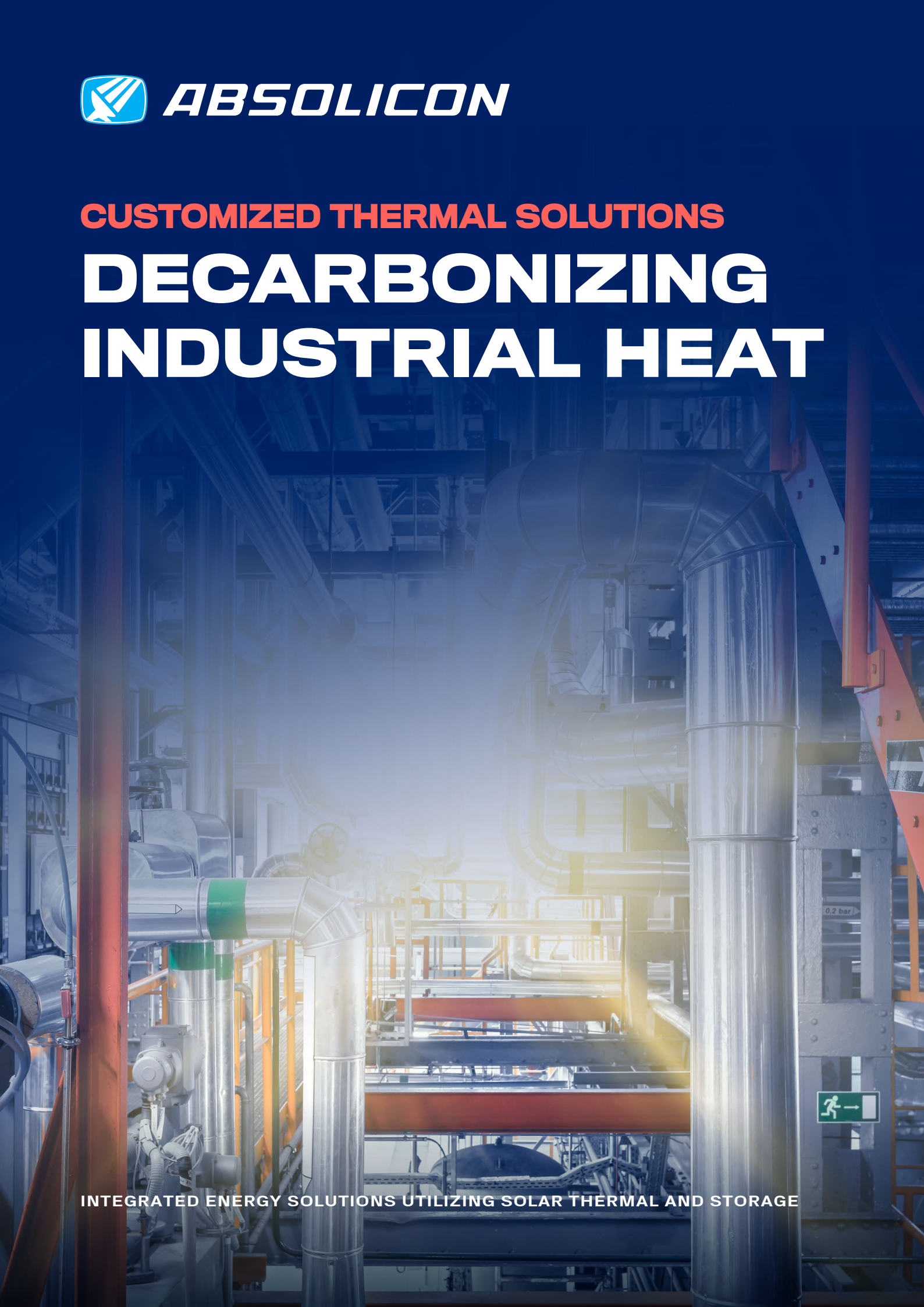
ABSOLICON

CUSTOMIZED THERMAL SOLUTIONS

DECARBONIZING INDUSTRIAL HEAT



INTEGRATED ENERGY SOLUTIONS UTILIZING SOLAR THERMAL AND STORAGE

REVOLUTIONIZING HEAT SUPPLY

HEAT IS HALF OF THE GLOBAL FINAL ENERGY USE.
IN ORDER TO ENSURE THAT FUTURE GENERATION GET THE SAME PRIVILEGES WE HAVE TODAY,THE RISING ENERGY DEMAND MUST BE MET WITH RENEWABLE ENERGY. **THIS IS WHY ABSOLICON EXISTS**.

Heat is half of the global final energy use. In recent years, due to geopolitical situations, renewable heating solutions have gained significant attention. In order to ensure that future generation get the same privileges we have today, the rising energy demand must be met with renewable energy. This is the reason I started Absolicon.

Absolicon Solar Collector was founded with the vision to transform industrial heat supply. To reach the climate goals, burning fossil fuels for heating needs to be a thing of the past. Transforming to sustainable energy solutions is not a goal of Absollicon, it is a must for everyone on our planet.

The company Absolicon was established in 2005 as a research and development company in solar technology. Today, Absolicon is a business company with more than ten years of operational experience from thousands of square meter installed area in installations worldwide.

By providing world-leading, cost-effective solar heat solutions for industries around the world, we are on a mission to lead the change towards a sustainable heat supply for our planet.

Joakim Byström
CEO & Founder of Absolicon

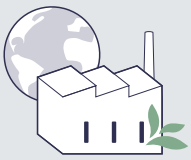
TRANSFORMING TO SUSTAINABLE ENERGY SOLUTIONS IS NOT A GOAL, IT IS A MUST FOR EVERYONE ON OUR PLANET.

KEY REASONS

WHY INDUSTRIES AROUND THE WORLD TURN TO SOLAR THERMAL

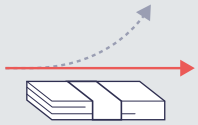
LOW CO_2 EMISSIONS

Significantly lower CO_2 emissions per unit of heat generation on a life-cycle basis compared to conventional and other renewable technologies.



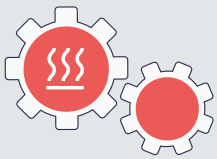
AVAILABILITY

Solar heating technologies have achieved a high technology readiness level, indicating maturity and high deployment levels.



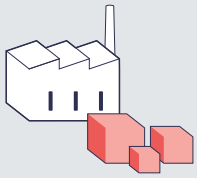
COST-EFFICIENCY

Solar heat has achieved cost parity with fossil fuels in regions, and it also offers stable heating costs, insulating users from price volatility.



VERSATILITY IN SUPPLY

Solar heating systems can deliver a broad range of supply temperatures (50-400 °C), making them adaptable to various industrial needs.



MANUFACTURING

The EU has a strong manufacturing base for solar heating components, with local supply quality, expertise, and capacity.

COLLABORATION OF HEAT TECHNOLOGIES

Once solar thermal technology is implemented, the remaining demand (not met by the solar field) can be fulfilled using electricity-based technologies.

These technologies include, for example, high-temperature heat pumps, PV systems with high-temperature storage, biofuel, and electric boilers. The combination of these systems can result in a 100% decarbonized heating solution.

The Absolicon team is widely experienced in designing these systems from several different industry segments and client conditions.

Click or scan to learn more about
Absolicon Solar Collector AB

www.absolicon.com

BREWING WITH THE SUN

BIRRA PERONI, ITALY

> In line with our long-term sustainability goals, we are committed to go zero emissions in our breweries by 2030. Sustainability performance in our Bari plant is already on the right track and thanks to the Absolicon technology we will take another big step closer towards our destination.

ENRICO GALASSO,
MANAGING DIRECTOR OF BIRRA PERONI

BIRRA PERONI, ITALY

BREWERY INDUSTRIAL CASE

BIRRA PERONI GO FOR ZERO CARBON PRODUCTION WITH CONCENTRATED SOLAR HEAT FROM ABSOLICON

Birra Peroni is part of global brewer Asahi Group. The Bari plant in Italy is part of Asahi Europe & International that produces the beer Peroni and Peroni Nastro Azzurro as well as other well-known Asahi brands like Raffo, Wuhrer and Tourtel.

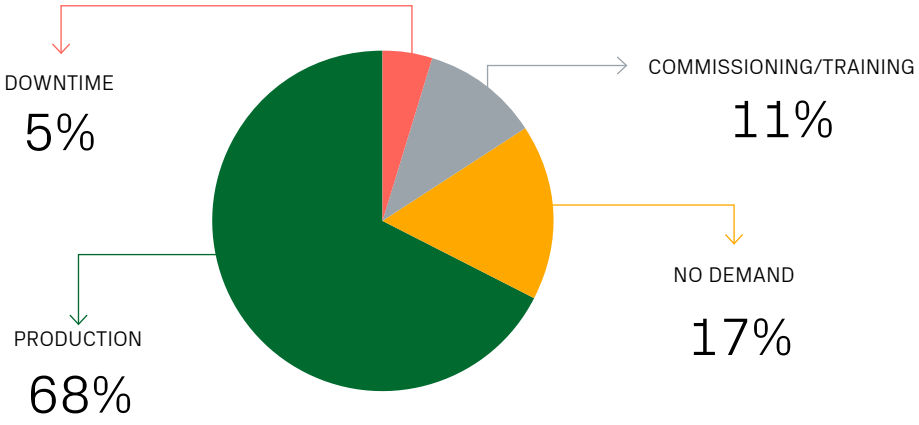
Absolicon is providing its patented solar collector Absolicon T160 and plant integration. Birra Peroni will then buy the solar heat produced through a heat purchase agreement to run the brewing processes.

The Absolicon T160 technology, with an operational temperature of up to 160°C heat and 8 bar steam, suits perfectly the thermal energy demand in the plant and secures energy independency of the brewery processes. The solar collector Absolicon T160 and plant integration provides Birra Peroni with solar heat to run the pasteurizer in the Bari brewery. The 460 kW solar thermal field will cover part of the brewery's annual thermal energy demand. During sunnier summer months, the collectors will ramp up their solar thermal contribution to satisfy a larger part of the thermal energy demanded for the pasteurizer process.

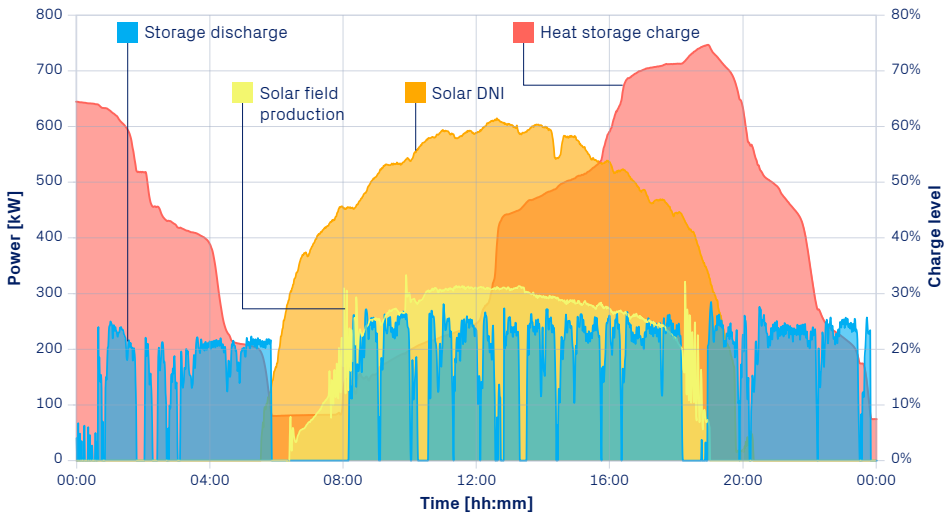
One of Birra Peroni's main sustainability targets is to achieve zero carbon emissions during the production process by 2030. Using solar energy for a wide range of brewery processing applications provides Birra Peroni the possibility of renewable heat at a constant energy price, enabling long term reductions in fuel costs and CO_2 emissions.

DURING SUNNIER SUMMER MONTHS, THE COLLECTORS WILL RAMP UP THEIR SOLAR THERMAL CONTRIBUTION TO SATISFY A LARGER PART OF THE THERMAL ENERGY DEMANDED FOR THE PASTEURIZER PROCESS.

OPERATIONAL SUNNY HOURS



A DAY AT THE BIRRA PERONI SOLAR THERMAL PLANT



LOCATION
Bari, Italy

INDUSTRY
Beverages and Brewing

TYPE OF PROCESS
Supplying heat for pasteurizer

INSTALLATION
Solar collectors
Plant integration
Heat battery

NUMBER OF COLLECTORS
120

APERTURE AREA
660 m²

SOLAR FIELD FOOTPRINT
1700 m²

STEAM GENERATION PRESSURE
5.3 bar(g)

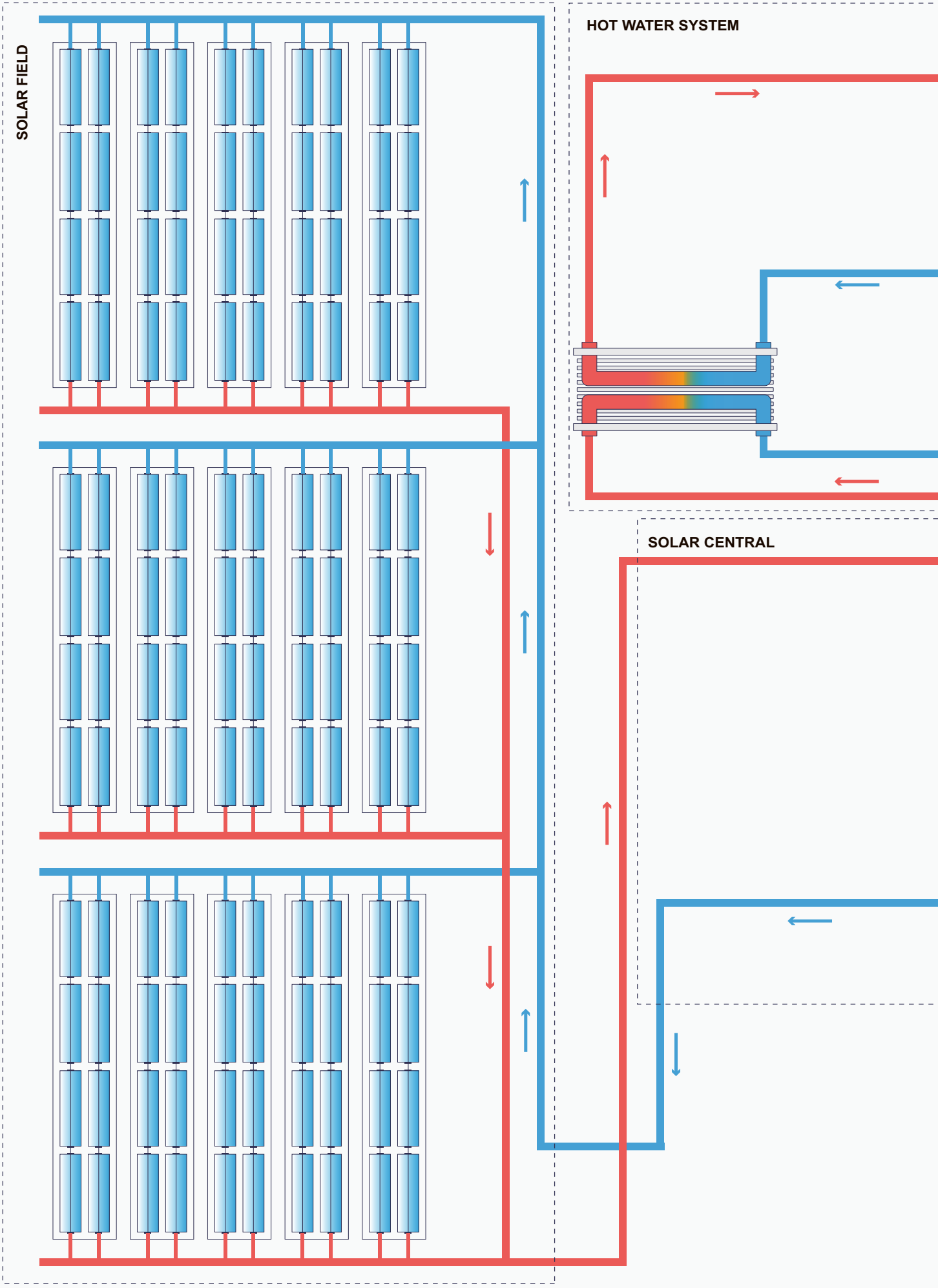
HOT WATER TEMPERATURE (FROM SOLAR FIELD)
142 °C

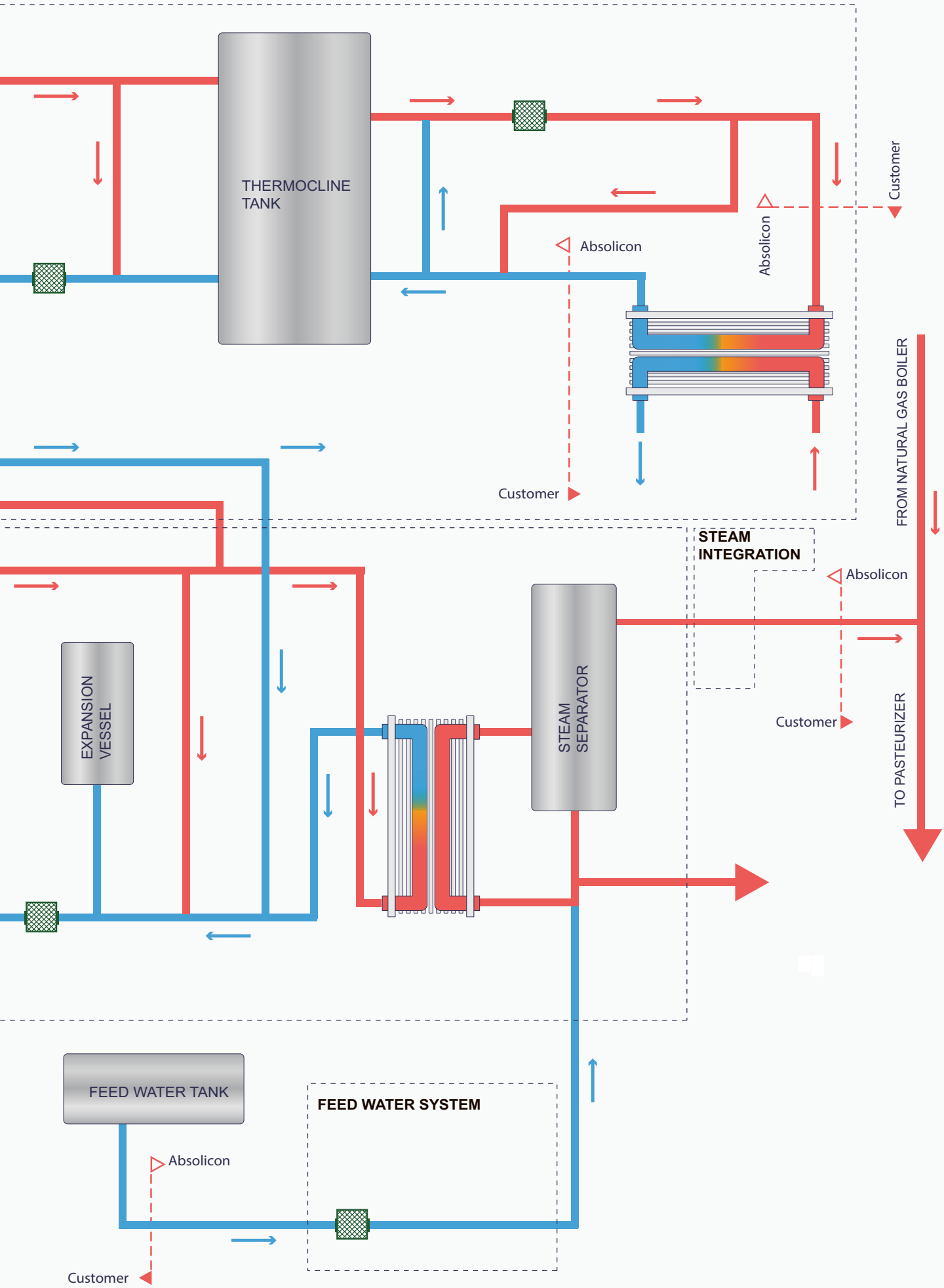
HOT WATER TEMPERATURE (TO HEAT EXCHANGER)
~75 °C

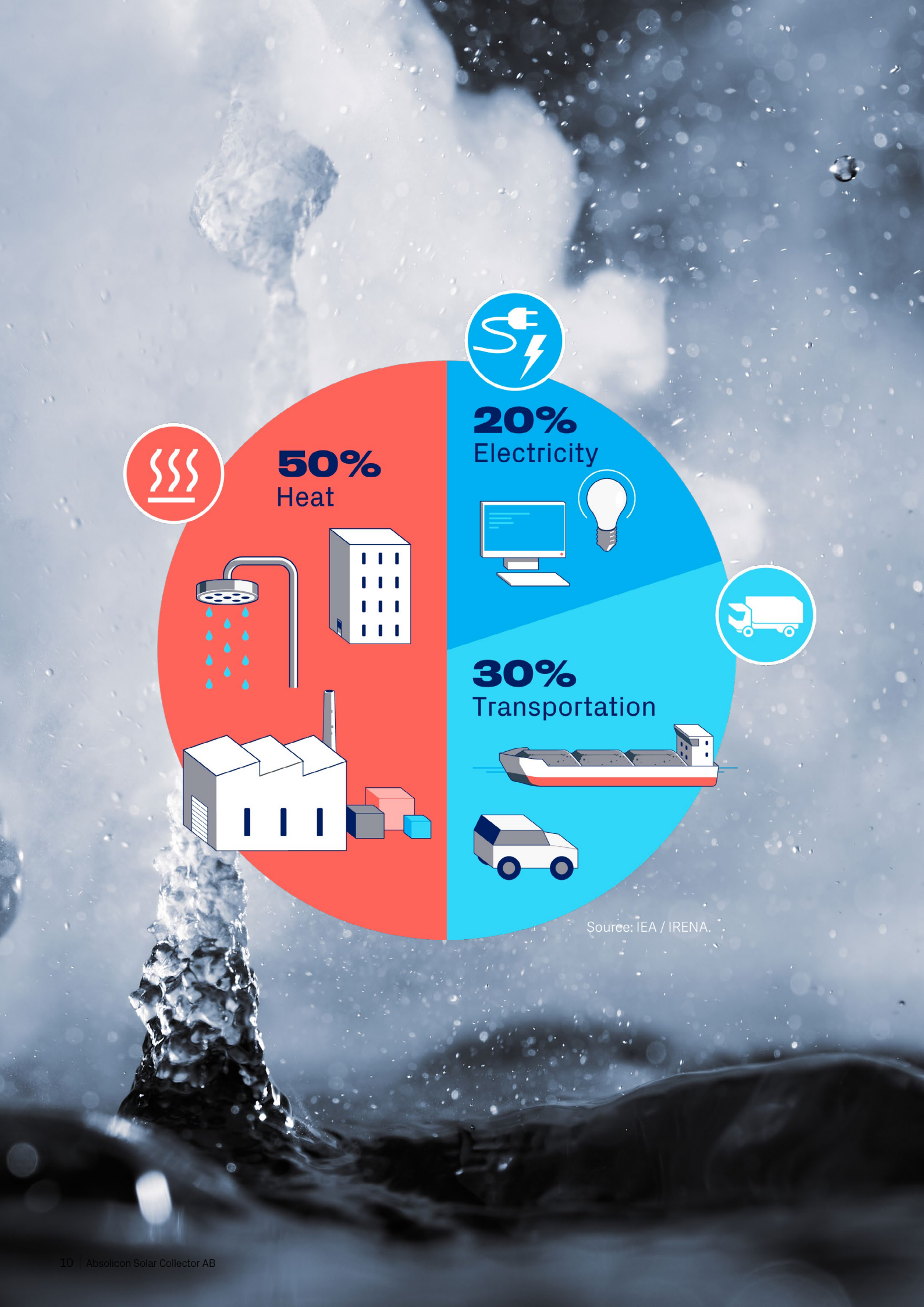
INSTALLED CAPACITY
460 kW

STORAGE TANK VOLUME
30 m³

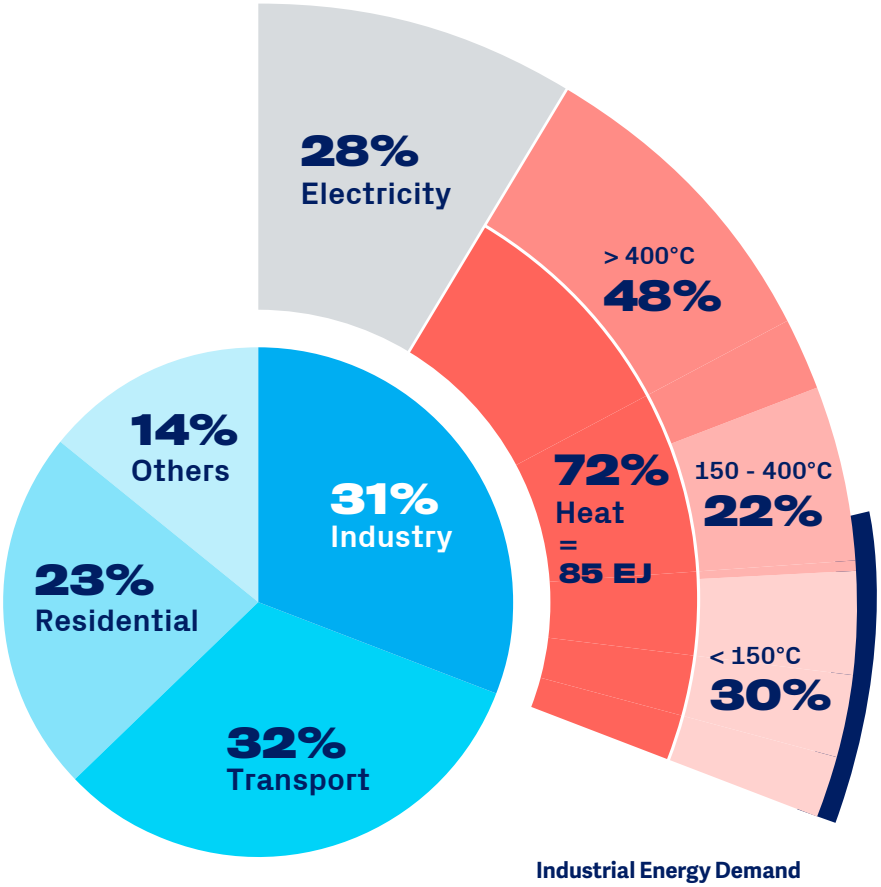
Click or scan QR code for a 1.5 min video about the installation of the solar thermal field.


SOLAR FIELD
HOT WATER SYSTEM
SOLAR CENTRAL


THERMOCLINE TANK
Absolicon
Absolicon
Customer
Customer
FROM NATURAL GAS BOILER
STEAM INTEGRATION
Absolicon
Customer
TO PASTEURIZER
EXPANSION VESSEL
STEAM SEPARATOR
FEED WATER TANK
FEED WATER SYSTEM
Absolicon
Customer



Source: IEA / IRENA.



Industrial Energy Demand

Total final energy consumption 2018: 382 EJ.

Source: IEA / IRENA.

HEAT IS HALF

DESPITE THE EMISSION REDUCTIONS OF RECENT YEARS, SCOPE 1 EMISSIONS IS A GROWING CHALLENGE FOR MANY INDUSTRIES.

Many companies can report significant carbon reductions thanks to reductions in scope 2 - emissions from purchased electricity. However, in many industries electricity is not the primary use of energy.

In society, 50% of energy use is used for heat and in industries the figure can often be significantly higher.

The industrial sector accounts for about 31 % of the world's total energy consumption and 70 % of the industry's energy demand is heat for industrial processes.

By reducing Scope 1 emissions, the direct emissions from sources that are owned or controlled by the organization, business can maintain the reduction in emissions, and at the same time improve energy efficiency in the facility.

RENEWABLE HEAT SOLUTIONS

WE HELP INDUSTRIES MAKE THE CHANGE FROM FOSSIL FUELS, PROVIDING A COMPETITIVE AND CLEAN HEAT SOLUTION USING SOLAR THERMAL RESOURCES.

Through 20 years of research, Absolicon has developed world-leading solar thermal technology with the highest optical efficiency ever measured for its kind and the world's first Solar Keymark certified solar concentrator.

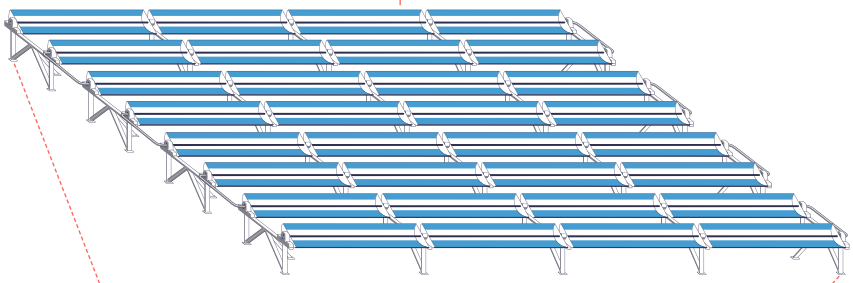
A solar thermal energy system convert solar energy directly into heat and can reach temperaturers of up to 160°C (320°F) and pressures of up to 8 bar for multiple applications in different industrial sectors. The heat can then either be used for generating steam, or be feed directly in industry process stages.

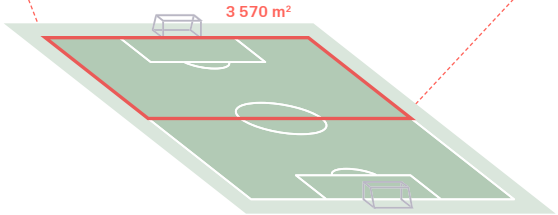
Depending on the conditions of the facilities where the technologies will operate, a collaboration of heat technologies is often recommended.

Absolicon provide a customized integration between technologies combined with heat storage that can optimize the price and overall system performance.

YEARLY
FOSSIL FUEL
SAVING
with production from a 1 MWp field

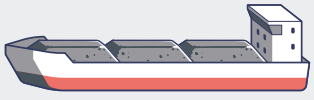
3 570 m²
=
1 MWp
with solar collectors



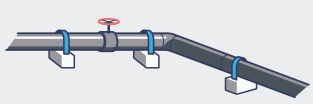


Oil 250 000 liter

Firewood 600 tons



Brown coal 500 tons



Gas 300 000 m³

(1) In tests at The Swiss Institut für Solartechnik (SPF) in Rapperswil Absolicon T160 Solar collector has shown to have an efficiency of 76,6 %. The highest number ever achieved for a small parabolic trough.

THERMAL ENERGY STORAGE

THERMAL ENERGY STORAGE, IN THE FORM OF "HEAT BATTERIES", STORES EXCESS HEAT THAT CAN BE USED TO REDUCE PEAK LOADS OR INCREASE THE SHARE OF RENEWABLE ENERGY IN THE PLANT.

A heat battery is a system used to store and release heat energy depending on demand. The heat can be stored throughout the day, weekly, or even seasonally.

A thermal storage optimizes energy costs by providing heat directly to the process without the need for conversion. This system allows higher fuel savings, lower CO_2 emissions, and higher economic savings for industries.

A heat storage, or “heat batteries” can be charged with, for example, solar energy during the summer and stored seasonally to reduce peak loads during the winter.

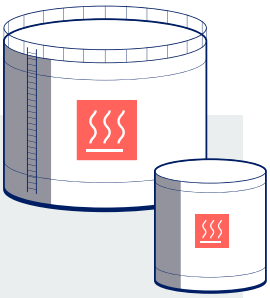
The storage can also be charged with heat from heat pumps in the event of low electricity prices.

For industries operating 24/7, all year round, a heat storage enables an opportunity to stabilize both the supply and cost of heat. This reduces exposure to price fluctuations or shortages and strengthens competitiveness.

BENEFITS

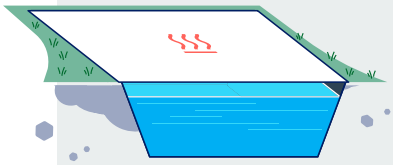
- Reduce peak thermal demands and increase system efficiency.
- Increase the share of renewable energy by charging with sustainable energy sources.
- Reduce fuel costs by charging the heat storage when prices are low.
- Secure a stable supply less exposed to price fluctuations or shortages.
- Reduce CO_2 emissions with solar heating or heat pumps.

TECHNICAL SOLUTIONS



TANK

- Store heat for daily useage.
- Reduce peak power of other heat generators.

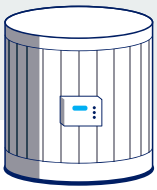


PIT

- Long-term or seasonal thermal storage.
- Use surplus energy weeks or months later.

PCM - PHASE CHANGE MATERIAL

- High energy density & compact.
- Absorbing & releasing energy when solid or liquid state are changing.



Click or scan the QR-code to learn more about thermal energy storage

https://www.absolicon.com/solar-thermal-energy/thermal-energy-storage/

HOW DOES IT WORK?

A Heat battery is a system used for storing and releasing thermal energy. Heat Batteries can be classified into different types according to your demand, both designed to provide sufficient capacity to absorb that surplus and release a significant share of it later with low energy losses over time.

SHORT-TERM STORAGE

Short-term thermal energy storage is used when the energy demand should be satisfied, for example, cloudy days or nights. The most common short-term storage method is the displacement of hot/cold water via accumulator tank storage. The volume of the tanks varies from a few hundred cubic meters to tens of thousands. There are two main types of tanks, pressurized and atmospheric (non-pressurized) tanks.

LONG-TERM STORAGE

Long-term or seasonal thermal energy storage is indicated for long-term applications such as storing summer heat for winter heating or winter cold for summer air conditioning. Seasonal thermal storage has traditionally been tied to solar heat, allowing the surplus energy in summer to be displaced in the winter, when demand is high and supply low. Four types of large-scale or seasonal thermal energy storage are commonly used worldwide. The four storage concepts include tank and pit thermal energy storage (TTES and PTES), borehole thermal energy storage (BTES), and aquifer thermal energy storage (ATES).

SOLAR HEAT WITH HEAT STORAGE

Solar thermal in combination with heat batteries is a technical and economically feasible solution that avoids spillage of solar heat, making the technology even more cost-efficient. This is further enhanced by the fact that the heat in the battery can be used directly in the process without the need for conversion from another form of energy.

Implementing a heat battery to your system in combination with solar heat, makes it possible to meet a large portion of heating demand with solar heat and improve the energy efficiency of the plant.

APPLICATION

SOLAR THERMAL ENERGY IS THE IDEAL ENERGY SOURCE FOR A RANGE OF PROCESS STAGES IN SEVERAL INDUSTRIES. THE ENERGY IS TRANSFERRED TO THE PLANT VIA A HEAT EXCHANGER WHERE IT EITHER IS USED FOR GENERATING STEAM, OR FOR HEATING A HEAT TRANSFER FLUID OR A PROCESS FLUID.

	Beverage	Chemicals	Cooling	Dairy	Desalination	District Heating	Food Processing	Mining	Pharmaceutical	Pulp & Paper	Tea	Textile
Bleaching										●		●
Boiling	●	●					●			●		
Cleaning in place (CIP)	●	●		●			●					
Cooling	●		●			●	●					
Distillation	●	●		●			●		●			
Drying	●	●		●			●	●		●	●	●
Heat Treatment		●										
Hot Water	●	●		●		●	●	●	●	●	●	●
Pasteurization	●			●			●					
Multi-Effect Desalination					●							
Sterilization	●			●			●		●			
Washing	●			●			●	●		●	●	●

TRUSTED PIONEERS

ABSOLICON HAS MORE THAN TEN YEARS OF OPERATIONAL EXPERIENCE AND OVER 20 INSTALLATIONS WORLDWIDE, WORKING WITH PIONEERS LEADING THE WAY FOR A SUSTAINABLE INDUSTRY.

ABB

COLGATE-PALMOLIVE

Tetra Pak

PEPSICO

Carlsberg Group

Teeling PETFOOD

BIRRA PERONI 1846

Asahi

PHOENIX SOLAR THERMAL INC.

itc INSTITUTO TECNOLÓGICO DE CANARIAS

HÄRNÖSAND ENERGI & MILJÖ

OLYMPIC BREWERY S.A. Part of the Carlsberg Group

SIEMENS

Regeringskansliet

Nett Zero Heat Concentrated Solar Power

OUR TECHNOLOGY

BASED ON MORE THAN 20 YEARS OF RESEARCH AND DEVELOPMENT, THE ABSOLICON T160 IS A STATE-OF-THE-ART SOLAR COLLECTOR WITH RECORD-HIGH PERFORMANCE. IT'S CERTIFIED WITH SOLAR KEYMARK AND ICC-SRCC, PROVING ITS HIGH RELIABILITY AND QUALITY, AND THE TECHNOLOGY IS PROTECTED BY SEVERAL PATENTS.

OPERATING TEMPERATURE
40-160°C (100-320°F)

MAX STEAM PRESSURE
up to 8 bar (115 PSI)

PRESSURE RATING
16 bar (232 PSI)

OPTICAL EFFICIENCY
76 %

COLLECTOR SIZE (LXWXH)
5,514 x 1,095 x 347 mm

WEIGHT
148 kg

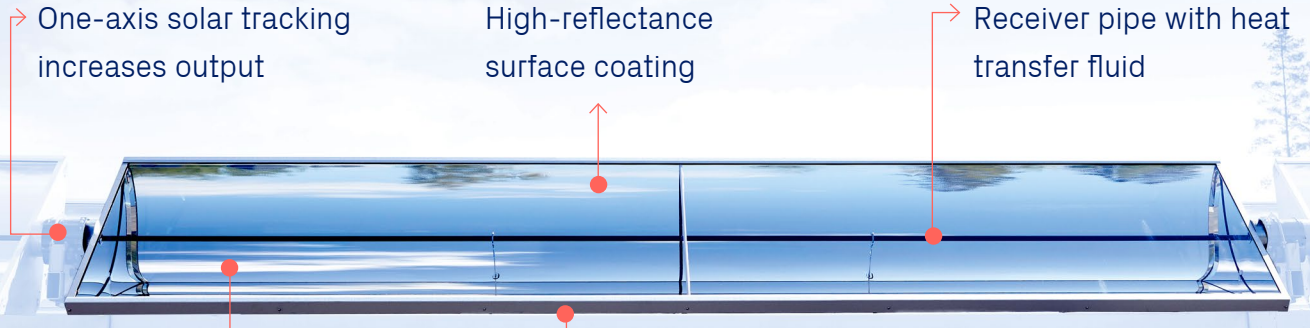
EXPECTED LIFETIME
25 years

DYNAMIC LOAD
90 kg/m^2

ICC-SRCC CERTIFICATION NUMBER
Reg. no. 10002145

SOLAR KEYMARK CERTIFIED
Reg. no. 011-7S2902C

PEAK ENERGY GENERATION
700 W/m^2 aperture area
under optimum conditions



Reg. no. 011-7S2902C

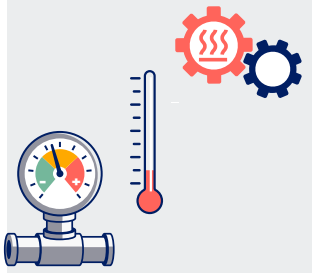
Reg. no. 10002145

PLANT DASHBOARD

DESIGNED FOR REMOTE MONITORING OF THE PERFORMANCE OF ABSOLICON SOLAR INSTALLATIONS, THE PLANT DASHBOARD ALLOWS YOU TO GATHER, LOG, AND MONITOR OPERATIONAL DATA FROM YOUR SOLAR FIELDS AROUND THE WORLD, ENABLING SIMPLIFIED ACCESS FROM MULTIPLE DEVICES SUCH AS COMPUTERS, MOBILES, OR TABLETS.

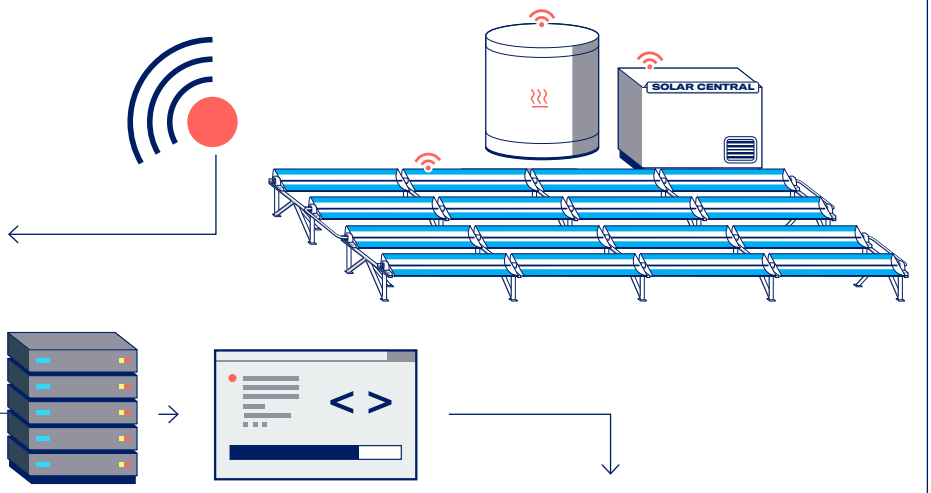
With Absolicon dashboard features you will be able to monitor and evaluate the energy production of your applications and many other customizable KPIs.

The dashboard is designed for remote monitoring of the performance of absolicon solar installations around the world, allowing you to gather, log, and monitor operational data from your solar fields.



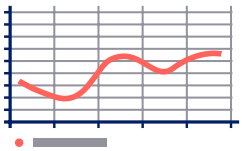
SENSORS

Real-time data, like pressure, temperature and energy production etc, are collected in the database, compiled and presented in the interface.

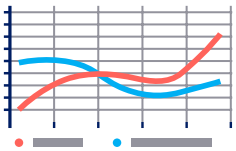


KEY PERFORMANCE INDICATORS - KPI

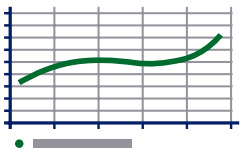
REALTIME



HISTORICAL



CUSTOMIZED



THE INDUSTRIAL HEAT JOURNEY

TOWARDS ENERGY SECURITY WITH SOLAR THERMAL

1 ORIENTATION

OVERVIEW

Exchange information to receive a conceptual design and a cost estimation.

PROCEDURES

- **NDA**
  Sign Non Disclosure Agreement between the parties.
- **LOCATION**
  Identify the location.
- **SPECIFICATIONS**
  Gather basic load profile and application specs.
- **CONCEPTUAL DESIGN**
  Development of the conceptual design.

DELIVERABLES

- **BASIC INTEGRATION DIAGRAM**
- **PERFORMANCE**
  Solar field performance simulation.
- **COST ESTIMATION**
  Price Level Class 4:
  -20% to +50%

2 FEASIBILITY STUDY

Absolicon will perform a feasibility study with budgetary price.

PROCEDURES

- **RECEIVE PO**
  Receive Feasibility study purchase order.
- **SITE VISIT**
  Energy engineers visit the site.
- **GATHER DATA**
  Gather in-depth data.
- **IDENTIFY**
  Identify the apt location for installation & possible integration points.
- **DESIGN**
  Design an optimal solar thermal solution.

DELIVERABLES

- **ENERGY MAPPING**
- **DETAILED DESIGN**
- **BEST INTEGRATION SCHEME**
  And system performance.
- **PRELIMINARY SYSTEM LAYOUT**
- **SCOPE OF SUPPLY**
- **COST ESTIMATION**
  Price Level Class 3:
  -15% to +30%
- **HEAT AS A SERVICE MODEL**
- **ROAD MAP**
  Road map for 100% renewable heat solution.

3 DESIGN

With a LOI based on the budgetary price, the final design will be developed. Absolicon will provide the final technical and economic review.

PROCEDURES

- **LOI**
  Sign the letter of intent between parties.
- **FINAL DESIGN**
  - Foundation
  - Solar Field
  - Solar Central
  - Pipe route
  - Integration point

DELIVERABLES

- **TECHNICAL AND ECONOMIC REVIEW**

4 INSTALLATION

With an official order signed by both parties the project will start, and the installation phase begin.

PROCEDURES

- **PURCHASE ORDER**
- **INSTALLATION**

MEET THE TEAM

OUR EXPERT TEAM IS EXPERIENCED AND READY TO WORK CLOSELY WITH YOU TO IDENTIFY AREAS WHERE ENERGY EFFICIENCY CAN BE ENHANCED AND RENEWABLE ENERGY SOURCES CAN BE INTEGRATED.

When choosing a renewable heat solution, it's critical to consider the type of technology you'll use.

Not sure which option best fits your production needs? No problem, we're here to help! Our expert team is experienced in working closely with companies to identify areas where energy efficiency can be enhanced and renewable energy sources can be integrated.

Over the past 20 years, Absolicon has been developing high-quality solar thermal systems. These systems, powered by our advanced technology, function effectively even in challenging environments, producing not just heat but also steam and cooling as needed.

The quality of our systems is verified by the numerous certificates they've garnered. These certificates demonstrate our commitment to providing reliable and eco-friendly solar solutions that prioritize safety, sustainability and profitability.

Regardless of the unique features of your site, our flexible solar field solution can be adapted to fit. Our partnerships with respected vendors ensure seamless integration and reliability of your heating system components.

At Absolicon, we believe in taking small steps today towards a sustainable future, and we're here to guide you on this journey.

We're here to help you design a 100 % cabon free heating system combining different sustainable energy sources in the most optimized way due to your conditions.

Learn more about the different Absolicon solutions by following this QR,

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REVOLUTIONIZING HEAT SUPPLY

At Absolicon, we are committed to the transition to renewable heat. We help industries change from fossil fuels, providing a profitable, easy-to-install, and emission-free energy solution using solar thermal resources.

Absolicon was established in 2005 as a research and development company in solar technology. Today, Absolicon is a publicly listed company with more than ten years of operational experience from all parts of the world.

ABSOLICON

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