

HOE DE ENERGIEOPSLAG IN RELATIE TOT TECHNISCHE INSTALLATIES ONTWERPEN

Storage solar energy with heat pumps

27 05 2025

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Voorzitter ATIC



Storage solar energy with heat pumps

- Introduction
- Residential examples
- Commercial examples



Introduction - Residential PV example

- PV installation 5 kWp
- Max. production (summer): ca. 30 kWh

Introduction - Residential PV example

- Electrical storage
 - Battery
 - Electrical DHW

Storage	
Electrical	
Battery	
kWh	30
Electrical DHW tank – COP 1	30
Volume (L) - Delta T = 50 K	516

Introduction - Residential PV example

- Hydraulical storage
 - Heat pump
 - DHW heat pump

Storage	
Hydraulic	
HP A2W - COP 4	120
Volume (L) - Delta T = 10 K	10320
DHW HP - COP 3	90
Volume (L) - Delta T = 50 K	1548

Introduction - Realistic energy storage

Storage	Potential	Realistic	Delta
Electrical			
Battery			
kWh	30	12	-18
DHW electric rod - COP 1	30		
Volume (L) - Delta T = 50 K	516	200	-18,4
Hydraulic			
HP A2W - COP 4	120		
Volume (L) - Delta T = 10 K	10320	750	-111,3
DHW HP - COP 4	120		
Volume (L) - Delta T = 50 K	2064	400	-66,7

Residential examples

- HEMS
- Ice storage

Our opportunities at a glance

Battery

PV

Wall-
boxes

Heat
pumps

Venti-
lation

HEMS

WW
Storage



Climate Solutions

Connected devices

Residential:

Vitoconnect

2

Thermostat Heads

5

Commercial:

Vitocom

Vitodata

7

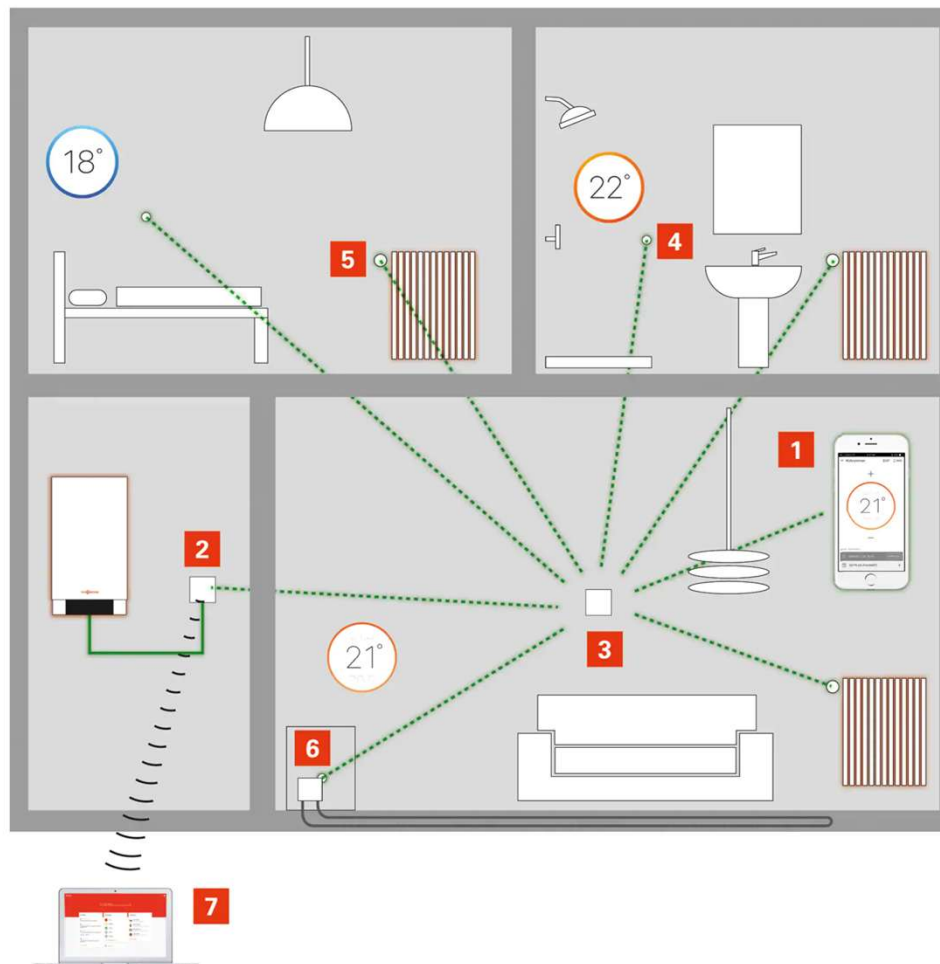
Vitoscada

Atic

for HVAC professionals



Products & Systems



Viessmann HEMS



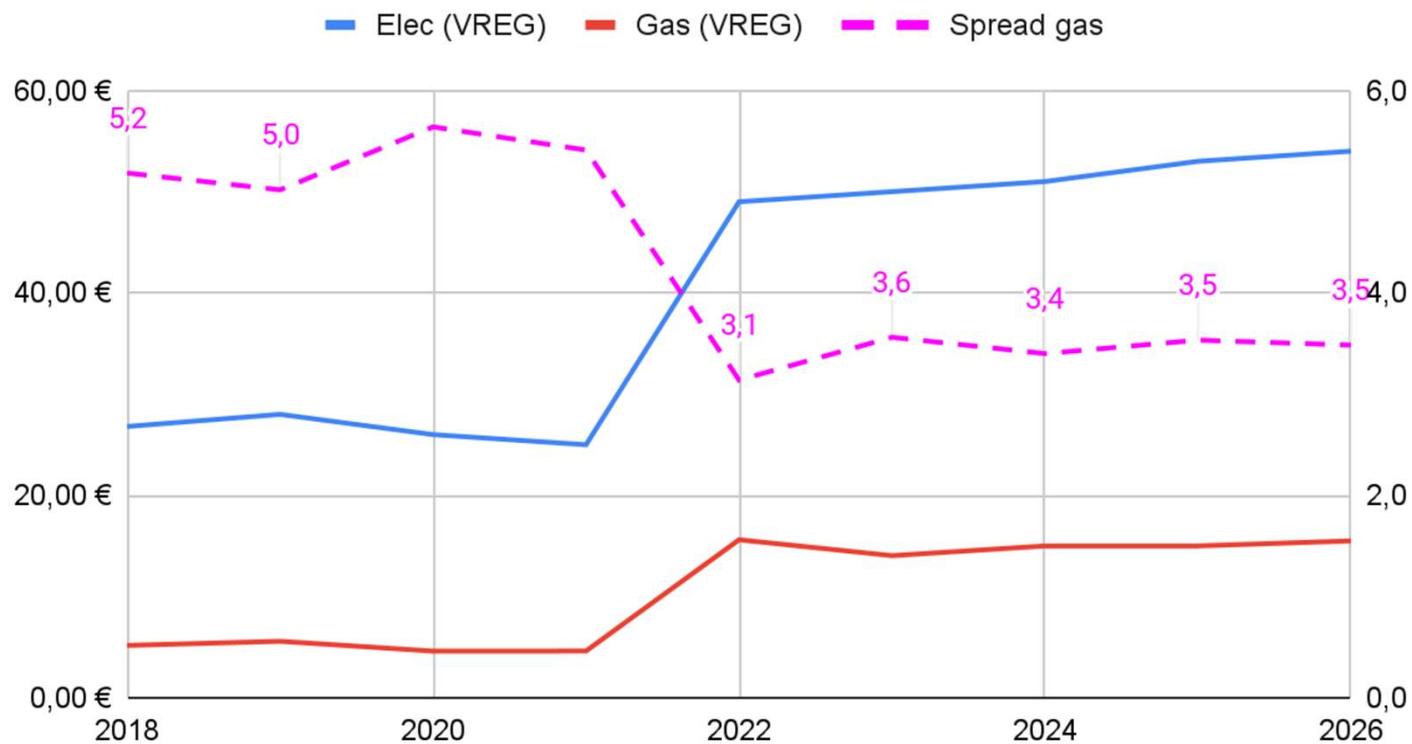
The integrated and intelligent Connectivity and Energy Management solution package that:

- manages all kinds of energy going into / leaving the house (gas, power, heat) across all building equipments (PV, Battery, HVAC, E-Mobility)
- optimizes local energy flows to increase energy efficiency, renewable energy share and to reduce system complexity, for electrical and hybrid devices (e.g. heat pump)
- can also trade local flexibilities (generation/storage/loads) through interaction with the smart grid

Belgium

General market environment & development

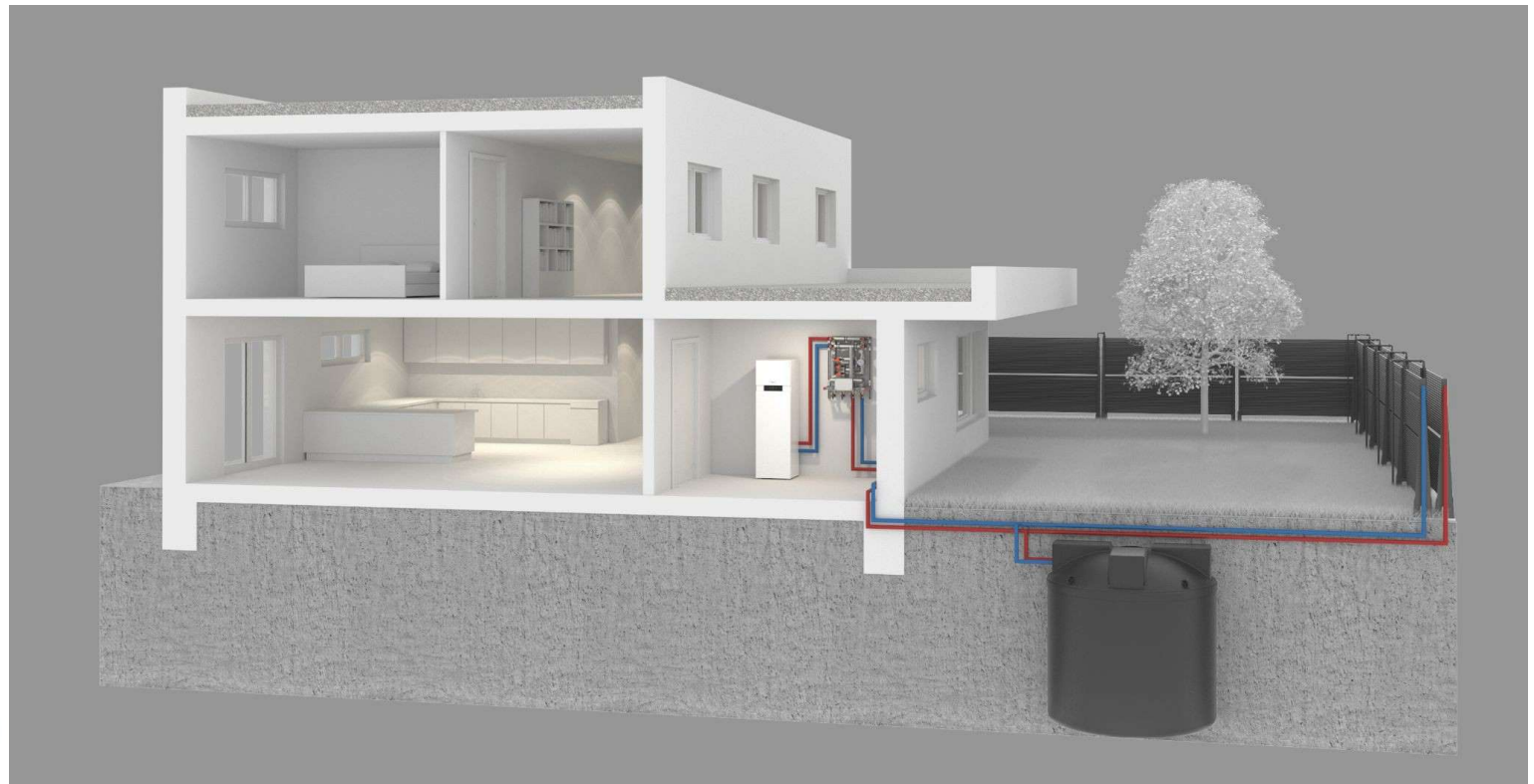
Elec (VREG) and Gas (VREG) / 100 kWh



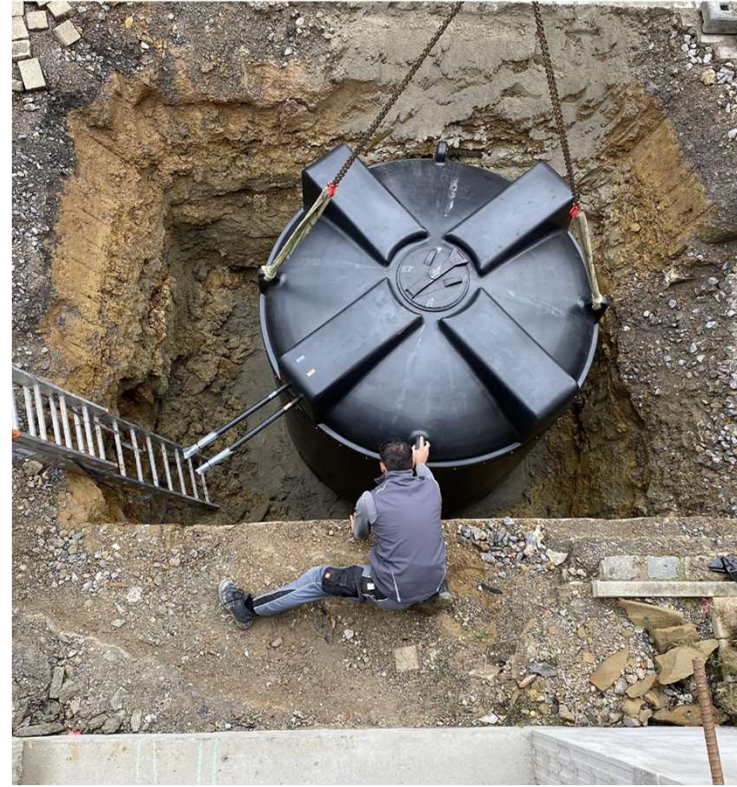
Gas/ electricity price (in € per 100 kWh)

- With the explosion of energy prices in 2022 the spread became more favourable for heat pumps
- Expectations are this spread will not become real beneficial for heat pumps
- On long term tax shift from electricity towards fossil fuels is expected. The general elections of 2024 however will delay the decision and implementation

Residential example – Ice storage

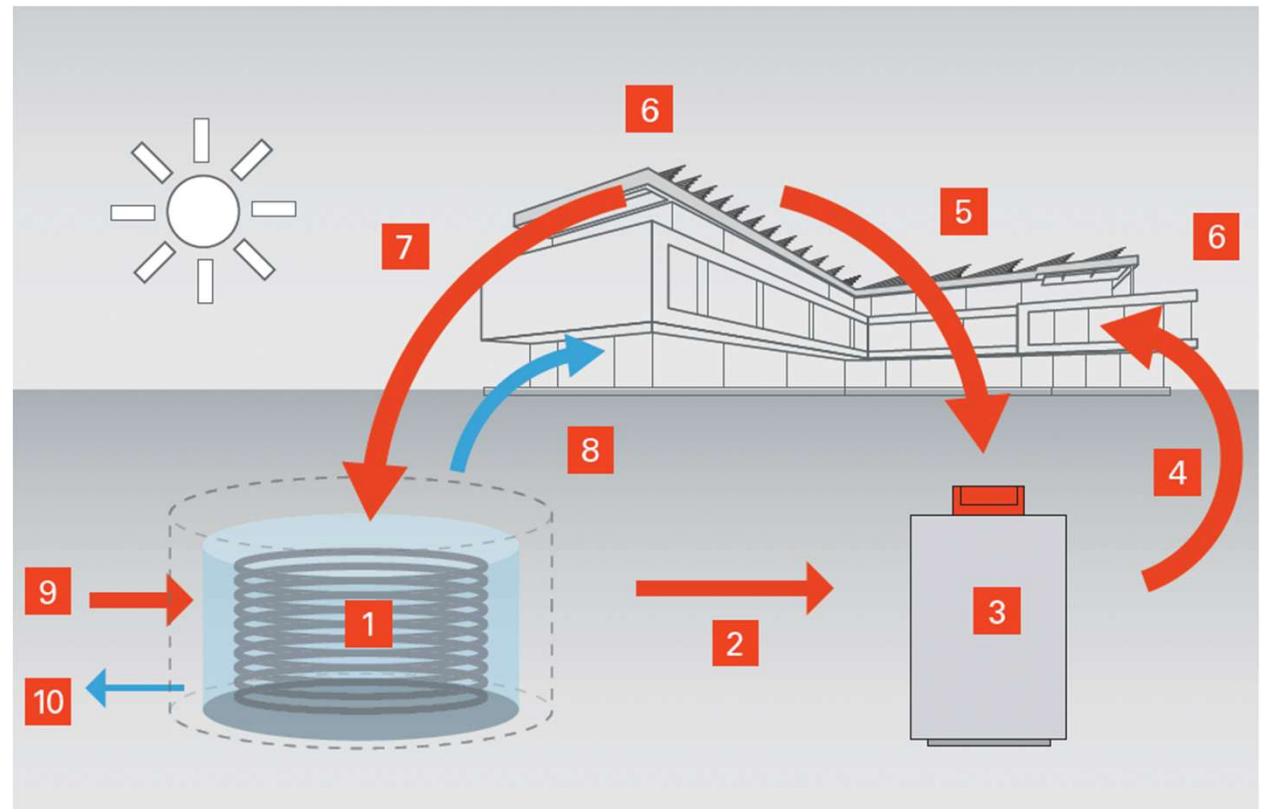


Ice storage

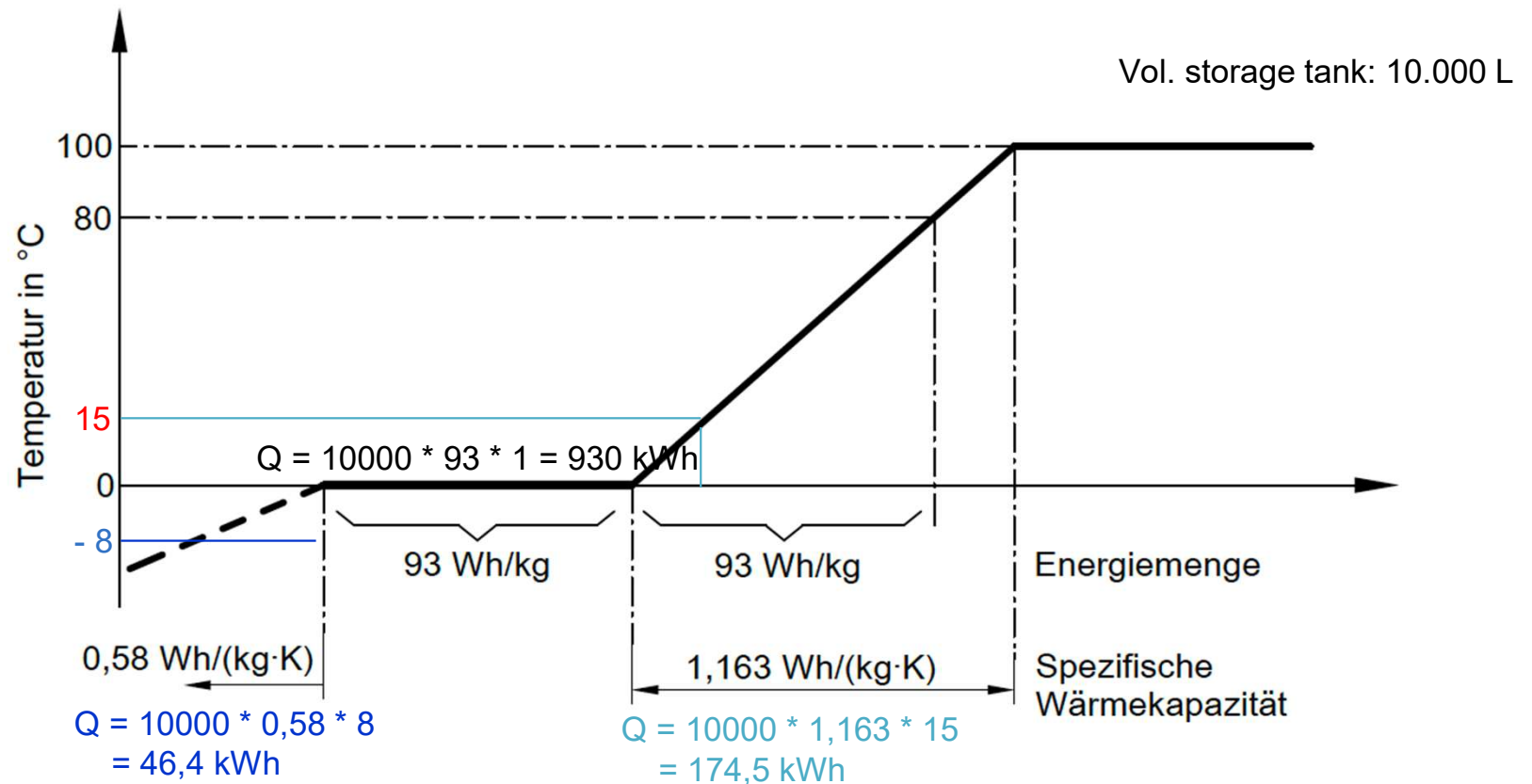


Ice storage - Principle

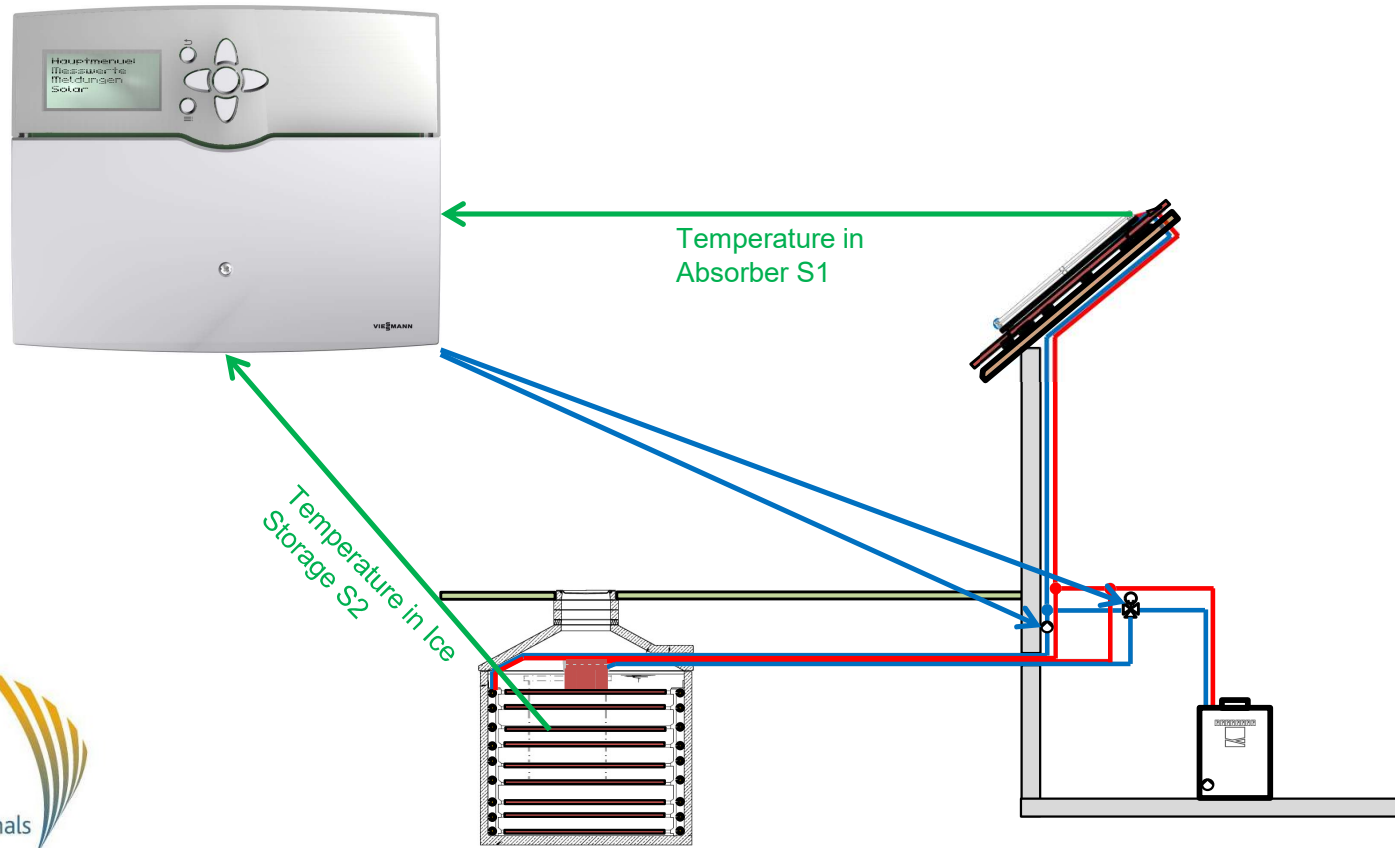
1. Ice storage
2. Energy from ice storage
3. Heat pump and controller
4. Energy heat pump to building
5. Solar thermal energy to heat pump
6. Solar-Air absorber
7. Solar thermal energy to ice storage
8. Natural cooling
9. Geothermal energy
10. Energy losses ice storage



Residential example – Ice storage

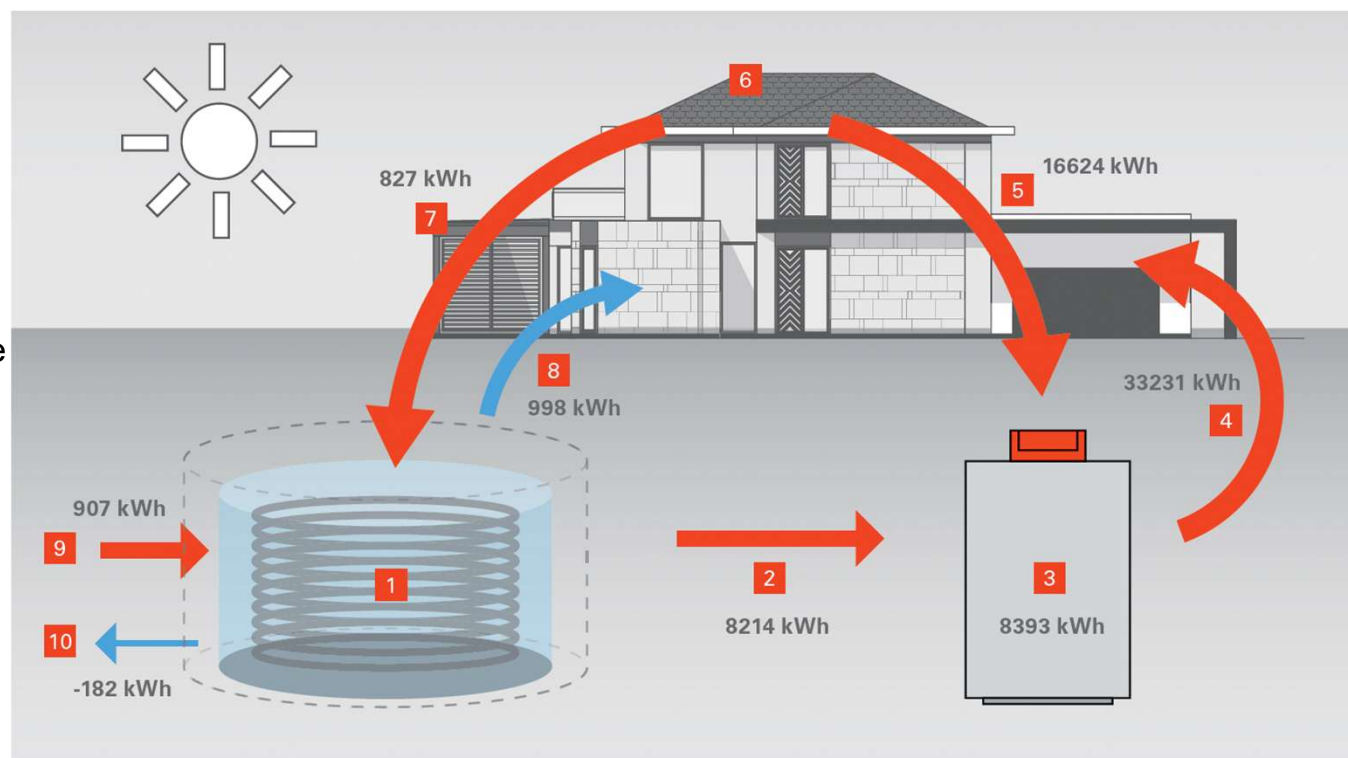


Residential example – Ice storage



Residential example – Ice storage

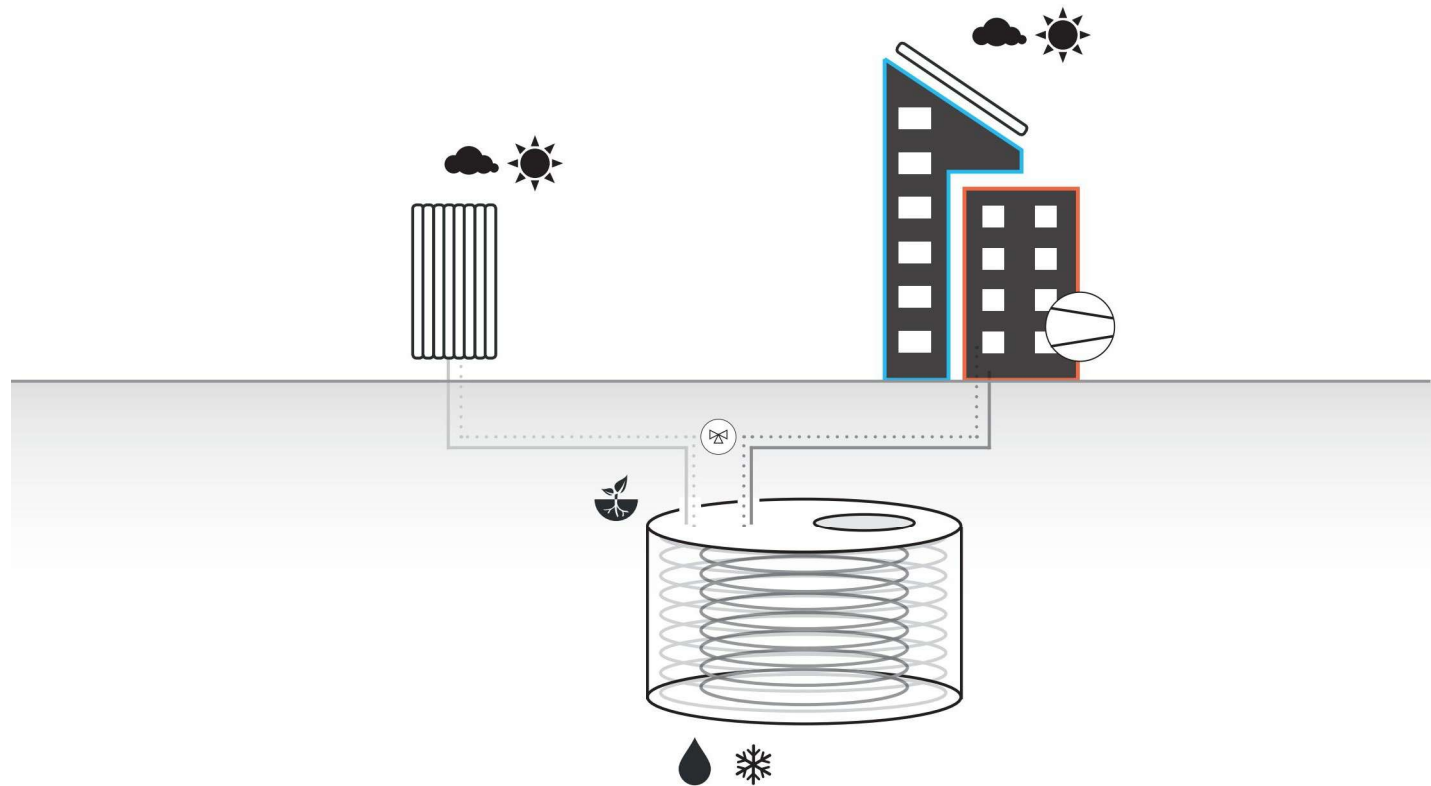
1. Ice storage: 20 m³, 17 kW
2. Energy from ice storage
3. Electrical consumption heat pump
4. Heating demand building
5. Hybrid E-PVT panels to heat pump
6. Hybrid E-PVT panels
7. Hybrid E-PVT panels to ice storage
8. Natural cooling
9. Geothermal energy
10. Energy losses ice storage



Residential example – Ice storage components



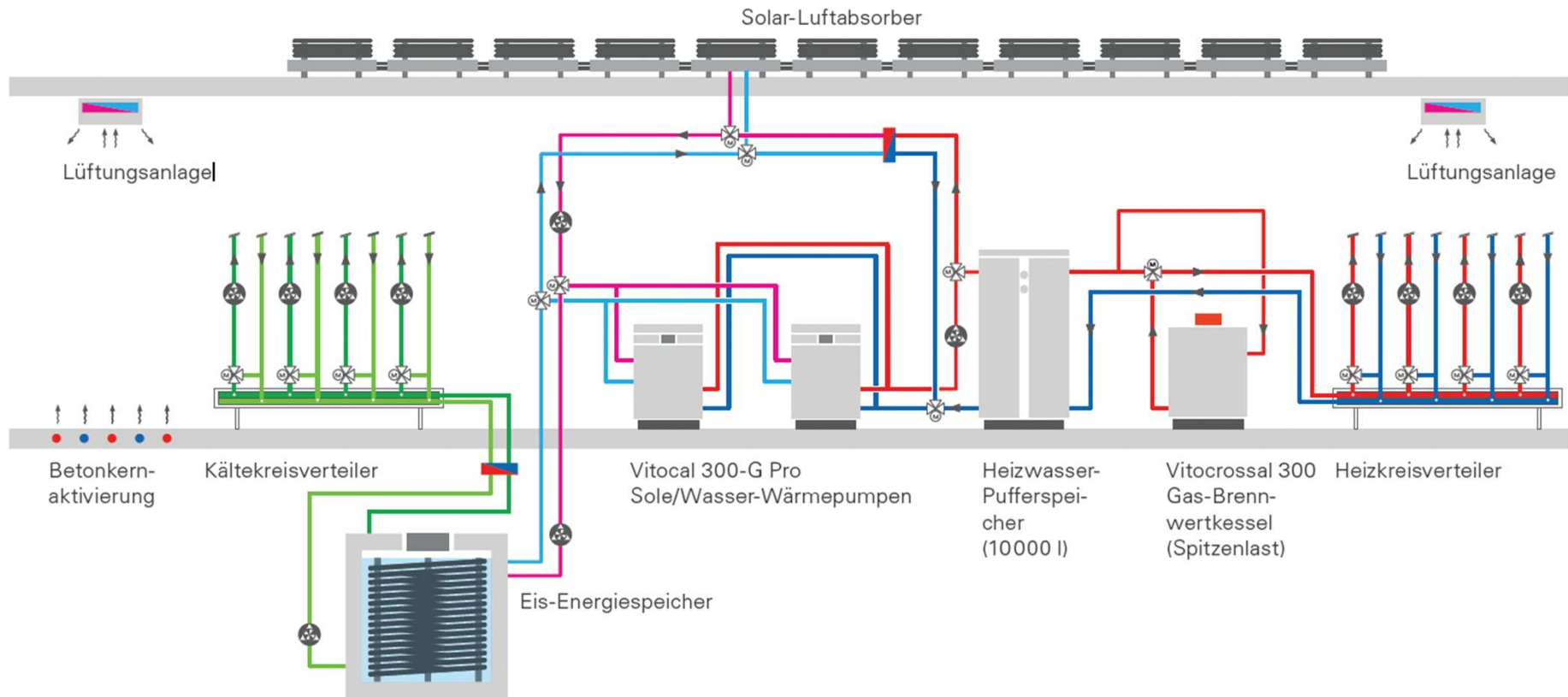
Commercial example – Ice storage



Commercial example – Ice storage

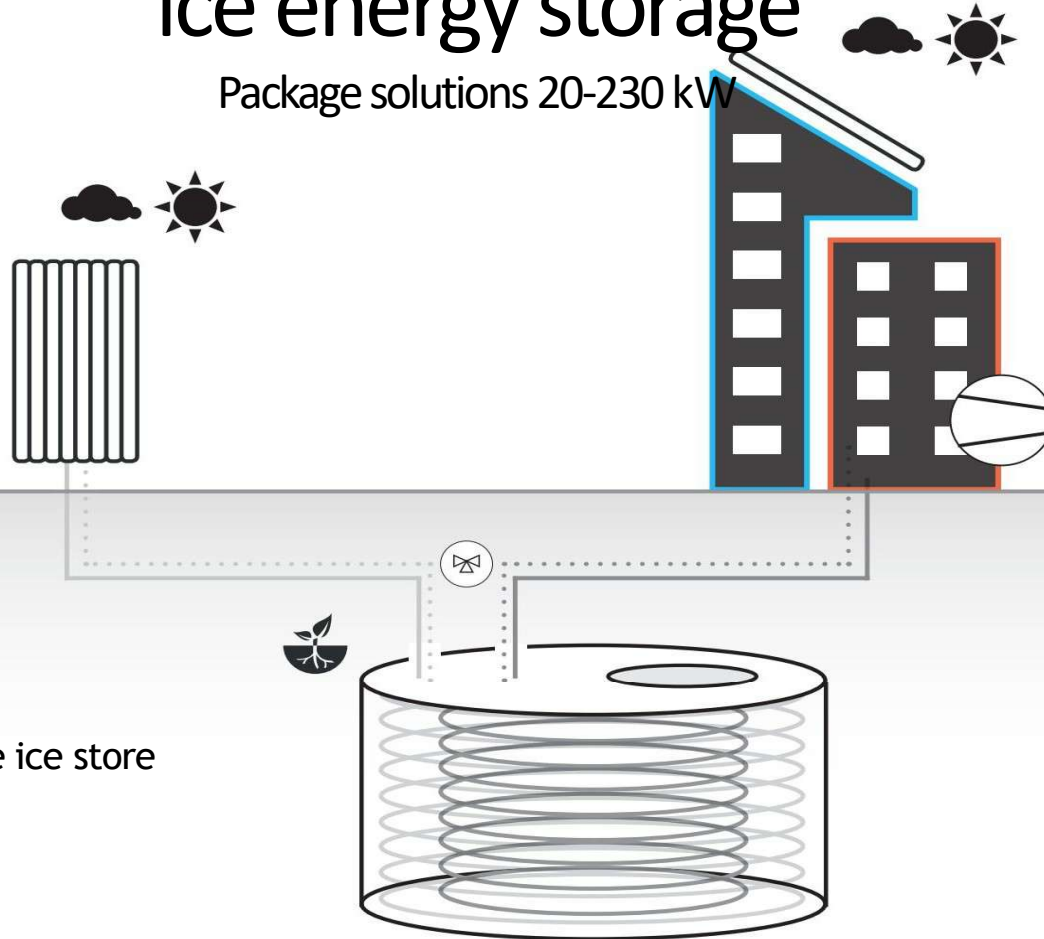


Commercial example – Hybrid ice storage



ice energy storage

Package solutions 20-230 kW



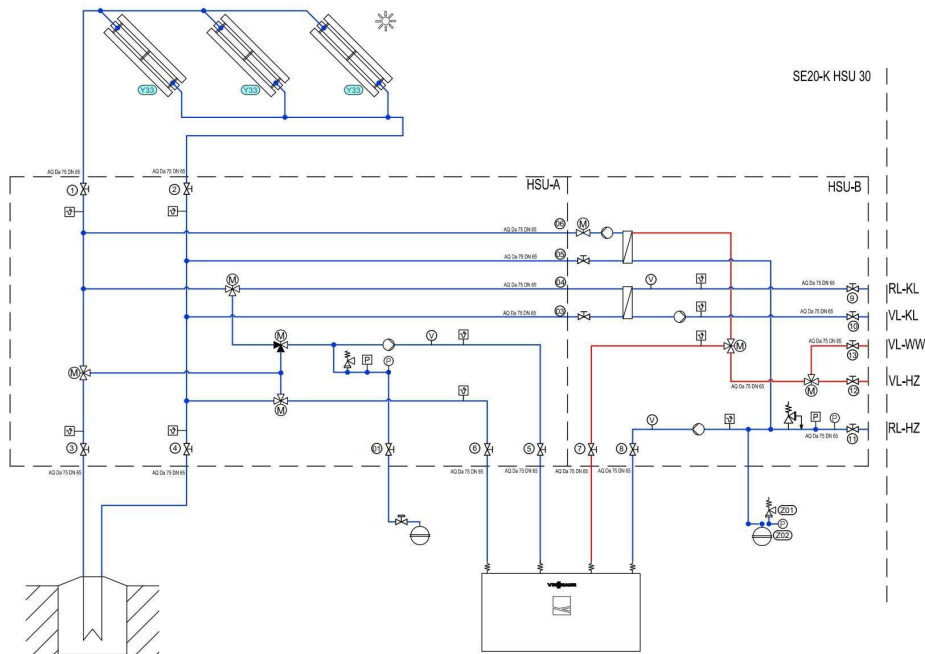
- ✓ Free cooling in summer
- ✓ Space-saving positioning of the ice store
- ✓ No noise emissions
- ✓ Individual modes of operation

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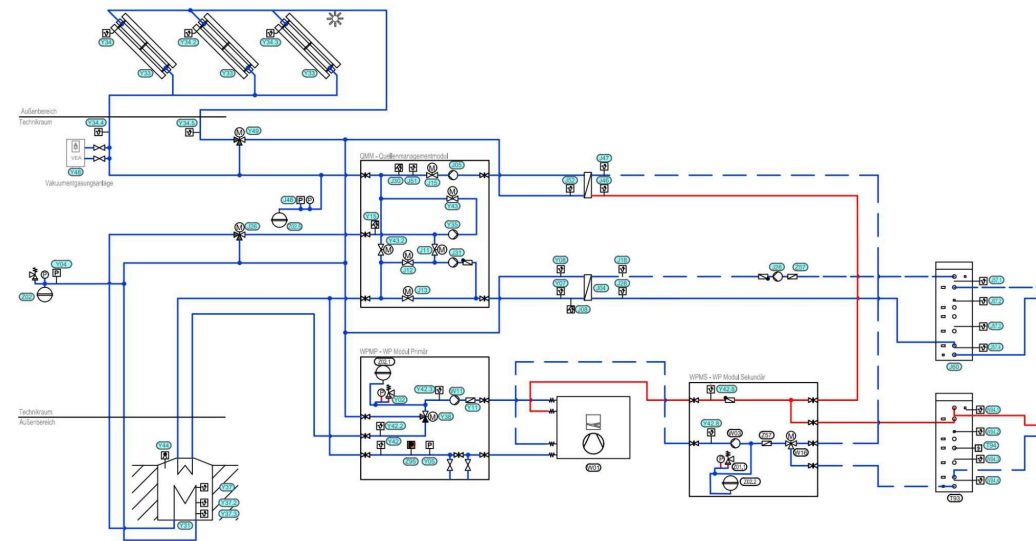
Storage solar energy with heat pumps

hydraulic diagram

control system



20 to 45 kW → HSU / TA



from 60 kW → Vitocontrol

Atid
for HVAC professionals

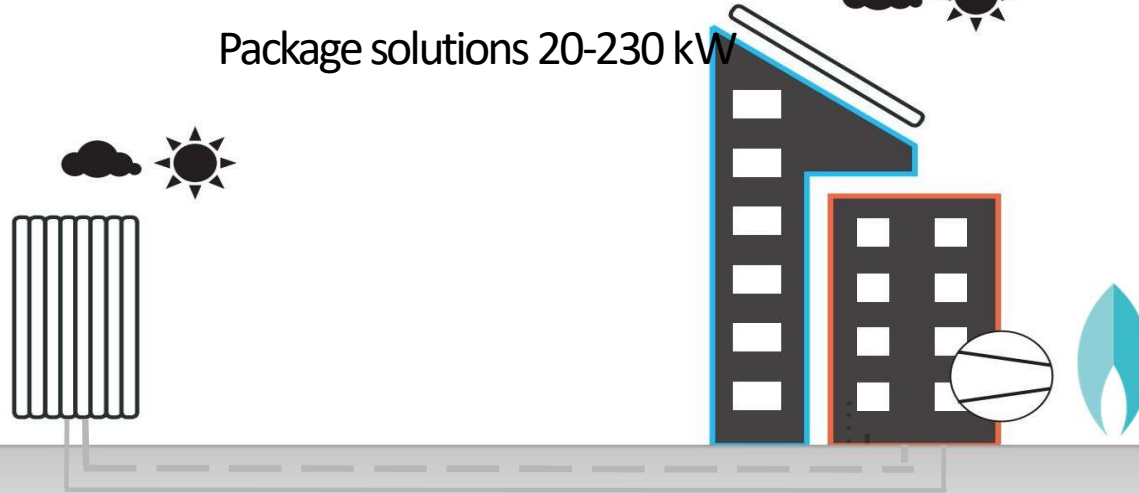
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Storage solar energy with heat pumps

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solar-air collector

Package solutions 20-230 kW



- ✓ No noise emissions
- ✓ Source up to approx. 0 °C ambient temperature
- ✓ Proportion of heat demand between 60 % and 90 %
- ✓ No defrosting necessary
- ✓ For ice energy storage system, second source for GeoCollect/probes or dual mode systems

Package solutions 20-230 kW





ATIC Seminar

Thanks for you attention

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5/26/2025

