



**High Performance Solar Systems for district heating networks in Europe**

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

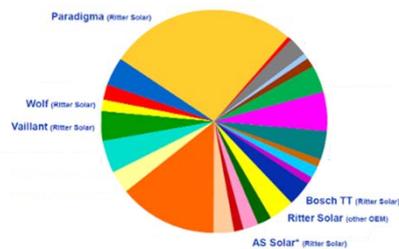
Ritter XL Solar GmbH

**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 - Solar District Heating, www.sdh.de, 09/04/2013

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# Ritter XL Solar



- 1988 Gründung der Ritter Energie- und Umwelttechnik GmbH & Co. KG durch Albert T. Ritter und Klaus Taafel.
- 1990 Start der Marke Paradigma
- 1994 Erste solarthermische Großanlagen von Paradigma
- 1997 Markteinführung der CPC-Vakuumröhrentechnologie in Deutschland
- 2000 Gründung der Ritter Solar GmbH & Co. KG als Produktionsfirma für Vakuumröhrenkollektoren
- 2001 Joint-Venture mit der Linuo Gruppe in Jiang/China, unter dem Namen Linuo Paradigma
- 2004 Markteinführung AquaSystem
- 2007 Bau der bis dato weltweit größten Vakuumröhren-Kollektoranlage mit 1.333 m<sup>2</sup> Kollektorfläche bei der Firma Festo in Eslingen, Süddeutschland
- 2008 Erste direkte solare Einsparungen in vorhandene Wärmereiche ohne zusätzliche Speicher und ohne Wärmetauscher
- 2009 Eigene Marke „XL Solar“ für Solare Großanlagen
- 2010 Bau der bisher weltweit größten Vakuumröhren-Kollektoranlage mit 3.373 m<sup>2</sup> Kollektorfläche zur Einspeisung in das Fernwärmenetz der Stadt Wien, Österreich

- ⇒ 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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# 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**

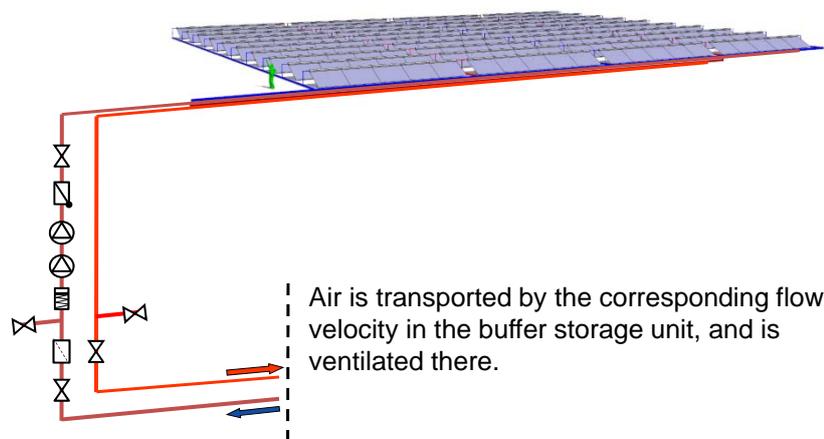


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## Simple but reliable system design

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



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## 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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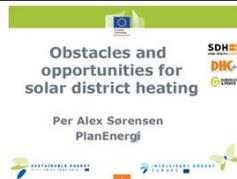
## State of the art solar systems



### 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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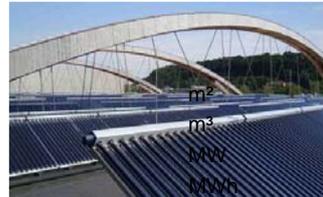
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## District Heating Wels, Austria



**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)

<b>Temperature</b>	<b>80 ....95 ° C</b>
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

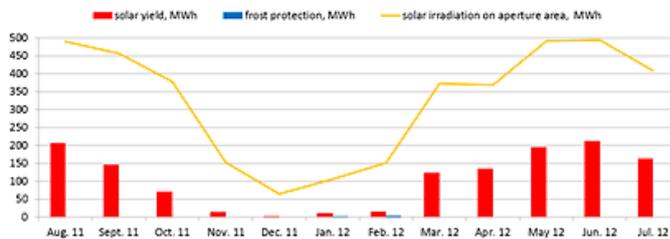


Figure: measured performances of the Wels plant over a year

⇒ 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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## Energy bunker Hamburg

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



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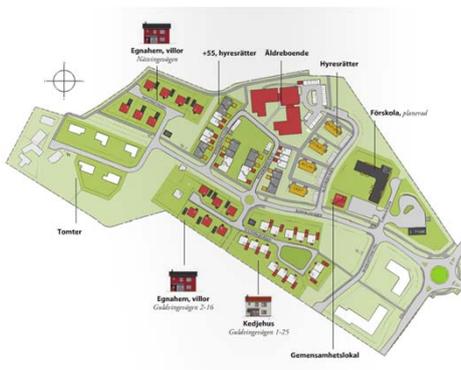
## ....coming up next: Sweden, 5 / 2013

### Show case installation at Vallda Heberg (120 m<sup>2</sup> 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 m<sup>2</sup>.

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



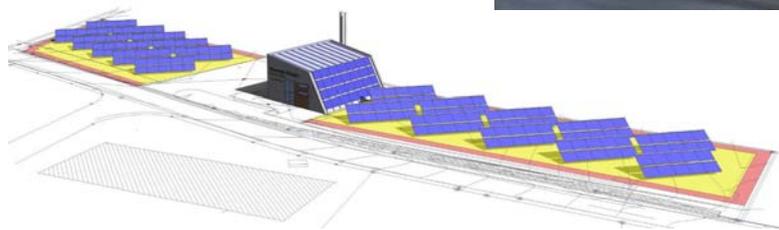
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### Solar support for the biomass district heating system

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



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### 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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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*