

COOLING TOMORROW

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Workshop C

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District Cooling can considerably help Europe become a more Energy Efficient Society!

Ecoheatcool: Possible future for EU District Cooling

- 25 % market share for District Cooling by 2020
- 165 TWh annual supplies of District Cooling by 2020
- Investments in new DC infrastructure of 60 to 80 billion €
- 50 to 60 TWh of annual electricity demand can be eliminated
- 40 to 60 million tonnes of annual CO2 savings, which
- equals 10 - 15 % of 20/20/20 target
- The potential of natural and industrial cooling sources and cooling spills that are available exceeds the demand of a 25 % DC market share

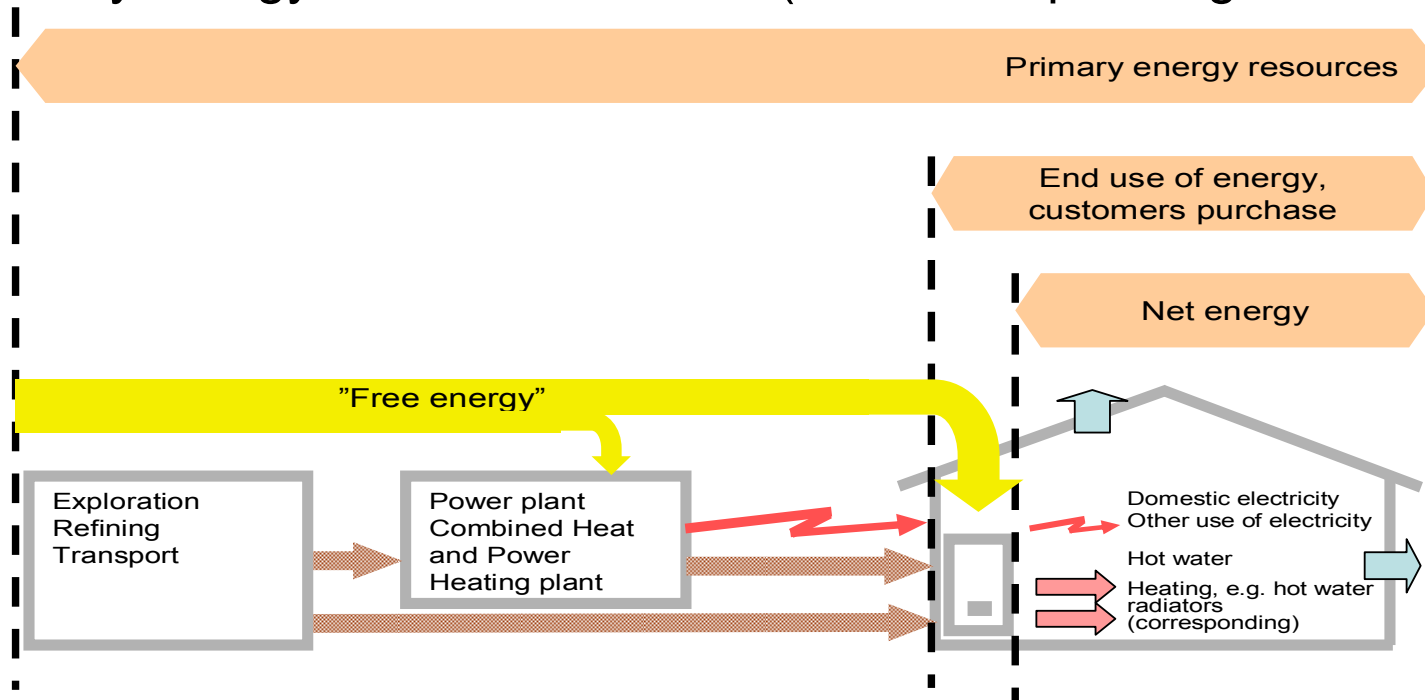
A System Analysis is necessary to understand the Improvement in Energy Efficiency

Example: Converting a building to District Cooling

Net Energy demand: Unchanged

Customers purchase of (End Use) Energy: Increased

Primary energy demand: Reduced (amount depending on source)



The Energy Efficiency of District Cooling

<i>Conventional building-bound solutions</i>	<i>EER*</i>
Conventional chillers in buildings	1.5 – 3
Conventional chillers combined with aquifers	3 – 6

<i>District Cooling solutions</i>	<i>EER*</i>
Industrial chillers with efficient condenser cooling	6 – 8
Combined District Cooling/District Heating	6 – 9
Free cooling / industrial chillers	8 – 25
Free cooling	25 – 40
Waste heat / absorption chillers	20 – 35

****EER = Cooling energy received / electric power input
Divide by 2,5 to get cooling energy received / primary energy input***

Sources: World Energy Congress 2004 and EU Sustainable Energy Week 2009

CONCLUSIONS

District Cooling based on Free Cooling *and/or*
Waste Heat is very efficient in saving Primary Energy

But also other District Cooling solutions can be
substantially more efficient than individual cooling

Investments in District Cooling replace investments
in generation and transmission of electricity
