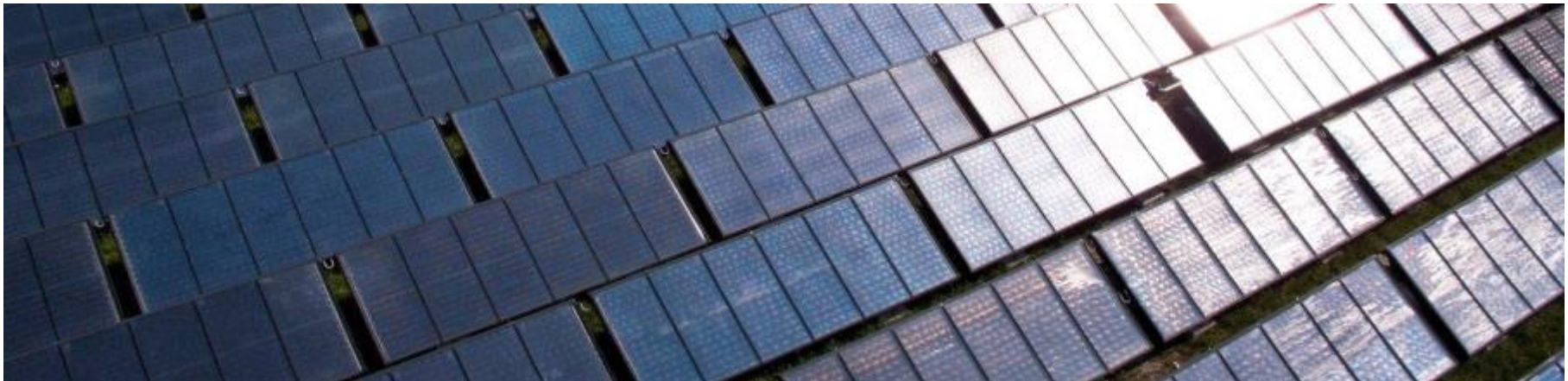


# SOLID Solar thermal systems: SHIP - Solar Process Heat for Industry

Since 1992

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Christian Holter  
2020

# SOLID - more than hot water



Headquarter in Graz, Austria

Subsidiaries in Germany, USA &  
Singapore

Partners in many other countries

Around 300 reference plants  
around the world



Solar district heating



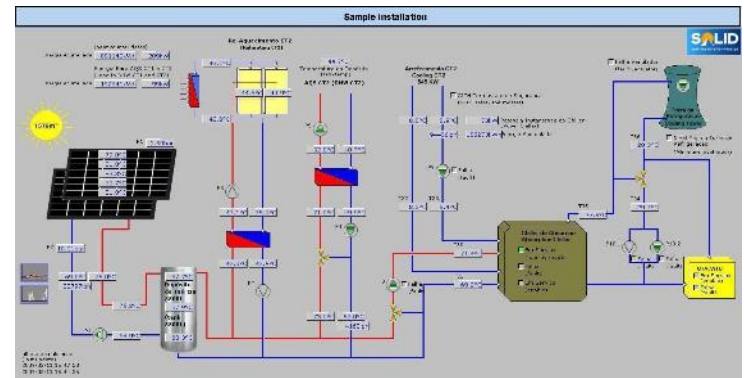
Solar heat for industrial processes



Solar cooling and domestic hot water

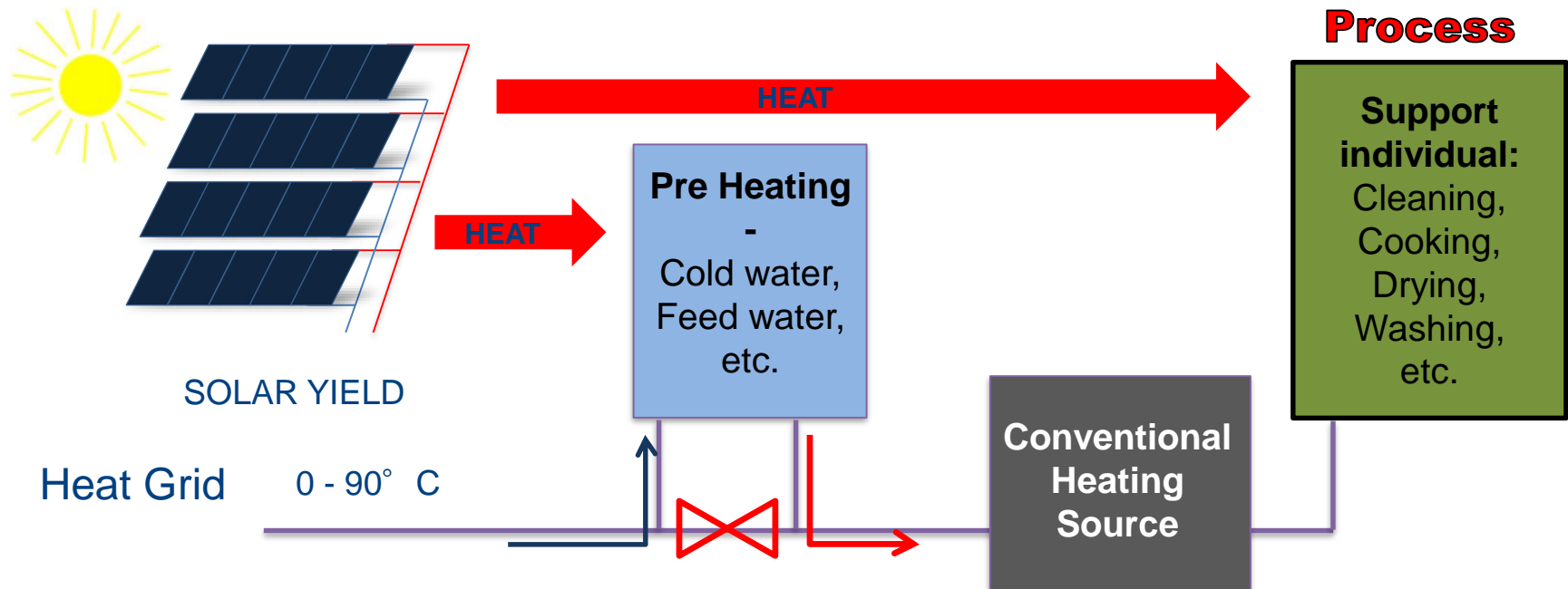
## Turn-key solutions for large-scale solar thermal sytems (> 1 MW)

- Engineering and plant construction
- Energy Service Company (ESCO)
- Research & developement
- Consulting Services



# Preheating is the simplest solution

- Heat up to 120°C
- Either directly to the individual process or within a network of heat exchangers
- Constant pre-heating at temperatures below e.g. 60°C delivers the best techno-economic results





# Gatorade (Pepsi Cola) Phoenix , AZ



Preheating production water for the soft drinks before the reverse osmosis plant.

Storage: 38 m<sup>3</sup>

2008: 893 m<sup>2</sup>

2010: upgrade to 2600 m<sup>2</sup>

2012: upgrade to 3700 m<sup>2</sup>

Next step to integrate Solar Heat in the pasteurization in planning phase today



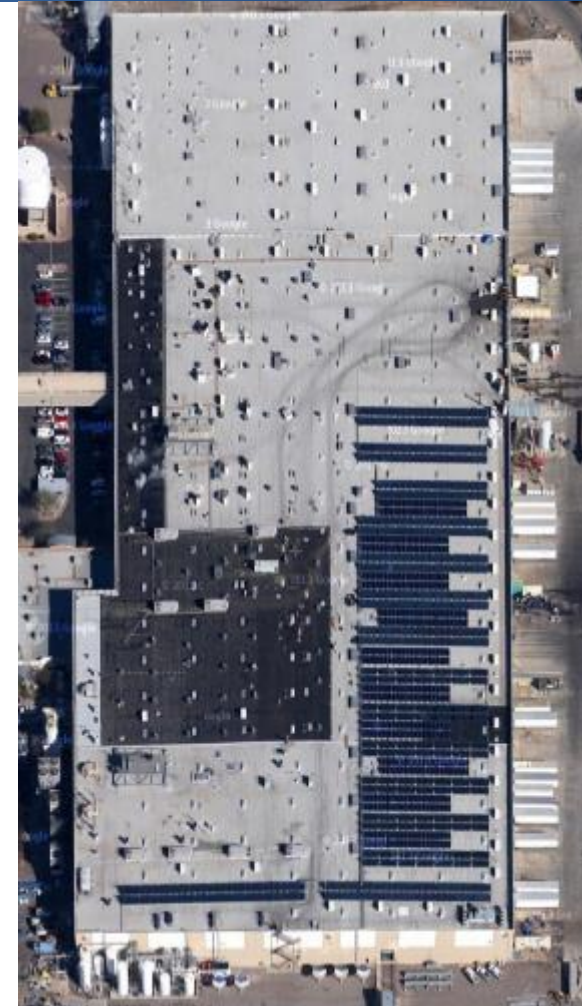
# Gatorade (Pepsi Cola) Phoenix , AZ



2009



2011



2012

© Google Earth

# Overview – Selected References of SOLID



Name	Collector array, m <sup>2</sup>	Status
Körner KVK Wies	86	In operation since 2007
Wine producer Peitler	100	In operation since 2003
Gatorade, Phase 1	893	In operation since 2008
Gatorade, Phase 2	2600	In operation since 2010
Gatorade, Phase 3	3770	In operation since 2013
Stonyfield dairy	3118	Engineering study
CB Chicken Slaughtery	1050	Engineering study
Meat factory Berger	1068	In operation since 2013
AVL List GmbH	1500	In operation since 2017
	1800	Ongoing extension



AVL List LLC., is an Austrian company international known for development of engine systems.

## Targets

- Reducing consumption of Heat sourcing from Natural Gas at cost below district heating
- Having a roof on the parking garage preventing snow and heat impact
- Need for Storage tank to balance solar energy between supply and demand

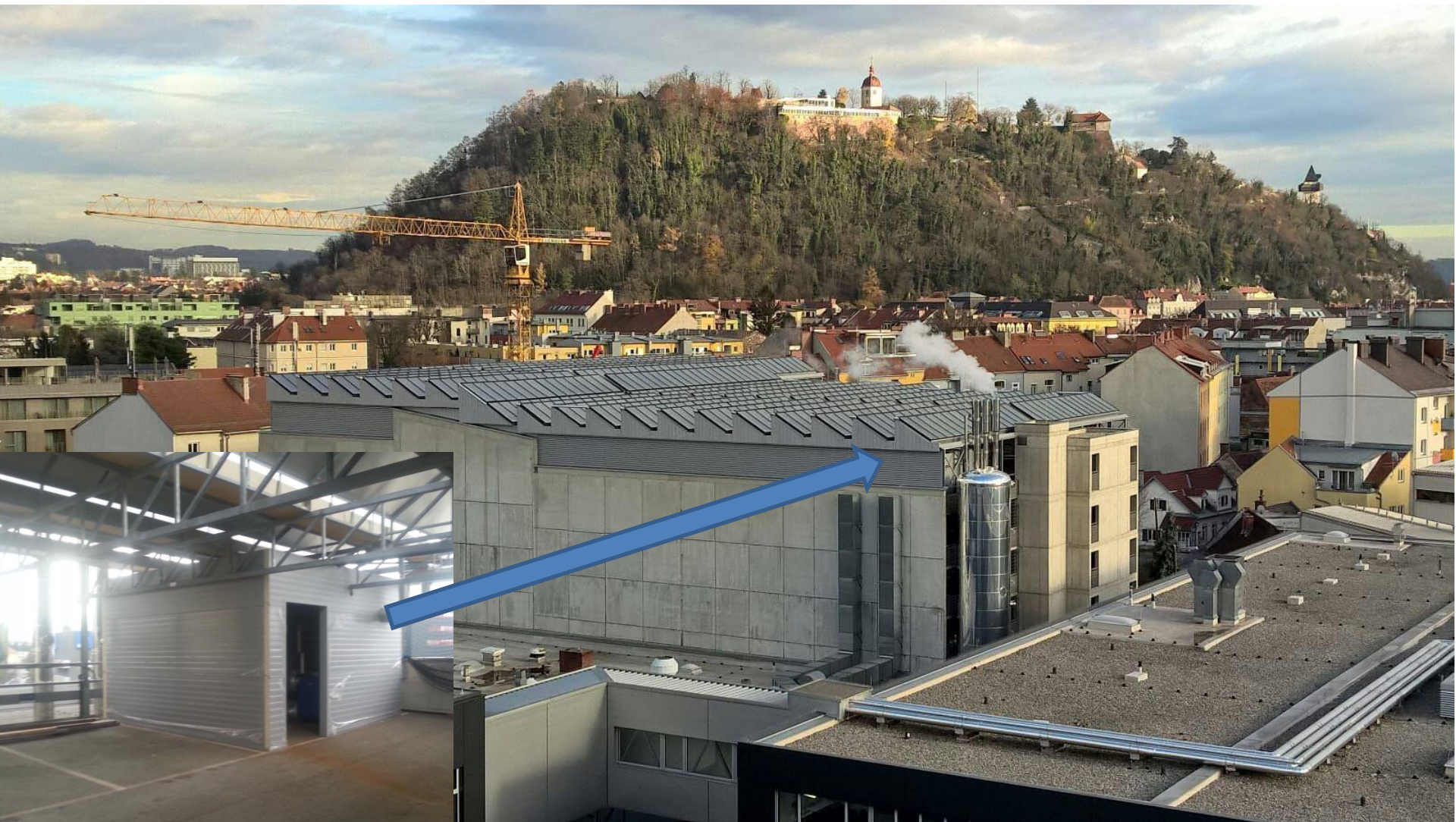




# Solution

- The 1584 m<sup>2</sup> solar thermal plant provides heat for conditioning regulators and building's heating systems
- ESCO
- Installed capacity: 1100 kW nominal
- Solar yield: 550 MWh/year
- Ca. 240t of CO<sub>2</sub> savings per year.
- Commissioning: 2017



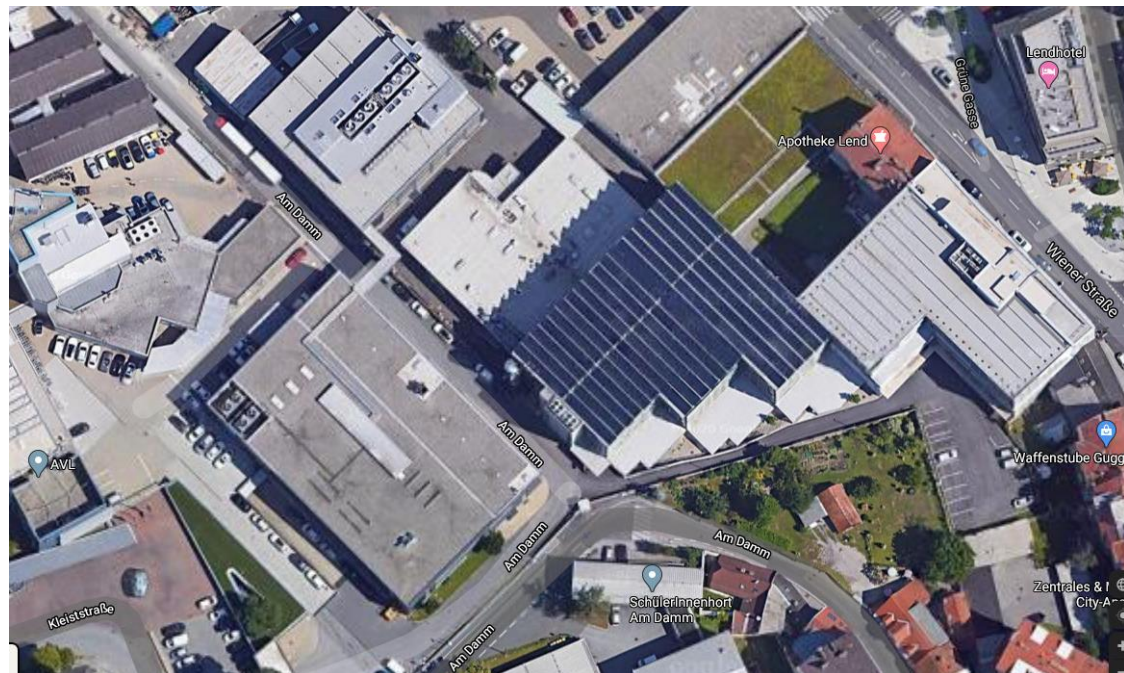


- Targets Phase I
  - Reducing consumption of Heat sourcing from Natural Gas at cost below district heating
  - Having a roof on the parking garage preventing snow and heat impact
- Limitation by summer demand on heat

## Is this all solar industry can do?



- Further Options
  - Many more roofs
  - Potential use of waste Heat
  - Strong increasing need of Cooling
  - Need of redundancy in the cooling





- Further Options

- Many more roofs
  - Potential use of waste Heat
  - Strong increasing need of Cooling
  - Need of redundancy in the cooling
- ➔ 2043 m<sup>2</sup> more solar
  - ➔ using solar storage
  - ➔ adding an AHP heat driven Cooling

## ➔ Phase 2

- Increased energy efficiency/waste heat integration
- Extended potential for solar heat through serving heating & cooling
- Peak management

**Just under implementation**



# Thank you for your attention!



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