



SOLAR HEATING PLANTS **(WG2E - ESTTP)**

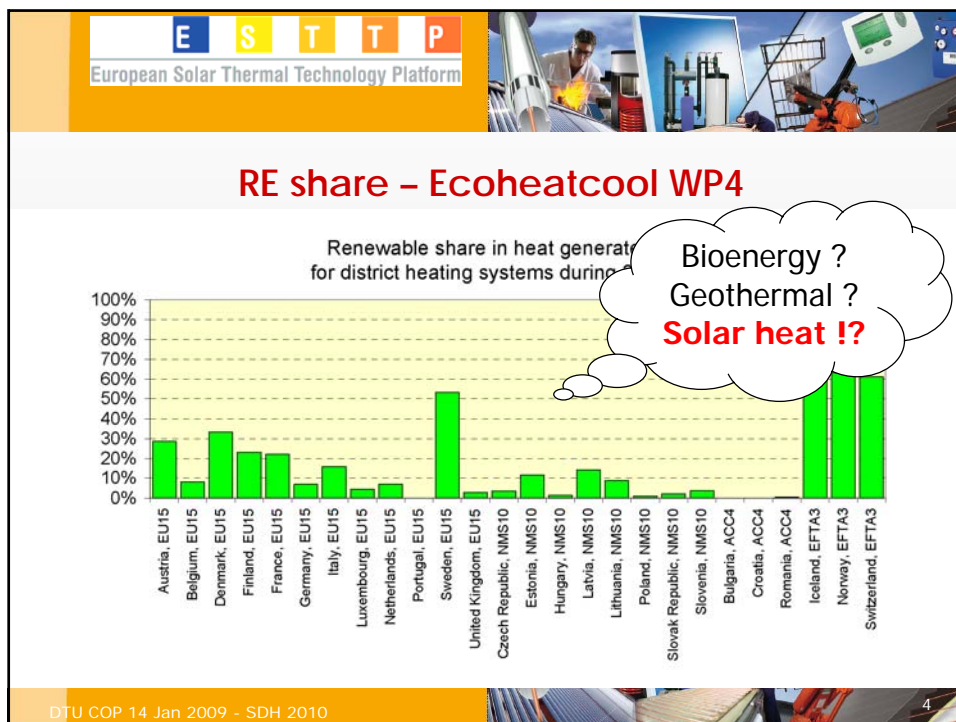
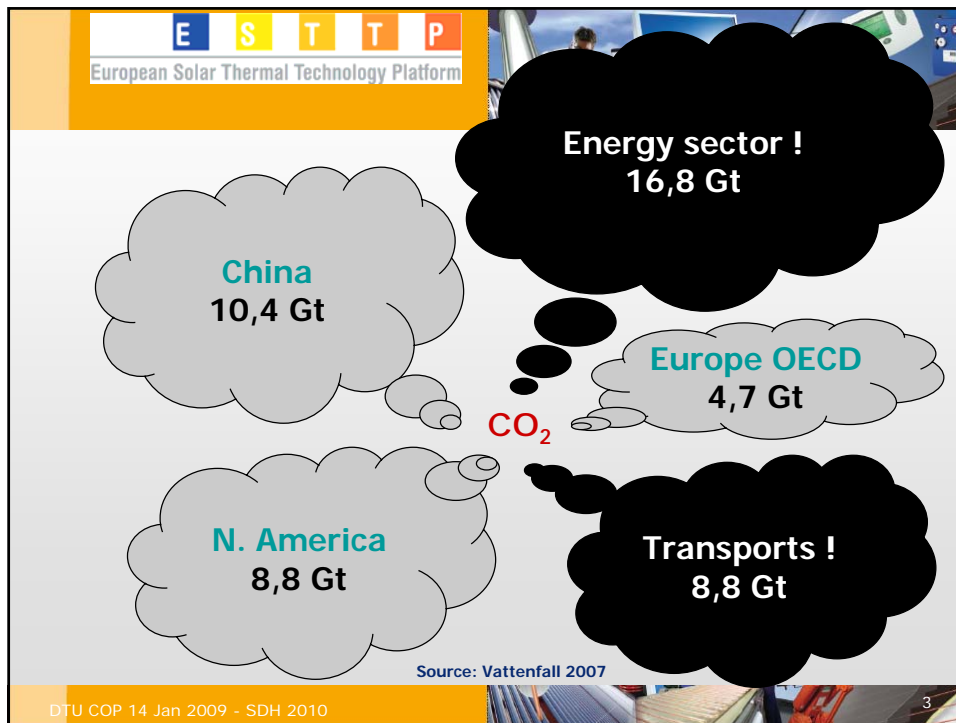
Jan-Olof Dalenbäck, CHALMERS, SE
Solar Thermal Technology Panel
Renewable Heating and Cooling
Energy Technology Platform (RHC-ETP)
www.rhc-platform.org



**Professor in Building Services
Engineering (HVAC), CHALMERS**
Dept. Energy and Environment
Energy in buildings, industry & transport.
Electric (Wind power, EV), Energy (Bioenergy –
CHP, Fuels, CO₂). Physical resources, environ-
mental aspects and innovation systems

**Responsible for the evaluation of the
1st two SH plants built in 1979 and 1980**







SOLAR HEATING PLANTS

- Heating & Cooling ..
- Block and District heating plants for new and existing building areas ..
- Plants for new and existing large building complexes .. e.g. industries, hotels, etc.
- Large-scale systems
> 500 m² or > 350 kW_{th}



Collector mounting for a Solar Cooling Plant in Qingdao, China, 2006



VISION

“Solar generated heat makes a considerable share (>10%) of the heat generated for block and district heating systems in Europe”

1% would be feasible within 10-20 years ?!

10 % would require seasonal stores ..!?





SWOT

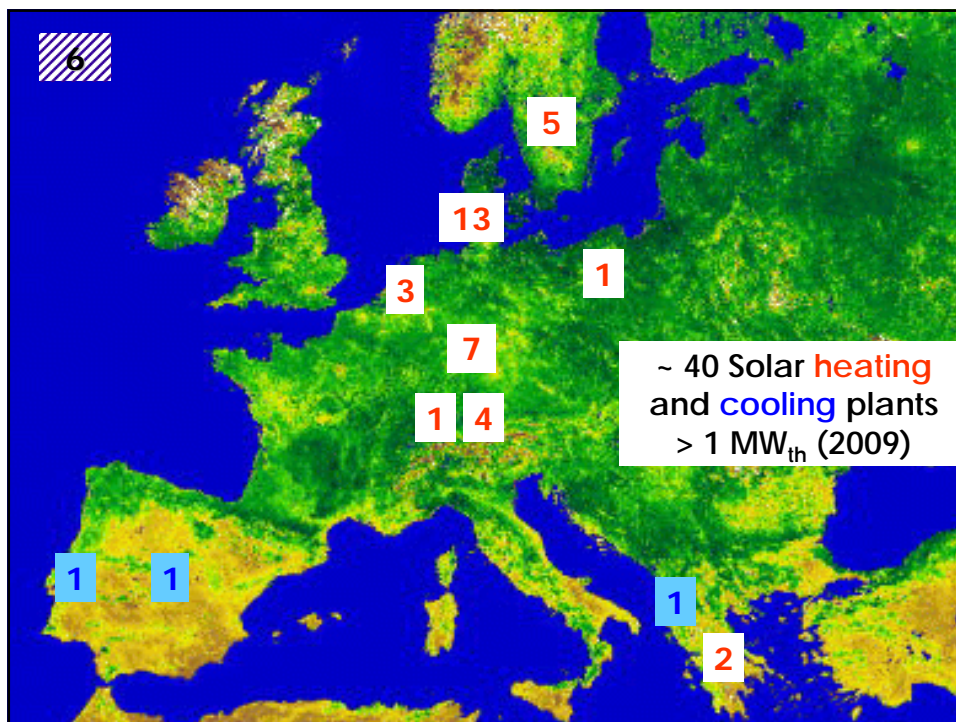
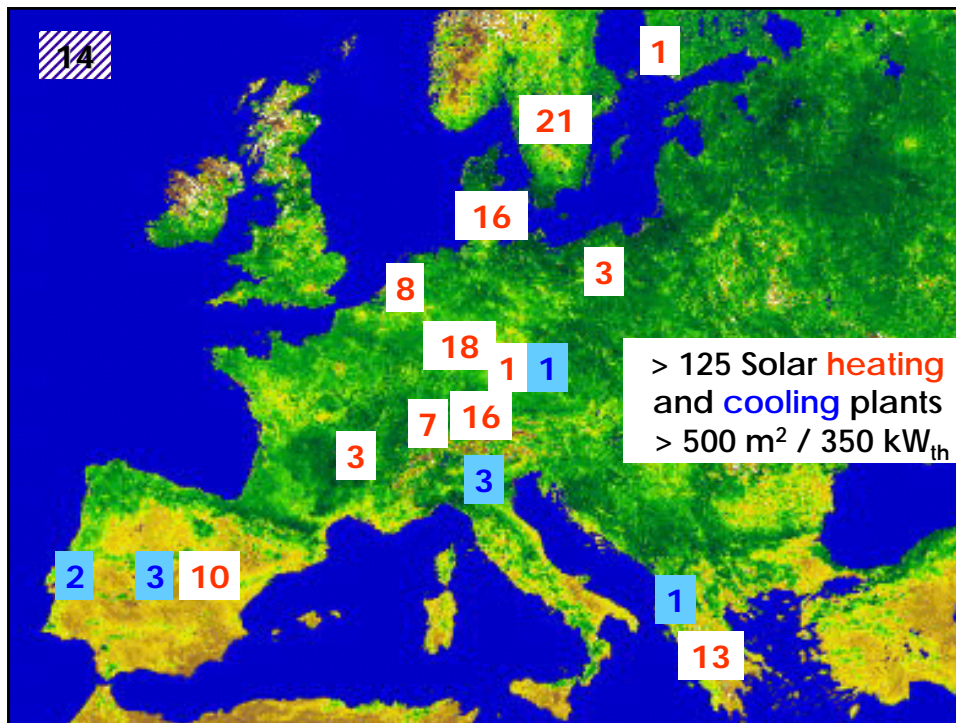
- S: Renewable heat ... everywhere ...
- W: Low energy density ... Size / placing ...
(Bio fuels > 30 times the land area !!)
- O: RE district heat in villages and cities
New business opportunities ...
RE district cooling ... cooling function ..?!
- T: Lack of incentives, interest and knowledge ...
(policy, decision makers, utilities, etc.)
Gas networks ... waste heat ...

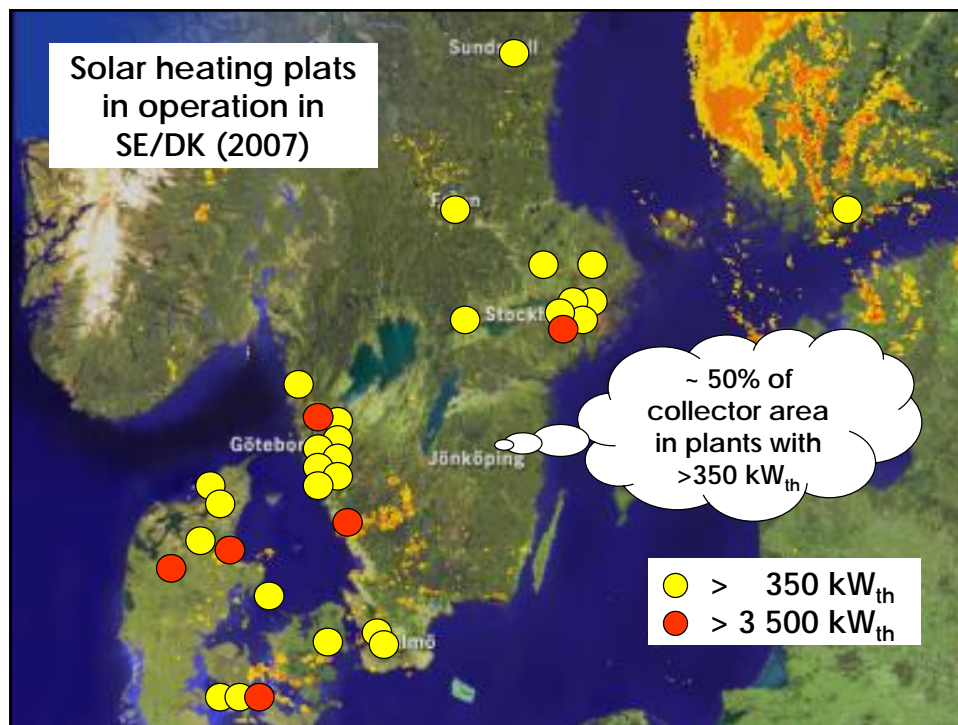


STATUS (2007)

- A small no of pilot plants ...
> 120 plants > 500 m² / 350 kW_{th}
Misc. solar heating and cooling plants ...
- > 30 plants > 1 MW_{th} / 1 400 m²
> 15 solar plants in district heating systems ...
> 10 large solar block heating plants ...
> 5 plants with (large) seasonal storages ...
> 5 solar cooling plants ...
- > 20 years operational experience ... but a small no
of specialized manufacturers and contractors ...









E S T T P

European Solar Thermal Technology Platform



Braedstrup – 8 000 m² – 5.6 MW_{th} - 2007



DTU COP 14 Jan 2009 - SDH 2010



15

E S T T P

European Solar Thermal Technology Platform



Sweden ..



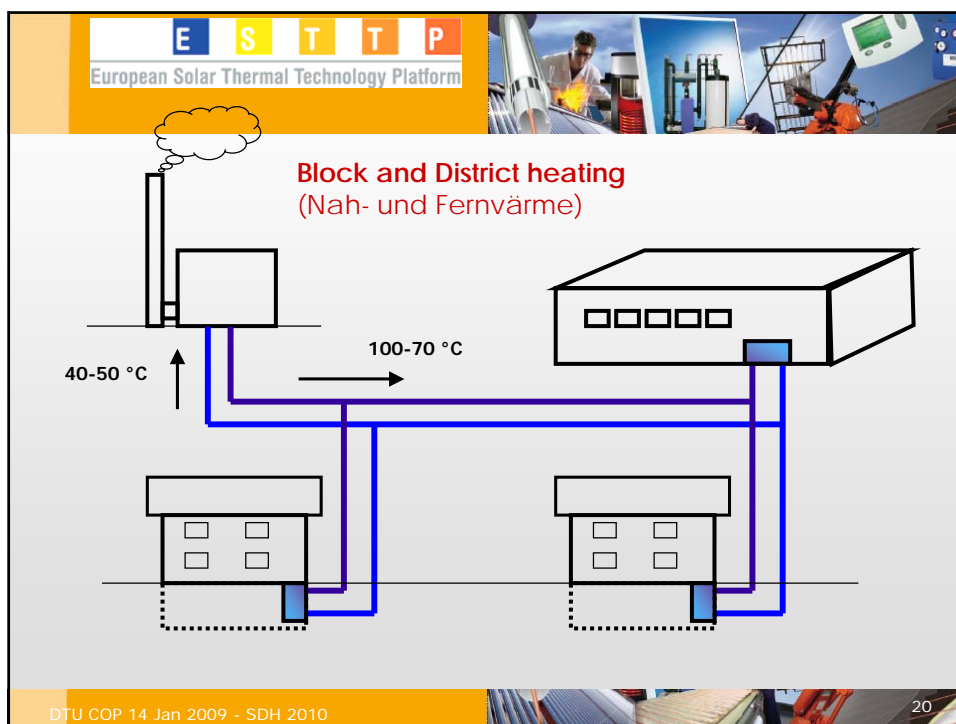
Kungälv - 10 000 m² ~ 7 MW_{th} - 2000
Combination with wood chips

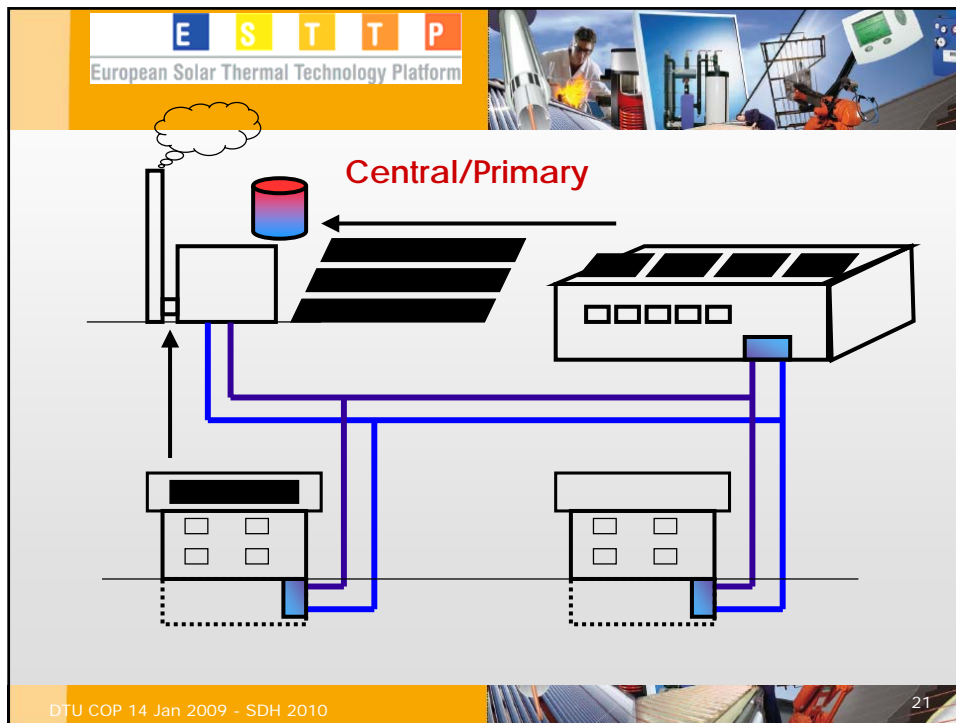
DTU COP 14 Jan 2009 - SDH 2010

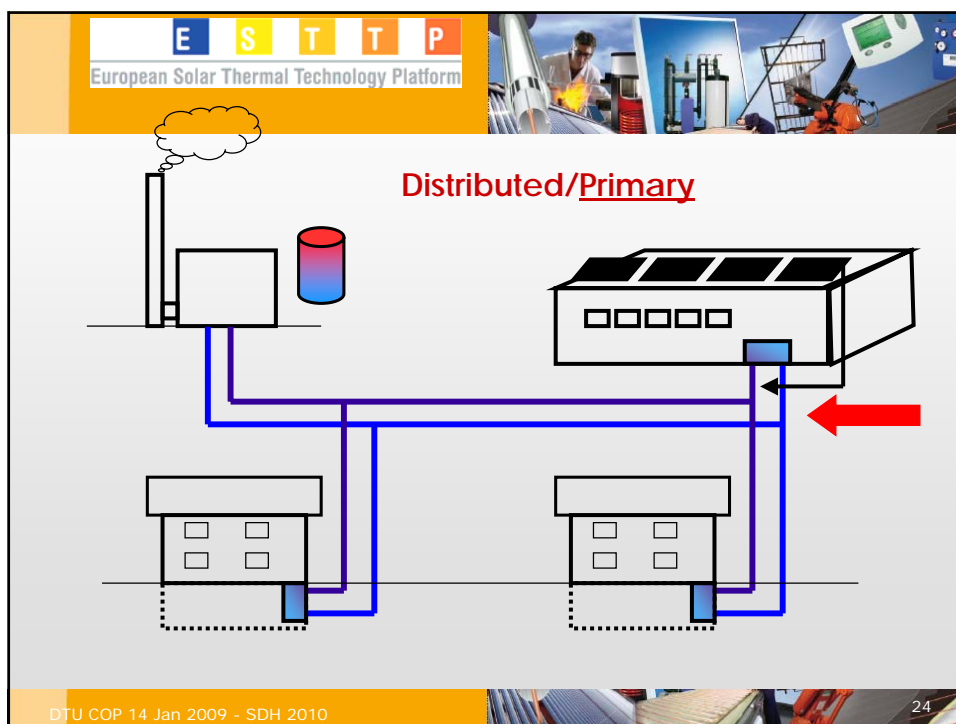
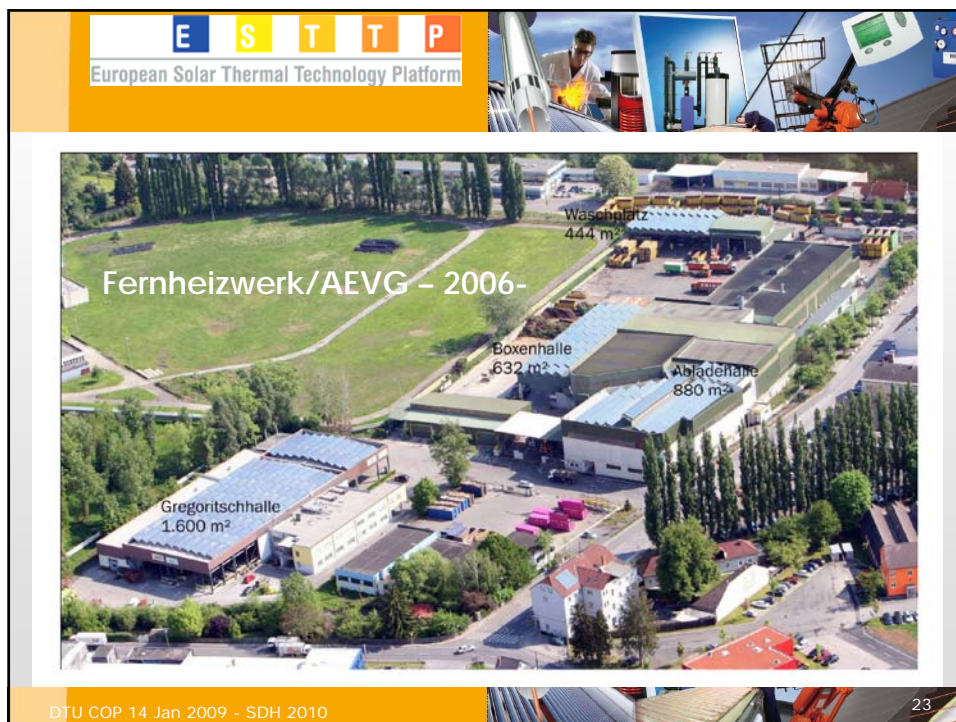


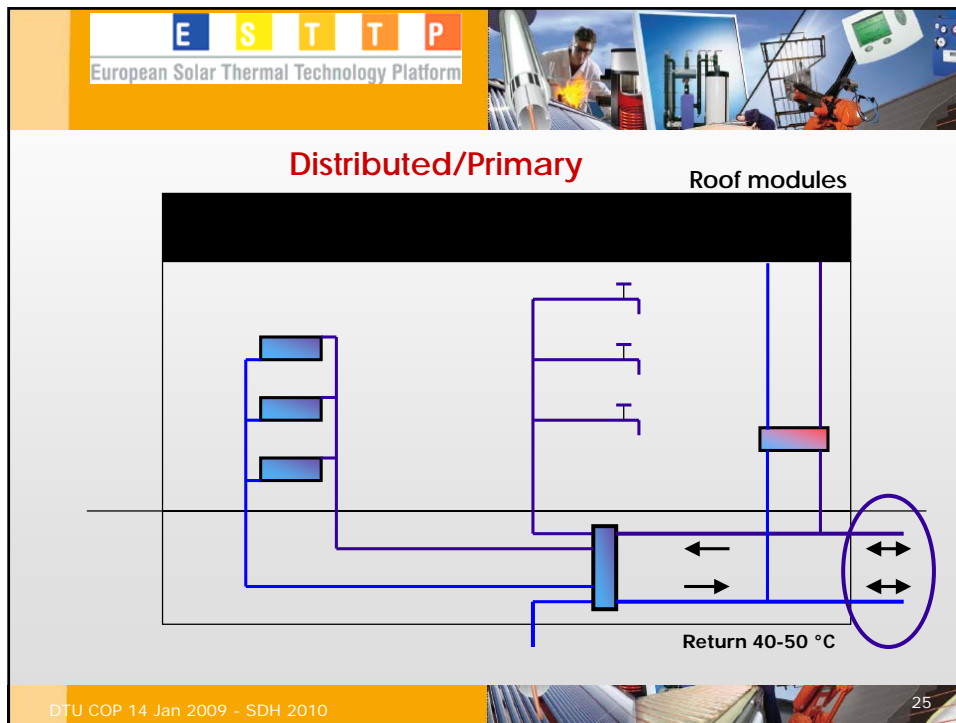
16













QUESTIONS ?

Jan-Olof.dalenback@chalmers.se

www.solar-district-heating.eu

www.rhc-platform.org

