of heat consumption.

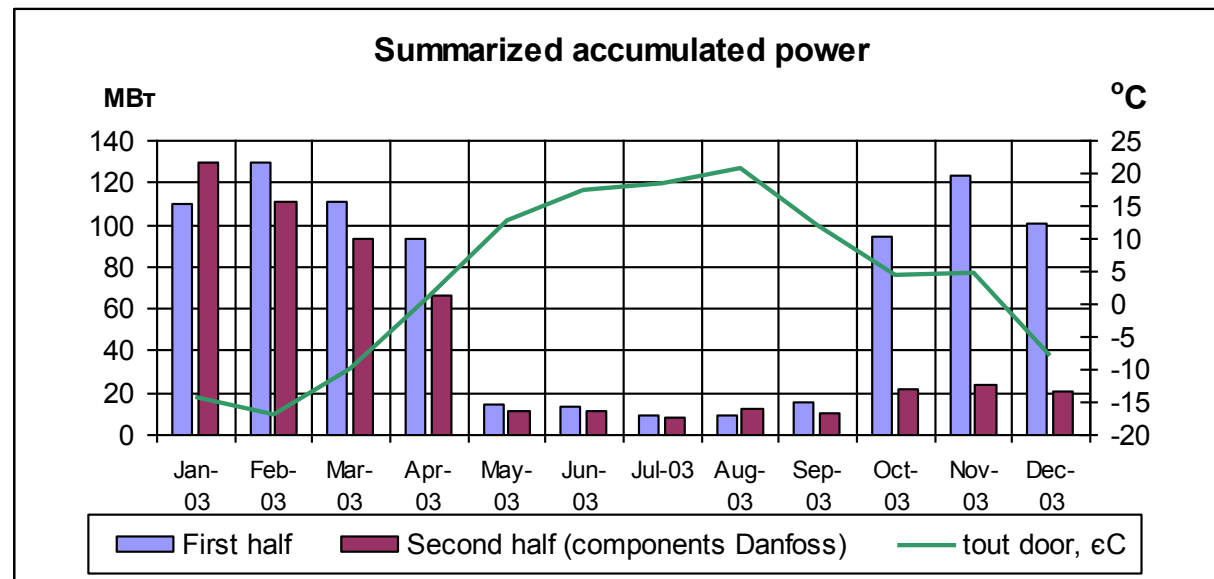


Petropavlovsk city, Kazakhstan, 2003

■ Electronic Controller ECL Comfort 300, differential pressure controller, seated valves, gear actuators for dependent schematics of heating and independent schematics of hot water supply



■ Energy saving effect for whole year (January 2003 - December 2003) - 26%

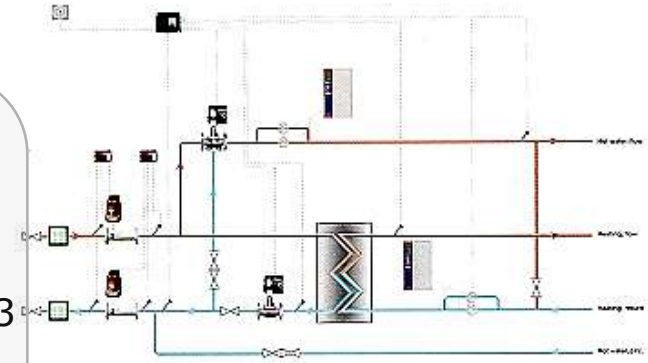


Kurchatow, Kursk Region, Russia

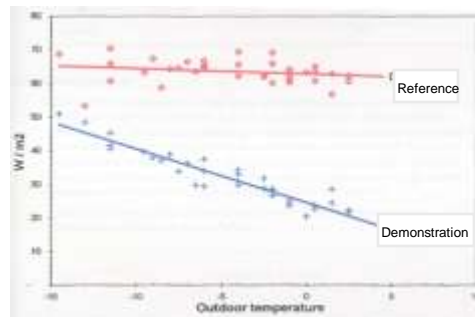
Carl Bro A/S (1999)

- Three 14-storey residential buildings connected to one substation;
- reference 3 similar buildings connected to another substation.

- weather compensator and a new heat exchanger in the substation;
- radiator thermostats, balancing valves and differential pressure valves in 3 demo buildings;
- energy meters;
- consumption based billing system.



2 seasons monitoring programme



• 50% reduction in space heating consumption

Gdansk, Poland

Dansk Energi Management (1998)

- 9 multi-family houses in different areas of Gdansk;
- 9 adequate buildings as references.



- new compact substation;
- automatic balancing valves;
- radiator thermostats;
- energy meters;
- consumption based billing system.



Danfoss



2 seasons monitoring programme

- **37% reduction in space heating consumption**

The prospects for District Heating & Cooling

- District Heating and Cooling has been **around for decades**. The principle of central production of energy is nevertheless **just as relevant now and in the future due to the high effectiveness, low pollution and supply stability in a DHC system**.
- There are **multiple examples of the energy saving effects** of effective District Heating and Cooling systems. When **combined with renewable energy sources**, DHC becomes a **very powerful energy system**.
- By the RES directive, **the important position of DHC in the future** could not be stated any clearer.

Danfoss philosophy



Energy savings always start with the consumer and end with the district heating plant