

Dualsun hybridpaneler – Open Mic, 8 nov 2024



Hybridpaneler - en robust teknologi som utvinner **6 gånger mer energi** från takytorna



DualSun introduction

Dualsun, established year 2010, is developing high-performance **solar hybrid & photovoltaic** panels that reduce the carbon emissions of our homes and buildings.



1st manufacturer in the world, year 2013, to obtain the TÜV Rheinland's solar hybrid panel certification



€60M turnover in **2023**
180 MWp delivered in **2023**



2 locations in France : headquarters in Marseille, production site in Jujurieux (east of Lyon)

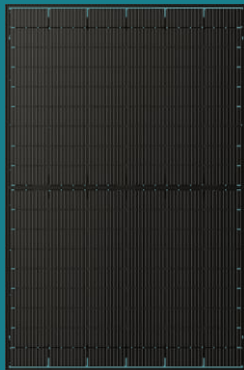


€19.1M invested in product development since 2010
80 Employees



The 3 solar energy technologies and their efficiency

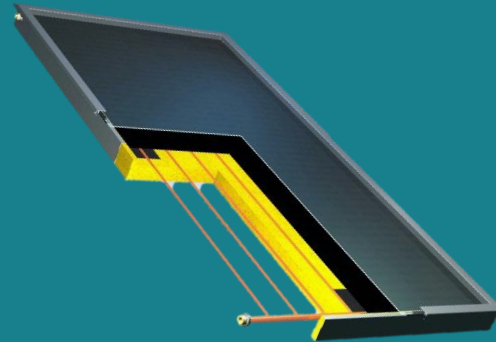
Solar panels (PV)



PV panels generate electricity with approx. **22%** efficiency

Max temperature 60-65°C

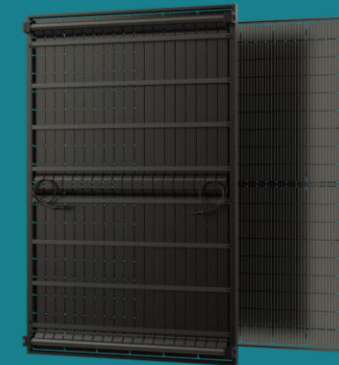
Thermal collectors (T)



T-panels generate heat and hot water with approx. **60%** efficiency

Max temperature 200°C

Hybrid panels (PVT)

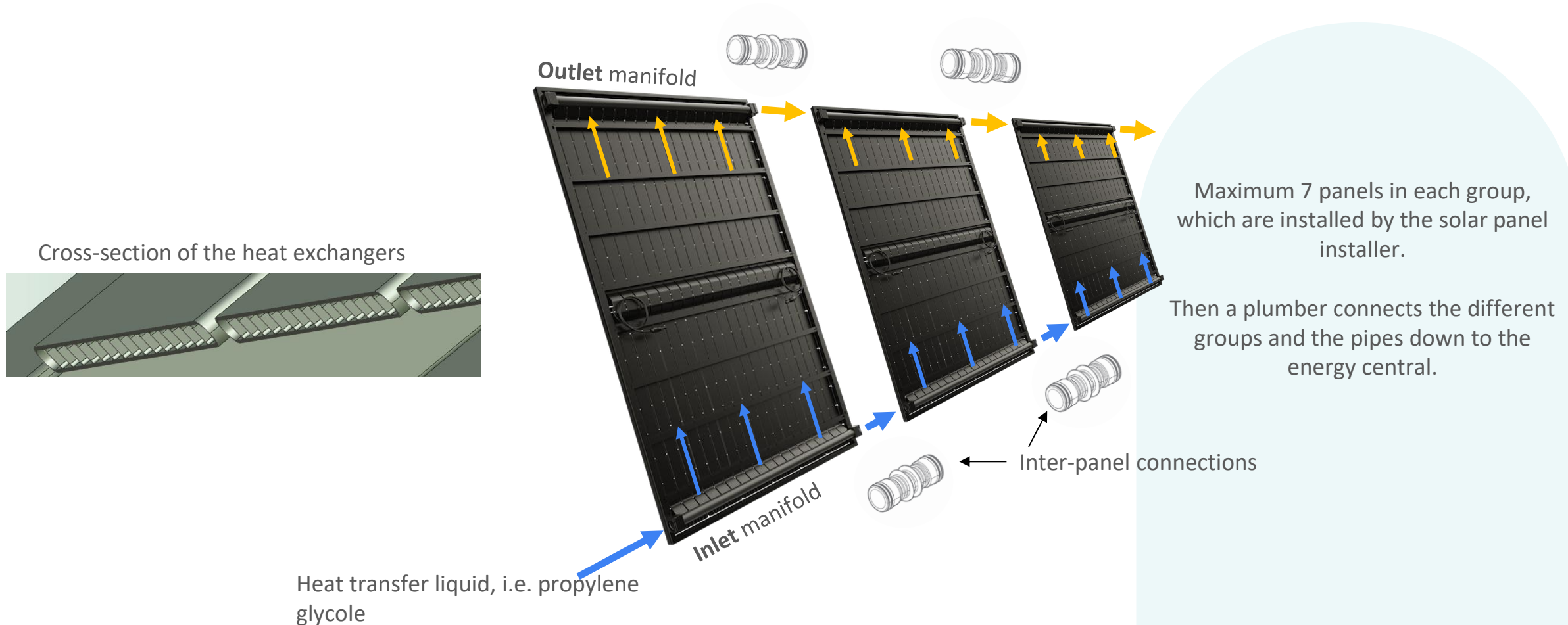


Hybrid panels generate both electricity and heat in the same panel with approx. **35-180%** (including yield from the air) depending on application

Max temperature 60-65°C



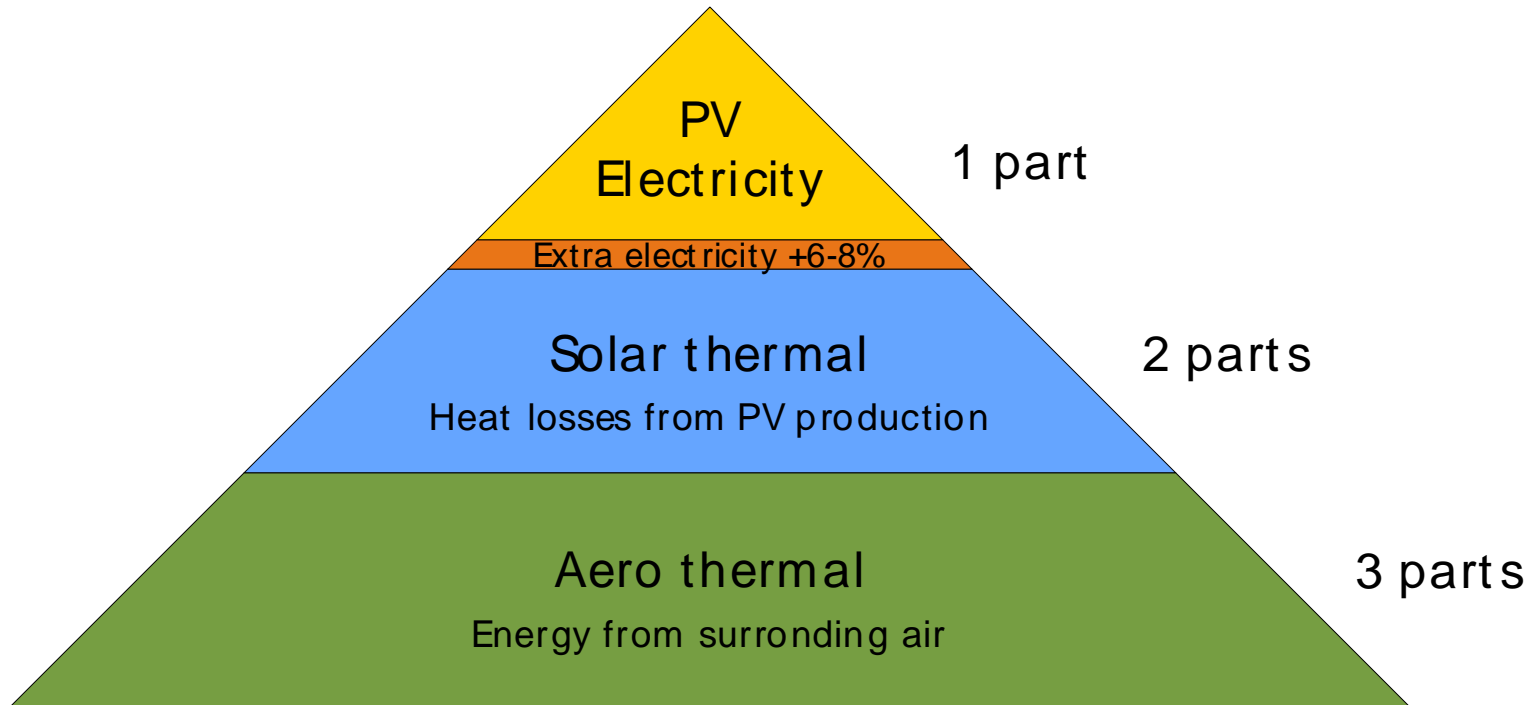
How does the heat exchanger of a solar hybrid panel look like, and how are the panels connected together?



How is it possible to extract 6 times more energy from the roof tops?

A hybrid panel brings together 3 different technologies in one panel:

- 1) Solar panel (PV)
- 2) Solar collectors (T), but with a maximum 65°C stagnation temperature in PVT (same as PV), instead of 200°C as in Solar Collectors
- 3) Air/water heat exchanger on the backside of the PV panel



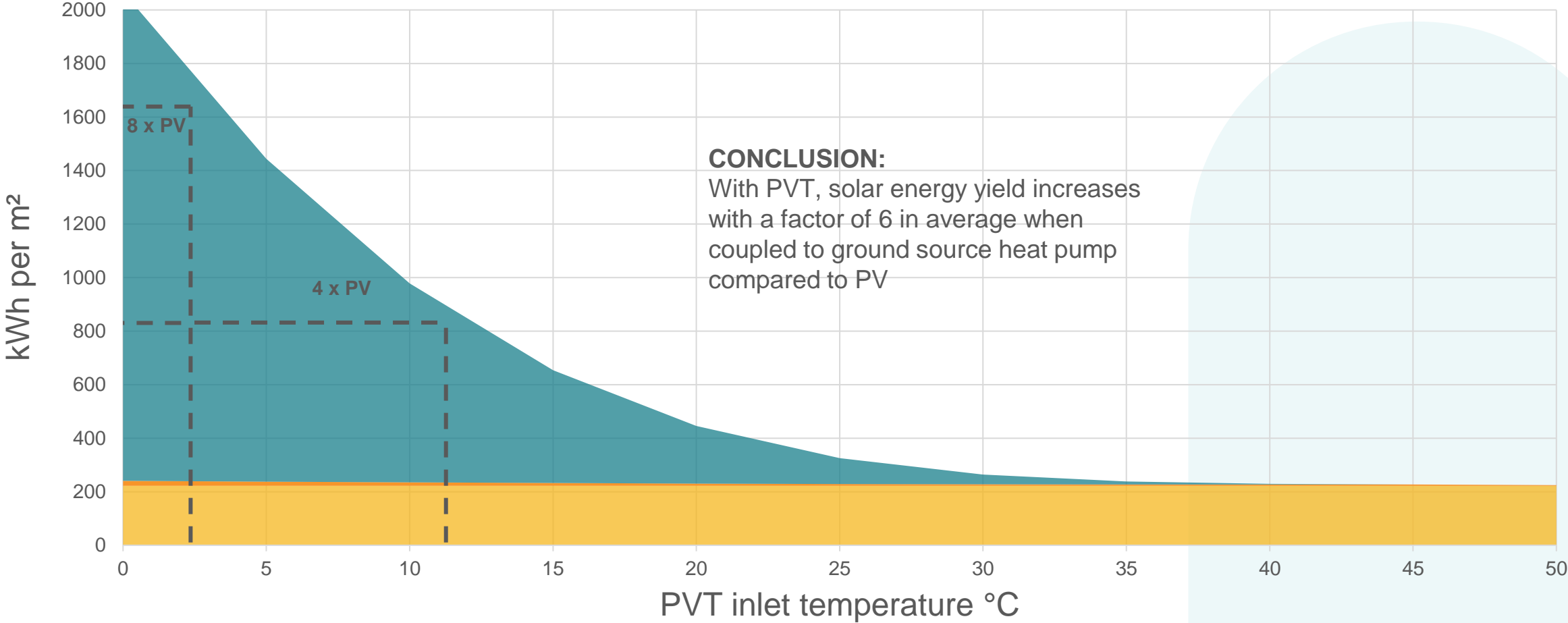
1+2+3 = 6 times more energy

Hybrid panels do not only address electricity - but also the major energy consumers = **heating and hot water**



Hybrid panels in combination with geothermal heat pumps = “Match made in heaven”

Dualsun SPRING4 425 TOPCon non-insulated
Simulated yearly energy production with Polysun
Stockholm, South facing, 30° elevation



■ Electrical production ■ Electrical production boost ■ Thermal production



PVT add-on kit for residential heat pumps = new business opportunity for PV- installers teaming up with heat pump installers

Optimize your ground source heat pump and rescue cold boreholes with DualSun hybrid panels (PVT)

ELECTRICAL

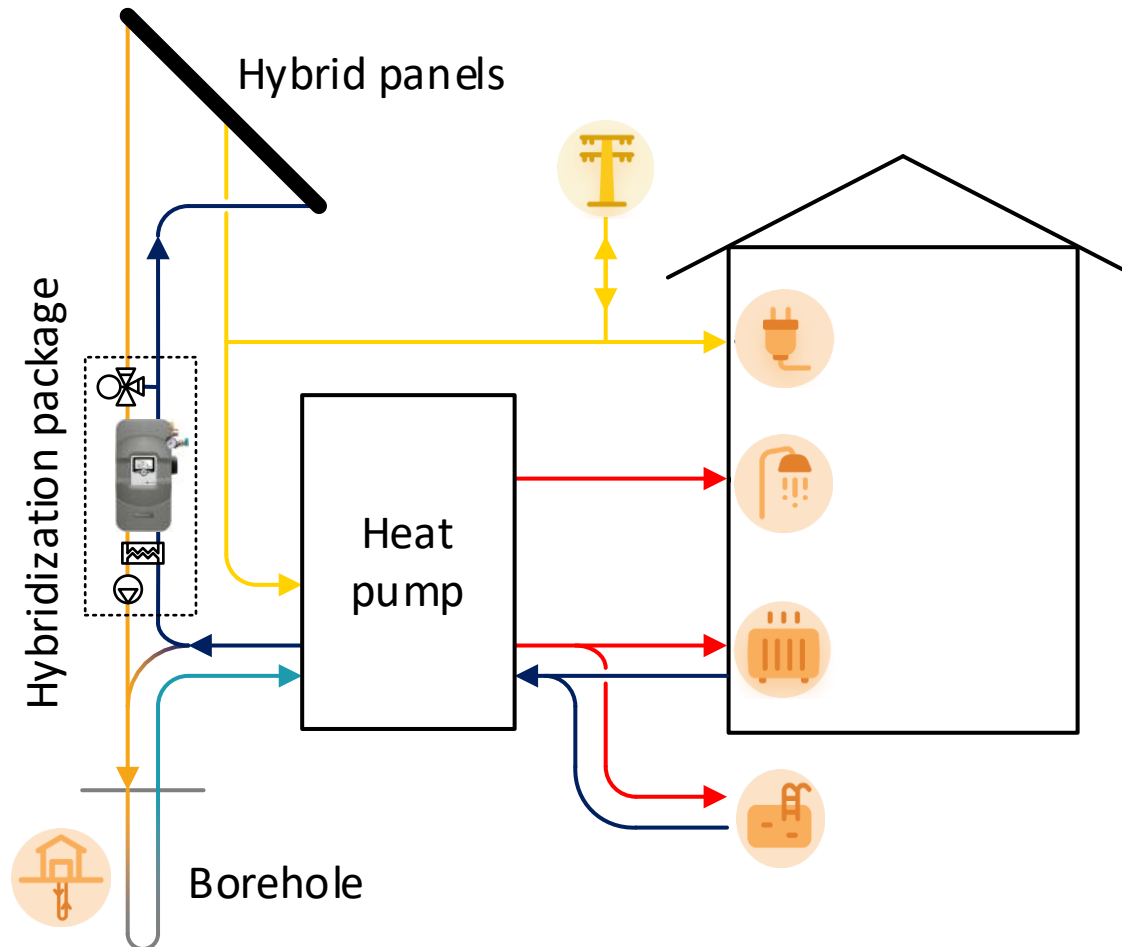
- Electricity to heat pump and building
- Increased electrical production and lifespan through cooling towards borehole

THERMAL

- Recharge of cold boreholes = energy balance
- Prevents cold boreholes when changing to a new, more efficient and powerful heat pump = avoid additional drilling

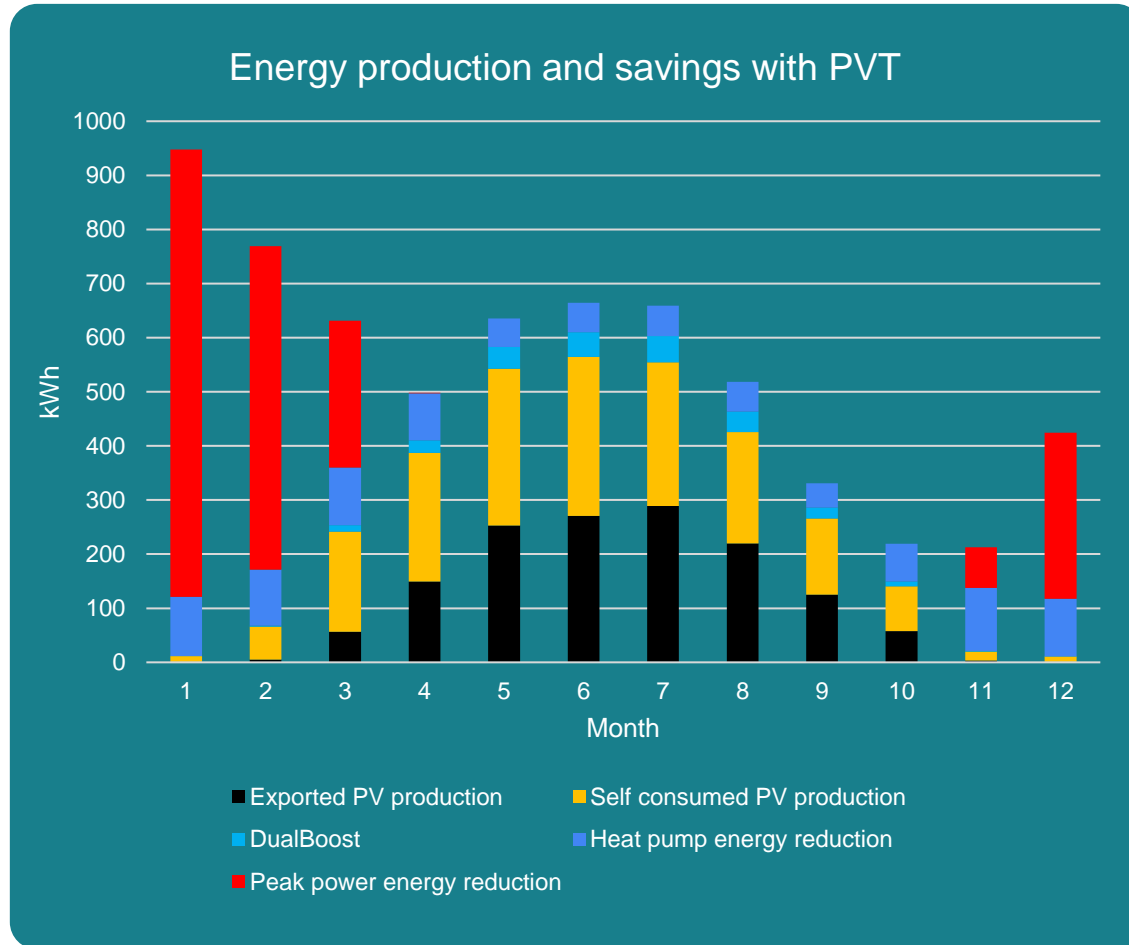
Increased brine temperature gives:

- Increased efficiency (COP and SCOP)
- Increased energy and power coverage
- Reduced peak power and energy
- Extended life span of heat pump



With PVT you get benefits from solar energy throughout the year

Save energy by letting the heat pump work under better conditions with recharge of heat from hybrid panels (PVT)
 The upgrade cost from PV to PVT significantly lower than the cost of additional drilling => payback time = 0 years



Example with 8 kW residential heat pump with a cold borehole

	With PV	With PVT
Room heating	30 000 kWh	
Hot water	5 000 kWh	
Heat pump nominal capacity	7.6 kW (B0/W35)	
Heat pump true capacity	5.6 kW (B-5/W55)	6.9 kW (B0/W55)
Heat pump SCOP	3.3	3.9 (+19%)
System SCOP**	2.6	3.3 (+28%)
Energy coverage	89%	94%
Power coverage	43%	51%
Operating hours	5293	4761 (-10%)
Electrical production	3230 kWh	3469 kWh (+7.4%)
Sold electrical production	1431 kWh	
Compressor energy saving	-	953 kWh (-10%)
Reduction in maximum peak power	-	1,3 kW (-16%)
Reduction in peak power energy	-	2079 kWh (-51%)
Est. compressor life span extension	-	10% = ~2 years
Total energy reduction	1799 kWh	4831 kWh (+169%)



Two inspiring reference projects (commercial apartments)

More references on <https://www.linkedin.com/company/dualsun-nordic>

Positive energy building in Karlskrona

- Liquid-water heat pump combined with boreholes and PVT
- 100% power and energy coverage for electricity, heating and hot water
- 84 PVT panels
- 130 PV panels



PVT heat pump optimized building block in Lund

- Liquid-water heat pump without boreholes, and PVT as only source = Re-Power Europe Solution!
- 50% energy coverage, and 50% through district heating
- 168 PVT panels
- 112 PV panels



We will assist you with your projects!



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