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WÄRMEPUMPEN

Efficiency and intelligent construction

OCHSNER Heatpump GmbH

Brüssel, 5.11.2013

REDEVELOP
RECREATE
RETHINK
2nd International Research Conference
5-6 November 2013 - Brussels
DHC+

DI (FH) Martin Reder

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Content

- How to use ambient heat
- How to use waste water
- Applications of heat pumps
- Intelligent use of smart grid
- Types of heat pumps
- High temperture heat pumps
- Reference

Ambient heat

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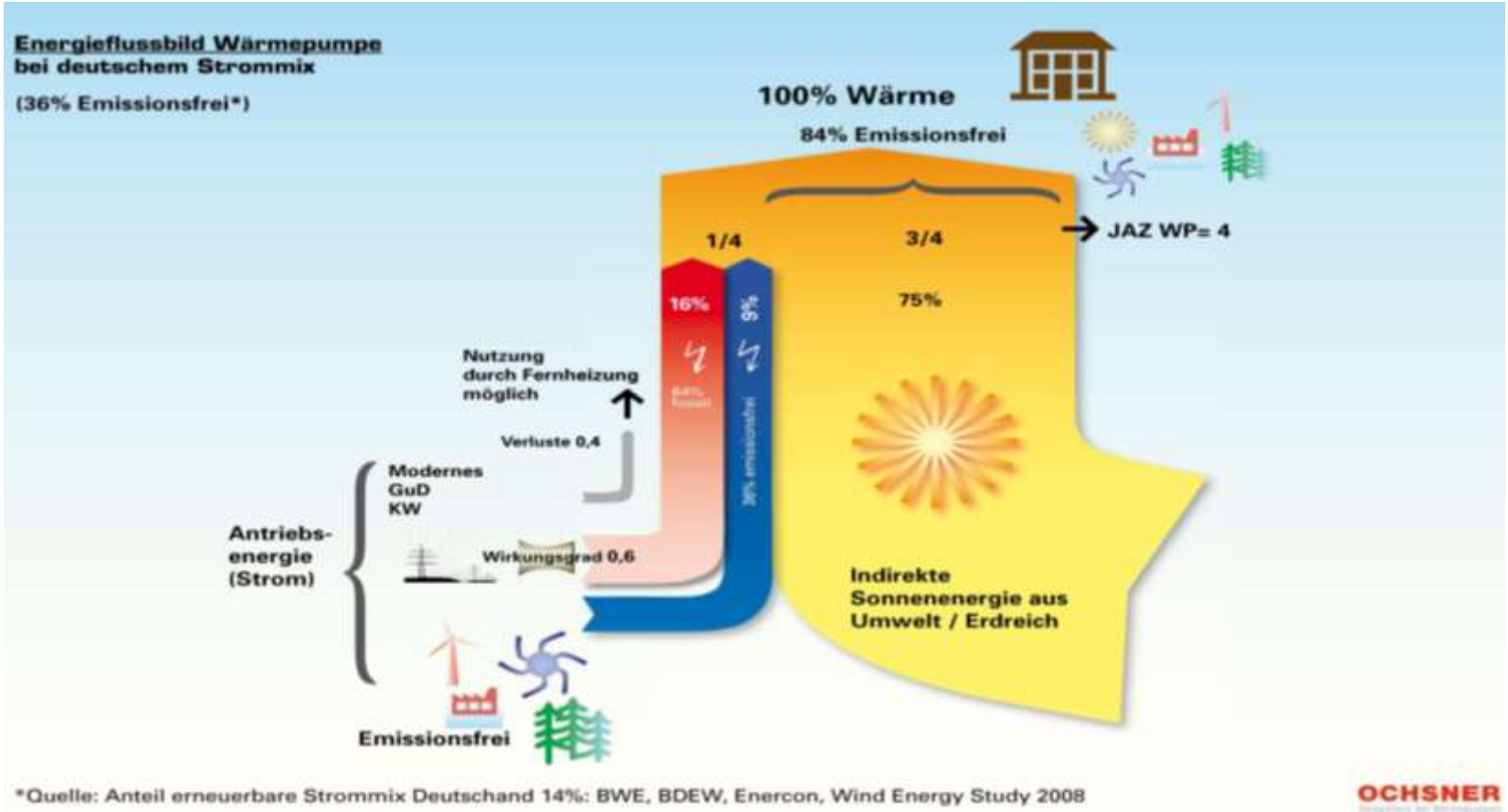

Waste water heat

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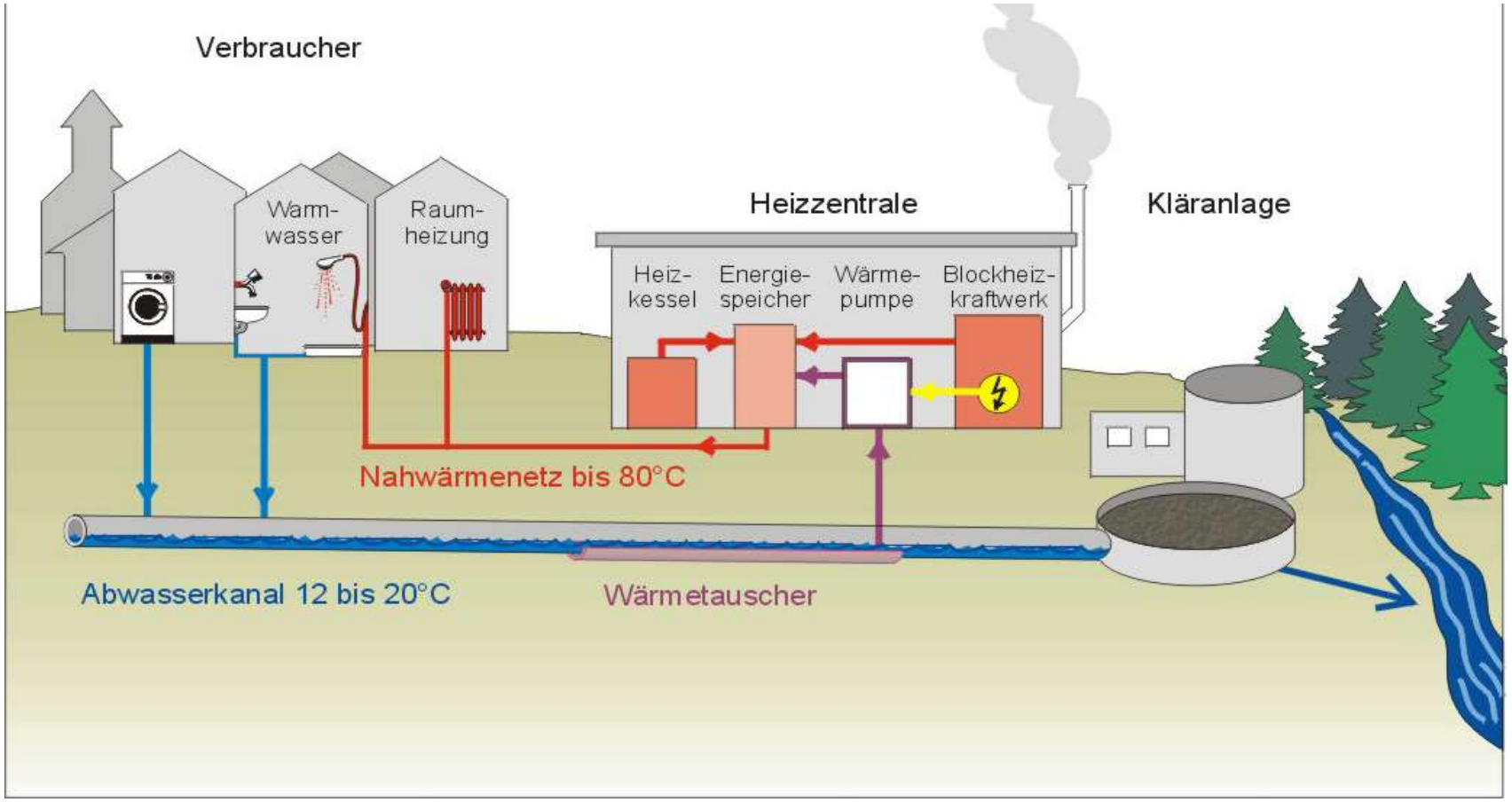

Smart Grids

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- **Increase of overall efficiency** esp. by avoiding cuttings during peak loads
- (savings in peak loads ~2 GW) > reduction of cut-off energy from wind power (by up to 20%) - after installation of approx. 2 mio heat pumps
- Policy makers focus today on imagined 1 mio. electric cars which are supposed to have similar effect

Smart Grids Solution by OCHSNER

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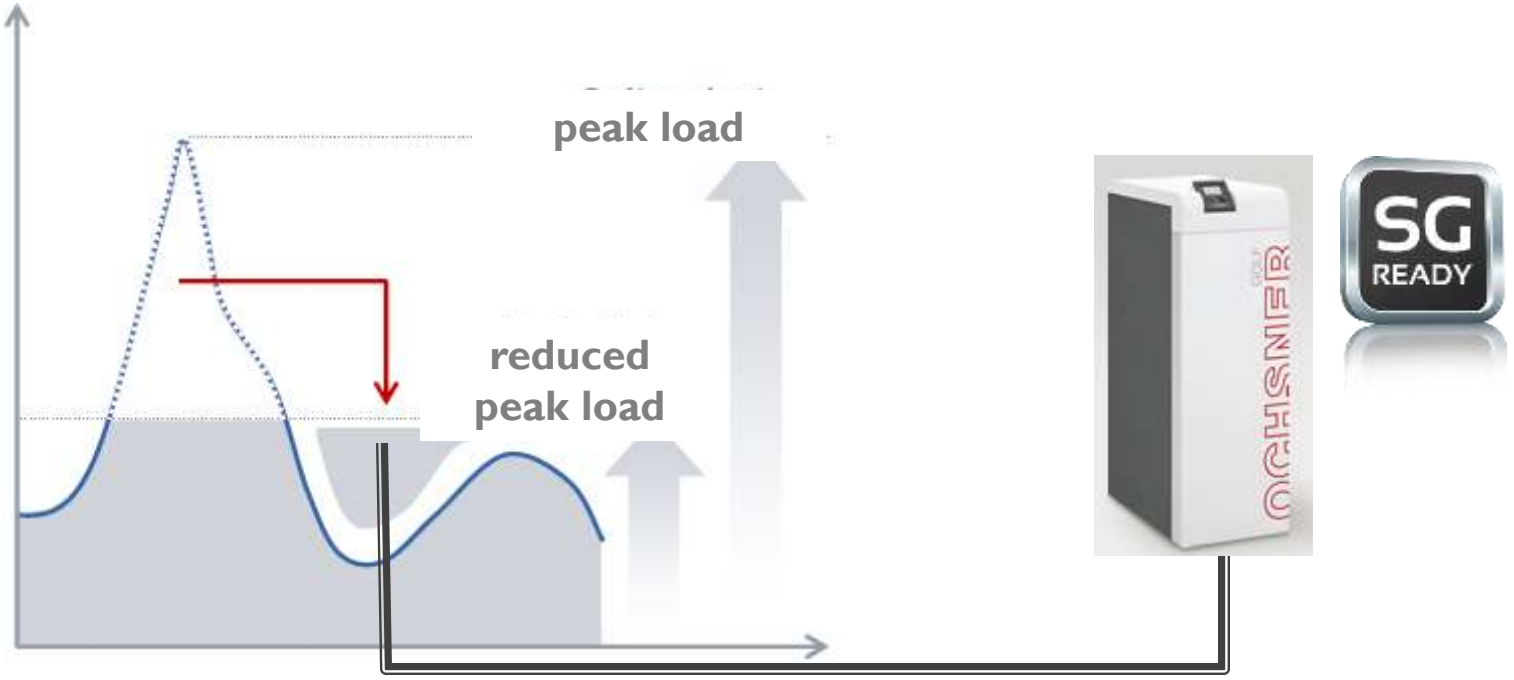
- Shift of load peaks
- Control of the power consumption



*** Siemens energy**

Smart grid – requirements on site

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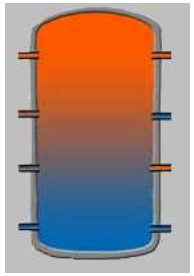
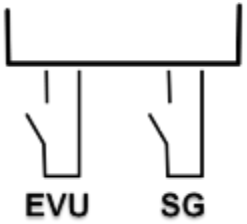


System

Buffer tank to store heat over a period

Heat pump

Power consumption → high COP, high supply temperature (65°C)



Controller

Hard – Software / Data processing

Ochsner types of heat pumps

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» **Heat pumps with screw compressor**

→ 120 kW - 1MW

→ Max. 65° C Flowtemp.

» **Heat Pumps with turbo compressor**

→ 270 – 370 kW

→ Max. 55° C Flowtemp.

» **High temperatur heat pumps**

→ 190 – 750 kW

→ max 98° C Flowtemp.

High temperature heat pumps

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» **Two stage maschine 190 - 750 kW**

→ old heating systems, industrial use …

→ 98° C max. flowtemp. (at a source of 10° C))

» **One stage maschine 60 - 640 kW**

→ for processes of the chemie-, food-, drinks industrie,
powerplant and district heating

→ 98°C max. flowtemp. (at a source of 35°C - 55°C)

Best applications with highest efficiency

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- Waste water use for heating and cooling
- Heating and cooling at the same time (best COP)
- Low temperature heat of industrial processes

Stadtwerke Amstetten (Austria)

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- Commissioning: 2012
- Heat source: Water (waste heat)
- Type of heat pump: IWWS210ER2
- Type of compressor: screw, R134a
- Source temperature: 15° C
- Flow temperature: 45° C
- Heating rating: 228,2 KW
- Cooling performance: 185,6 KW
- COP / JAZ: 5,4 / 5,6
- CO2-reduction: 54 tons/year, 72 % compared to gas
- Reduction operating costs: ca. 20.000 €/year, 72 % compared to gas

Cooling of the heat source waste water through sewer heat exchanger: 0,34°C (K)
Builder: Stadtwerke Amstetten in cooperation with the Waste Water Association

Stadtwerke Amstetten (Austria)

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Vattenfall (Hamburg)

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- Commissioning: 2011
- Heat source: EDV Server room
- Type of heat pump: 2 x IWWT 400 ER2
- Type of compressor: Turbo, R134a
- Source temperature: 16 - 6° C
- Flow temperature: 35 - 45° C
- Heating rating: 2 x 360 kW
- Building constructed: 1966-1969
- BGF: 48.601 m²

The administration building has been supplied with district heating and cooling. The fraction of load that can be moved within the building will now be managed with two turbo-pumps.

Vattenfall (Hamburg)

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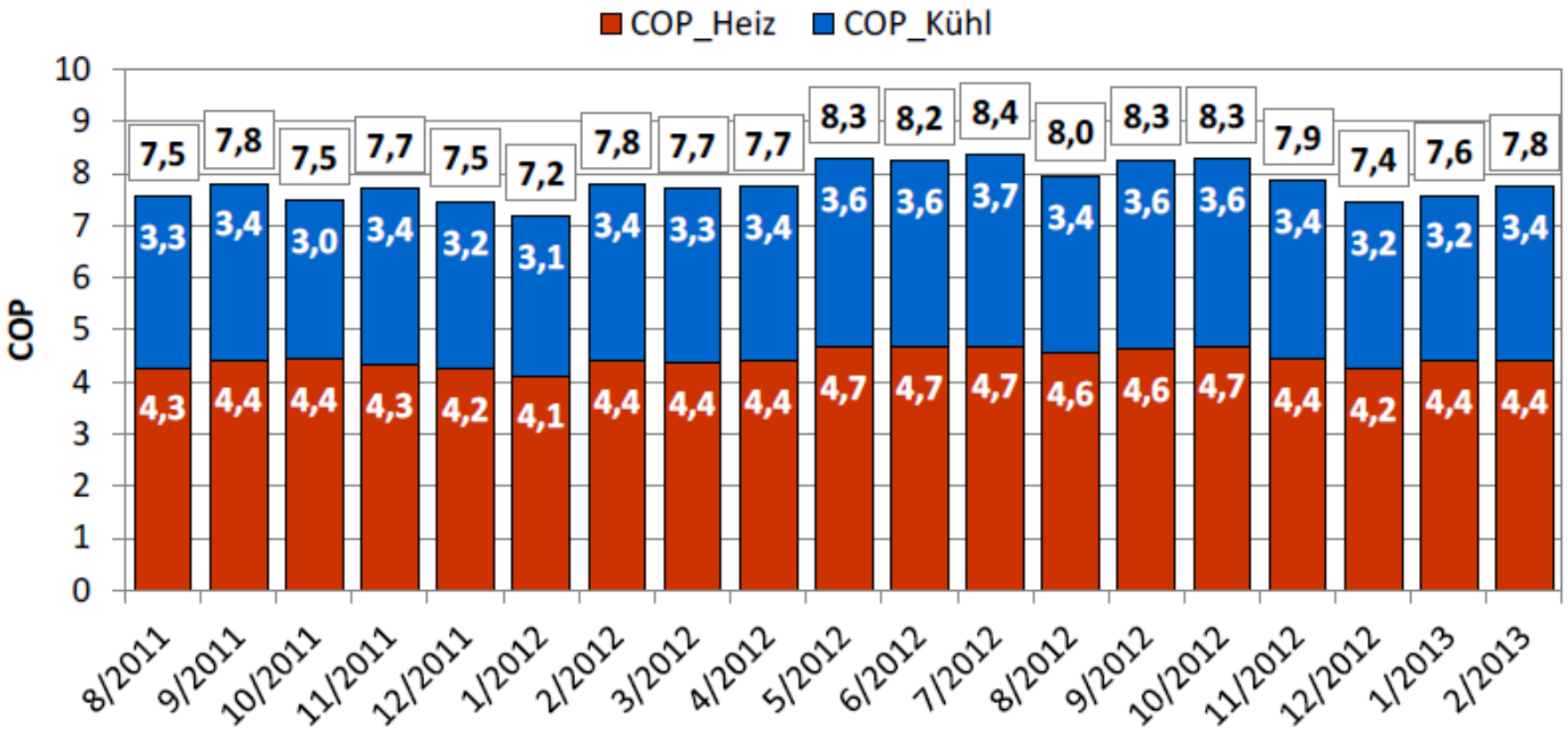

Vattenfall (Hamburg)

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Good results: August 2011 till August 2012 :

- COP_{heat} Ø = 4,46
- COP_{cool} Ø = 3,38
- $COP_{integrated}$ Ø = 7,84

With one unit of electrical energy, 7,8 units of heating and cooling can be produced

Powertower Linz

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Commissioning:	2008
Heat source:	ground water
Type of heat pump:	IWWS346ER2, IWWT400ER2
Type of compressor:	1 x screw, 1 x turbo, R134a
Source temperature:	10/6 ° C
Flow temperature:	35/30 ° C
Heating rating:	337,4 kW

The new Energie AG corporate headquarter is a masterpiece in terms of energy efficiency. Geothermal energy from 150m deep probes and two groundwater wells are used for heating and cooling.

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Thank you for attention

Questions?