

MW scale industrial solar cooling and heating with a heat purchase agreement



SOLID
solar energy systems

May 2023, Christian Holter

AVL List GmbH

With more than 11,500 employees, **AVL List GmbH** is the world's largest independent company for the development, simulation and testing of all types of powertrain systems (hybrid, combustion engine, transmission, electric drive, batteries, fuel cell and control technology), their integration into the vehicle and is increasingly taking on new tasks in the field of assisted and autonomous driving as well as data intelligence.

Our Vision and Mission

Clean. Affordable. Connected. Intelligent.

We as AVL provide leading technologies and superior services to our customers to create a better world by driving mobility trends of tomorrow.



Solar project Phase I

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 m² solar thermal plant provides heat for conditioning regulators and building's heating systems
- ESCO- Investor Solar.Nahwaerme.-energiecontracting GmbH
- Installed capacity: 1100 kW nominal
- Solar yield: 550 MWh/year
- Ca. 240t of CO₂ savings per year.
- Commissioning: 2017



Benefits 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

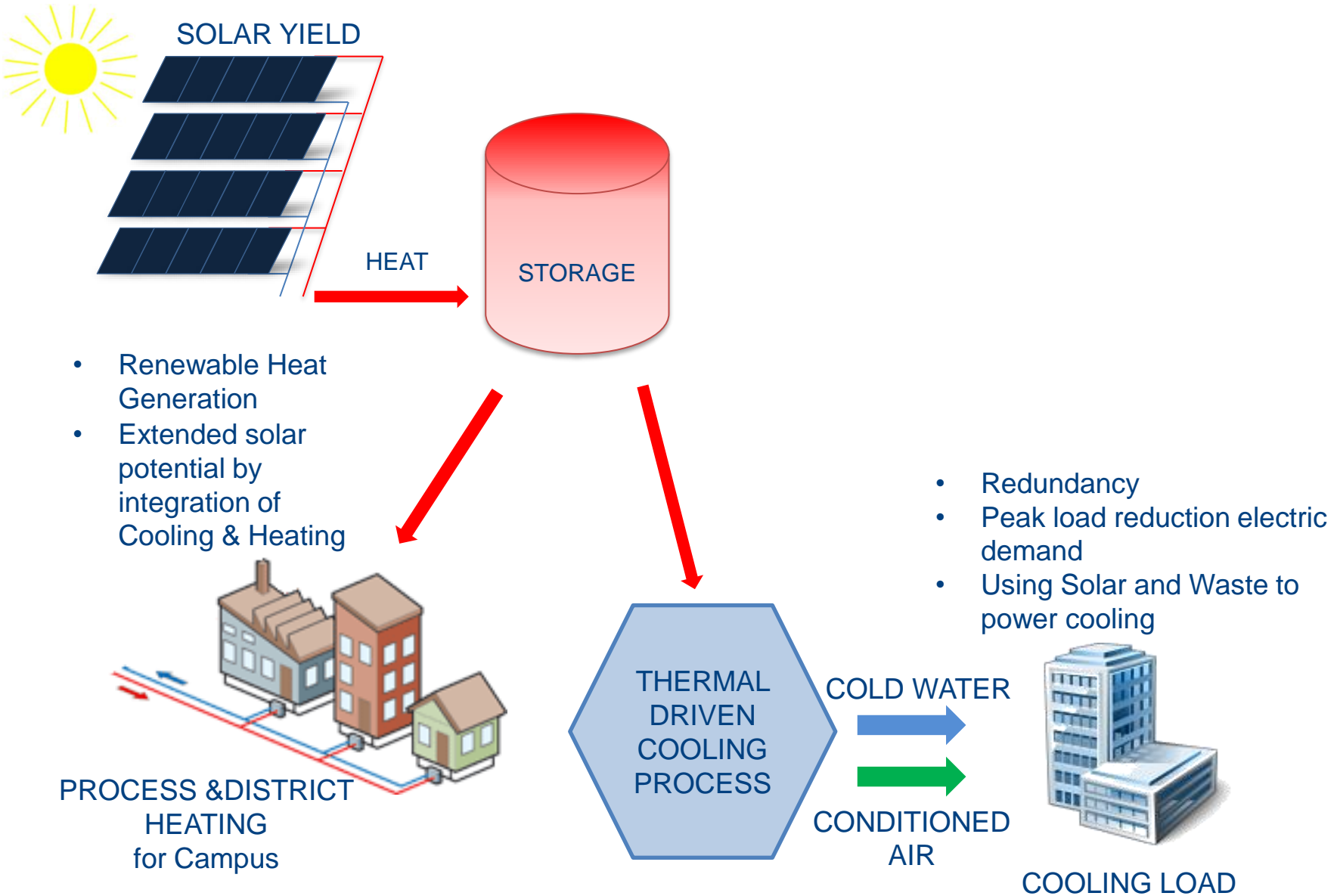
Is this all solar industry can do?

Further Options and Demands

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



Smart system integration

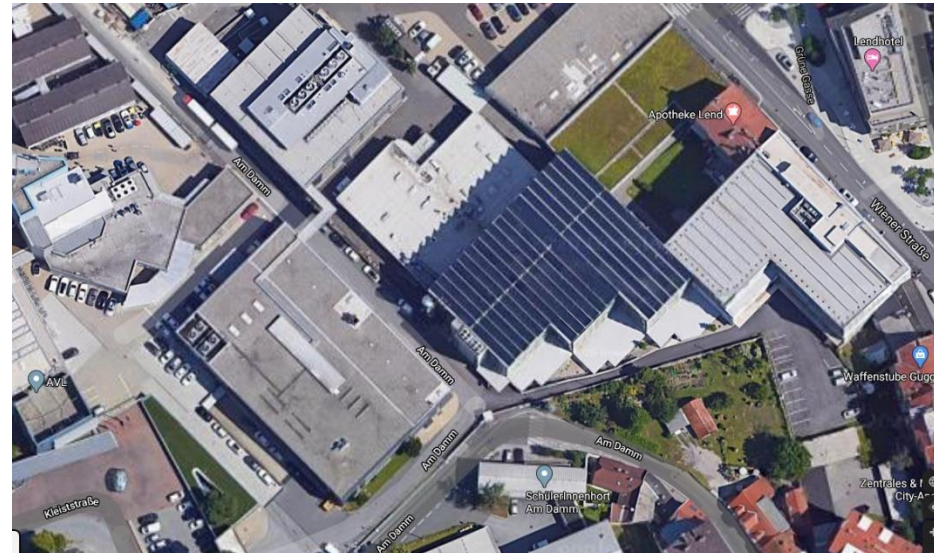


Smart integration- solution

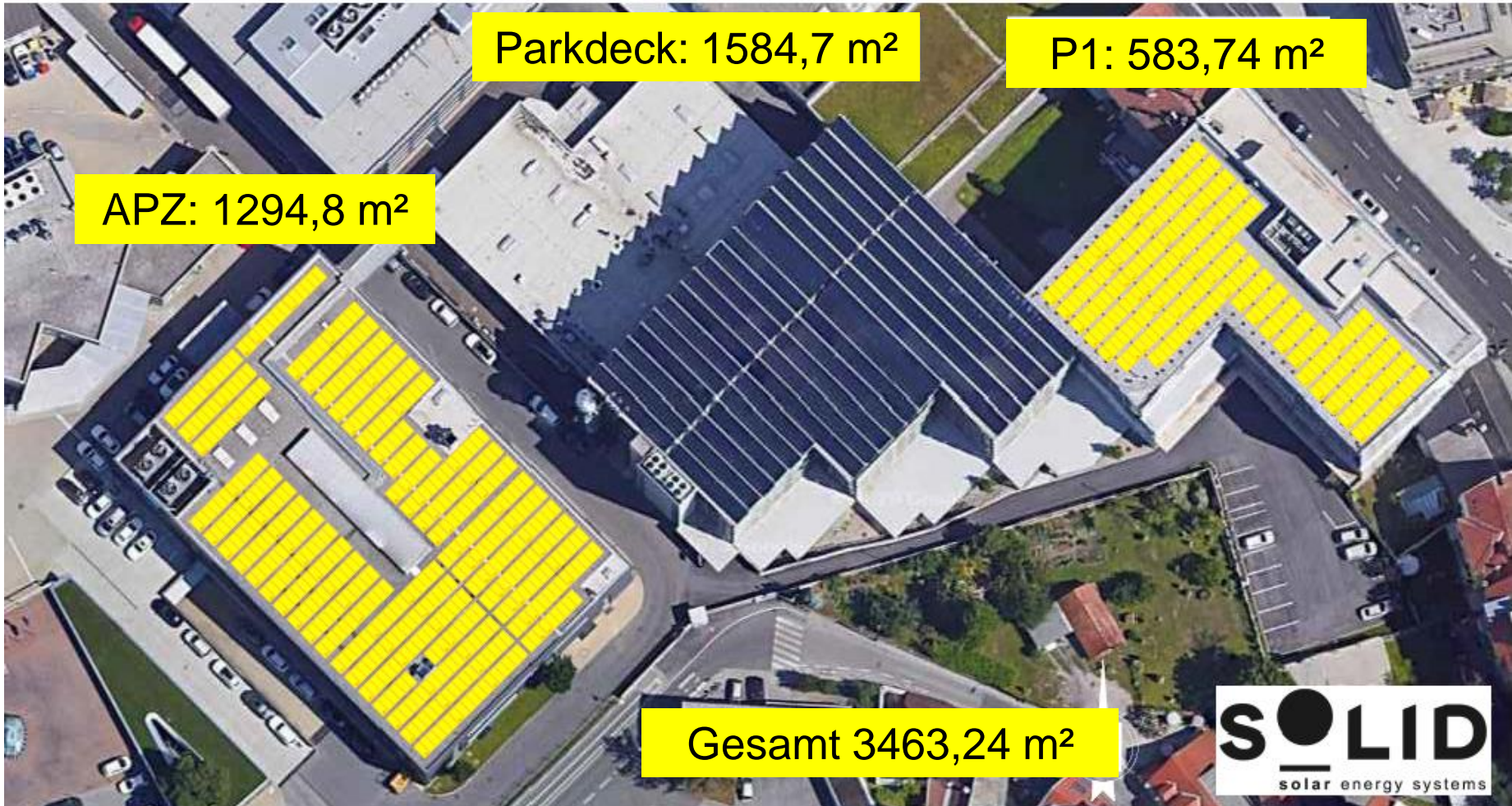
- Many more roofs
- Potential use of waste Heat
- Strong increasing need of Cooling
- Need of redundancy in the cooling

- ➔ 1878,54m² more solar
- ➔ using solar storage
- ➔ adding an AHP heat driven Cooling

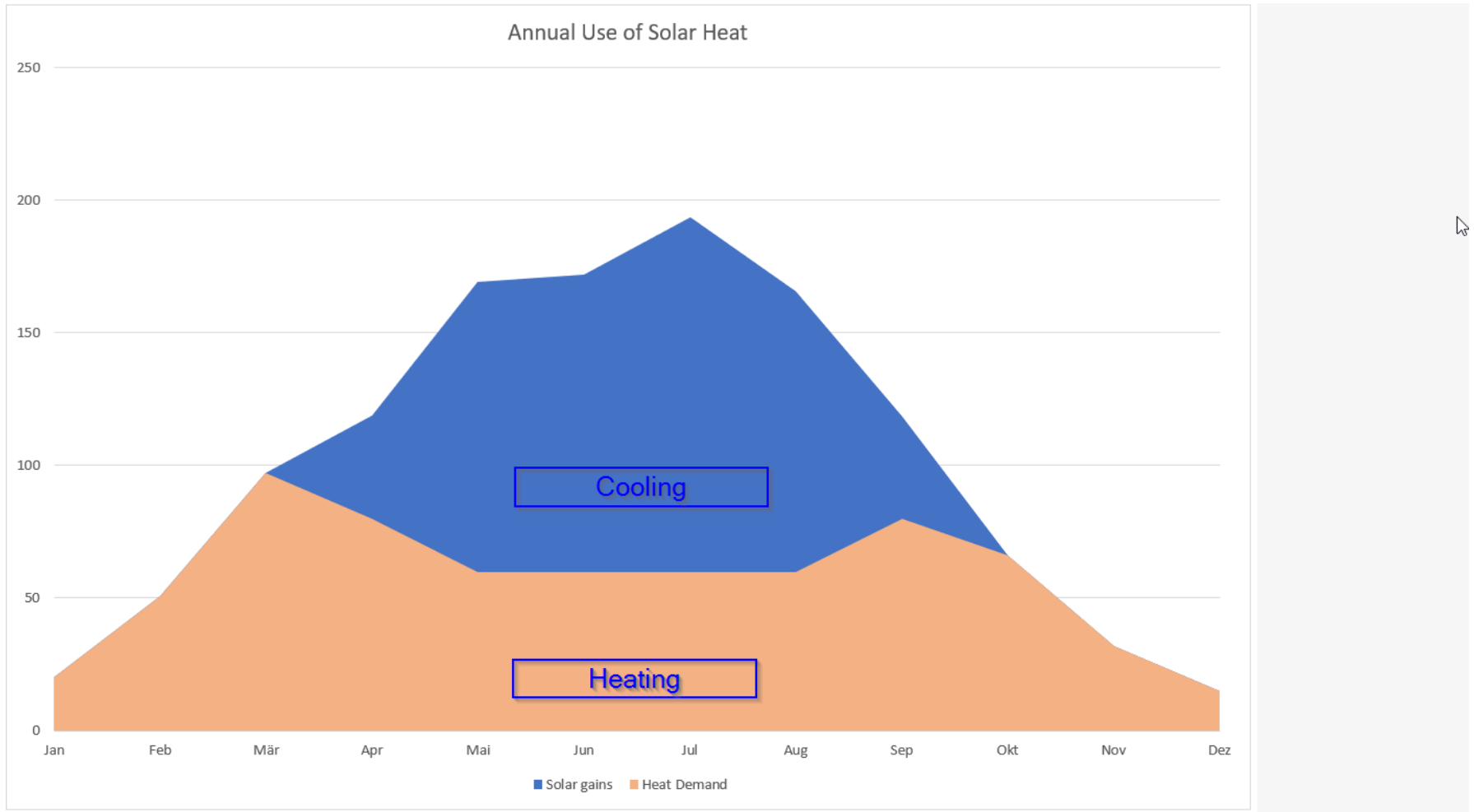
- Solar System is oversized for summer heat demand
- Cooling takes advantage of this heat surplus
- **Combing heating and cooling supply allows significant increase in solar supply**



Smart integration- solution



3 times more solar heat possible



Project Features

AVL Company

TECHNICAL SPECIFICATIONS & SPECIAL FEATURES



Collector area

3,463 m²



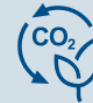
Absorption cooling
machine

650 kW



Buffer storage

70 m³



CO₂-savings

320 t/a

- [Cooling + Heating] Heat purchase agreement
- Combination of industrial cooling and heating
- Renewable electricity is available also for industries in urban area but the heat supply from renewable sources is a challenge that is addressed with solar thermal energy in this project

Photos



ABSORPTION MACHINE	
MODEL	1GJLH024
SERIAL NO.	1GJLH024-41170701
MANUFACTURING DATE	2017.10.11
COOLING CAPACITY	650 kW
CHILLED WATER FLOW RATE	93.2 m ³ /h
CHW INLET/OUTLET TEMP.	12 / 6 °C
DESIGN PRESSURE	1.0 MPa
COOLING WATER FLOW RATE	201.8 m ³ /h
CW INLET/OUTLET TEMP.	26 / 32 °C
DESIGN PRESSURE	1.0 MPa
POWER SUPPLY	3 φ 400 V 50 Hz
	133 usRT
HOT WATER FLOW RATE	68.2 m ³ /h
HW INLET TEMP	80 °C
HW OUTLET TEMP	70 °C
DESIGN PRESSURE	1.0 MPa
SOL.PUMP	10.9 kW
REF.PUMP	0.9 kW
VACUUM PUMP	0.6 kW



Thank you for your attention!

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FOKUSTHEMA INDUSTRIE

<https://solid.at/de/news/item/EnergyGlobeAVL.html>

<https://youtu.be/lnulhiQR2T4>



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