



High Performance Solar Systems for district heating networks in Europe

Detlev Seidler, Ritter XL Solar GmbH, Germany 09/04/2013

Ritter XL Solar GmbH

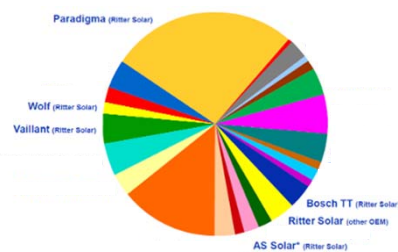
Vacuum Tube Collectors in Europe



Ritter is the German and European market leader in vacuum tube collectors:

⇒ Market share in Germany 46,1%

⇒ Market share in Europe 27,5%



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SDH-Governance, Wuppertal, 14. April 2013

Folie: 2

Ritter XL Solar



1988 <small>Gründung der Ritter Energie- und Umwelttechnik GmbH & Co. KG durch Alfred T. Ritter und Klaus Taafel.</small>	1990 <small>Start der Marke Paradigma</small>	1997 <small>Markteinführung der CPC-Vakuumröhren-Technologie in Deutschland</small>	2000 <small>Gründung der Ritter Solar GmbH & Co. KG als Produktkonföderation für Vakuumröhrenkollektoren</small>	2004 <small>Markteinführung AquaSystem</small>	2007 <small>Bau der bis dato weltweit größten Vakuumröhren-Kollektoranlage mit 1.330 m² Kollektorfläche bei der Firma Festo in Esslingen, Süddeutschland</small>	2008 <small>Erste direkte solare Einsparungen in vorhandene Wärmenetze ohne zusätzliche Speicher und ohne Wärmetauscher</small>	2009 <small>Eigene Marke „XL Solar“ für Solare Großanlagen</small>	2010 <small>Bau der bisher weltweit größten Vakuumröhren-Kollektoranlage mit 3.373 m² Kollektorfläche zur Einspeisung in das Fernwärmenetz der Stadt Wien, Österreich</small>
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- ⇒ Ritter XL Solar 20 years of experience in solar
- ⇒ Ritter XL Solar 6 years of successful implementation of the AquaSystem
- ⇒ Ritter XL Solar more than 200 large scale systems installed



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Folie: 3

The CPC vacuum tube collector



... the high end solution at a reasonable price.
Made in Germany

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Folie: 4

Water As Heat Transfer Fluid ...

- **Long-term** constant, ensures a long operational lifetime
- High temperature resistant
- Eliminates all risks of thermal stagnation
- Guarantees long-term high efficiencies
- **Best performance** parameters
- Allows **direct integration into existing systems**
- Reduces the number of components needed
- **Environmentally-friendly**
- **Cheap**

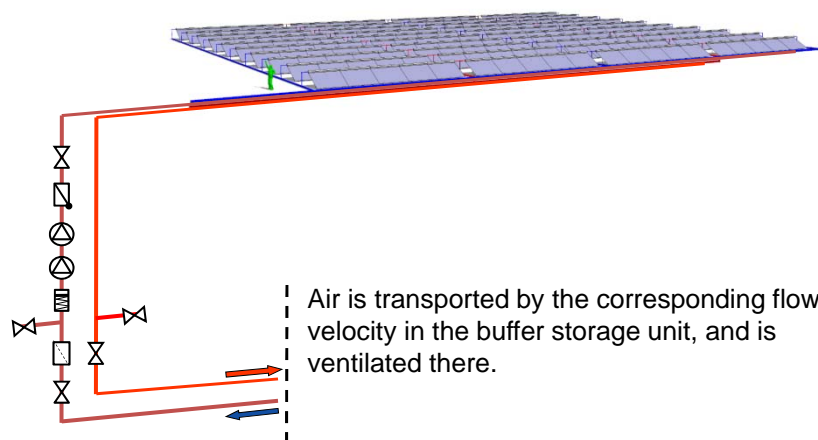


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Simple but reliable system design

- ⇒ **No armatures within the field itself**
this means easy start up and low maintenance



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Folie: 6

Summary: Highlights of XL - System



No Glycol

The solar system works like an additional boiler, all advantages of water can be used.
Low maintenance costs, no degradation.

All year constantly high hot water temperatures possible up to 120° C

Especially suitable for district heating and process heat

Very simple and reliable system

No air vents or valves within the solar field,
automatic functional checks by the controller.



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Folie: 7

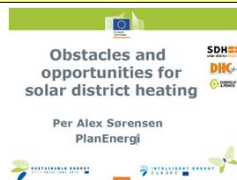
State of the art solar systems



What does this mean for the customers ???



There are various obstacles left, but :
Return temperatures up to 95° C are no longer a problem !



Obstacles in Germany

.....

High return temperature

Obstacles in Czech Republic

.....

High return temperature

Obstacles in Italy

.....

High return temperature

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District Heating Wels, Austria

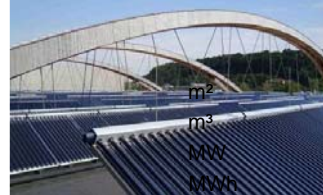


Support for the district heating network since May 2011

(largest vacuum tube system in European district heating,
number 3 of the largest installations in Austria)

Temperature 8095 ° C

Gross collector area	3.388
Buffer tank volume	3
Max. continuous power	1,7
Yield / Year	1.300



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Folie: 9

Monitoring results Wels / Austria

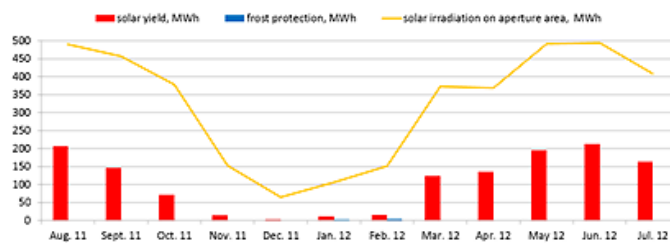


Figure: measured performances of the Wels plant over a year

⇒ ASiC :

**“Now monitoring results are available attesting
excellent performance of the installation.”**

<http://www.solar-district-heating.eu/Default.aspx?tabid=68&ArticleId=218>



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Folie: 10

Energy bunker Hamburg

Inclination	15° (due to wind load and available roof space)
Gross collector area	1.348 m ²
Yield per year	600 MWh



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Folie: 11

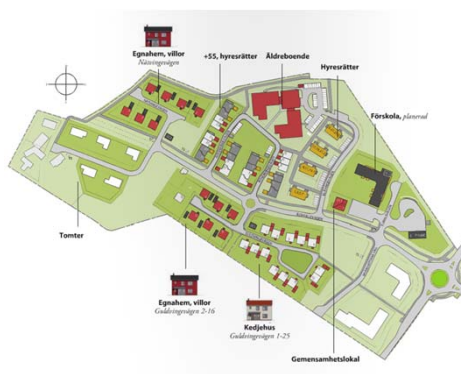
....coming up next: Sweden, 5 / 2013

Show case installation at Vallda Heberg (120 m² of ETC)

The goal of this project is that almost half of the energy will be solar.

The solar panels are spread across 8 facilities totaling 700 m².

The Ritter XL system is mounted on the wall of the central heating station.



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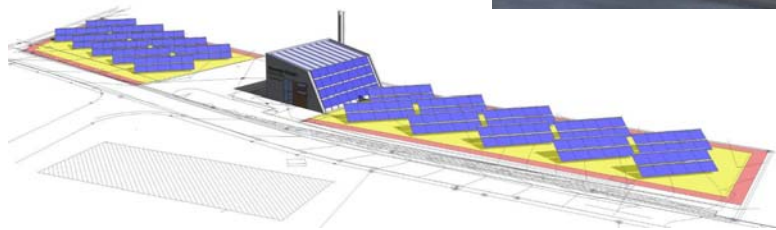
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..coming up next: Büsingen, 6 / 2013

Solar support for the biomass district heating system

temperature	80...85 ° C
Gross collector area	1.090 m ²
Buffer tank volume	100 m ³
Yield / Year	545 MWh



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Folie: 13

High Performance Solar Systems for DHN

Performance of solar thermal systems

- **Different testing methods in different markets**
Testing measurements only describe the collector performance driven with water for small systems
- **System Yield = Collector Yield**
 - Heat loss piping
 - Heat loss storage tank
 - Start up losses (especially in the mornings)
 - For Aqua System: Frost protection

→ **Ritter guarantees a Solar System Yield!**

Economics of solar thermal systems

- The investment for the complete system including the buffer has to be considered, not only the collectors.
Product guarantees instead of maintenance costs.

→ **Heat price at a certain solar fraction**

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Folie: 14

Thank you for your attention !!

Nothing is more powerful than an idea whose time has come.

Victor Hugo



Now the time has come for high efficient solar systems all over Europe