



Solar Thermal Energy Contracting
Sustainable and Cost-Efficient
Process Heat on Demand



Protarget AG

About protarget AG

- Protarget AG founded in 2009, is specialised in the design and production of **Concentrating Solar Thermal (CST) Systems**
→ Supply industrial customers with **process heat** and **steam**
- With manufacturing partners in Europe, India and Chile
- All equipment designed in accordance with the applicable standards and norms, especially:
 - The European pressure directive (PED)
 - Machinery directive
 - Eurocode and ASME standards
- Our technology is qualified by the German Aerospace Centre (DLR) and the design approved by TÜV Germany
- CST plants in **Germany, Cyprus, India** and **Brazil** in operation. With further projects in **Greece, Cyprus, Spain, Morocco** and **Saudi Arabia** at an advanced stage



➤ Germany



➤ India



➤ Cyprus

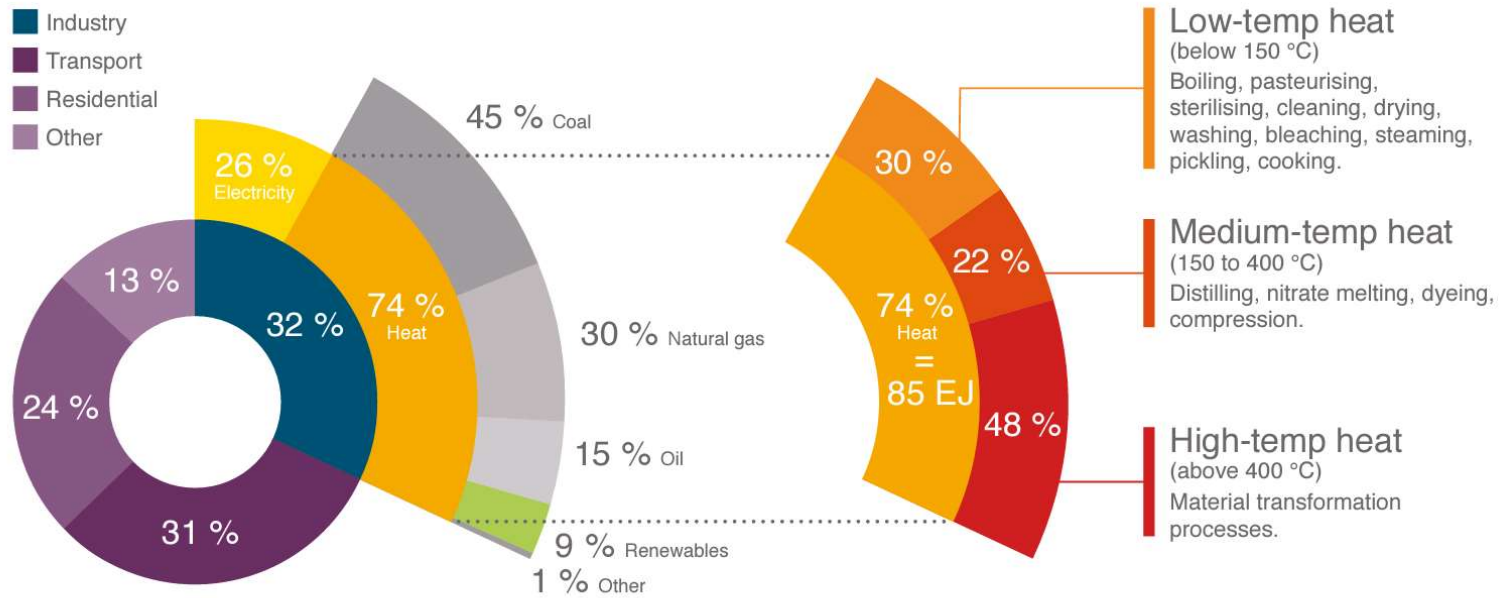


➤ Brazil



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Global Heat Demand in the Industry



TOTAL FINAL ENERGY CONSUMPTION 2014: 360 EJ (EXAJOULE, see Glossary page 17); IEA [1]

IRENA [2]

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Applications for Solar Process Heat Generation



Food and beverage industry:

- Breweries, wineries, juice producers, distilleries – Steam juicing, sterilisation, distillation
- Dairy's and bakeries - Drying, cleaning, cooking, deep frying, baking, pasteurisation
- Slaughter houses – Rendering process, steam cooking, cooling and refrigeration

Product industry:

- Pharmaceutical and chemical industry - Process specific applications, distillation
- Consumer goods – Soap, laundry detergent
- Plastics and rubber industry - Heating, cooling, vulcanisation
- Textile and leather industry - Dying, shaping, ironing, tanning
- Cement and ceramic industry – Drying, burning, calcination
- Paper industry – Bleaching, thermo-mechanical pulping, drying
- Surface and heat treatment – Phosphating, de-greasing, galvanising

Mining and oil industry:

- Ore leaching, galvanic processes, drying, cleaning

Hotel and tourism industry

- Laundry, heating, cooling, water treatment and desalination



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Proven Technology for Industrial Process Heat



- Vacuum Tube Systems (CPC)
 - **Hot water** of up to **100°C**
 - Very short amortisation time : **3-6 years**
 - Roof or ground mounting possible
 - Typical project size: 100 kW – 5 MW_{thermal}
- Parabolic Trough Systems (PTC)
 - **Steam** or **thermal oil** of up to **420°C**
 - Very short amortisation time : **2-5 years**
 - Ground mounting
 - Lifetime 20 years and more
 - Typical project size: 250 kW – 20 MW_{thermal}
 - Designed for harsh climatic conditions

→ **Ideal for industrial applications**



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Why Energy Contracting?

- The limited number of Solar Thermal Projects in Europe and the necessary investment cost to install the technology is seen as a technical and financial risk to some industrial customers
- There are also reservations from the technical people in the factories on how to operated such plants as they are used to conventional gas and oil boilers
- These factors have led to alternative business models, for example energy contracting. Providing solar thermal energy to an industrial costumer on basis of a long-term energy contract
- Energy Contracting is limiting the technical, operational and financial risk to the customer .
- Energy contracting on corporate level is an established business model in the industry with PV systems providing electricity or combined heat & power plants providing thermal and electric energy.
- In a contracting model, Protarget is responsible to design, build, finance, maintain and operate the plant (DBFMO) on the basis of a TPA (Thermal Purchase Agreement).
- The TPA is a bilateral contract defining the conditions and the duration of the supply, including a guarantee for the amount of energy provided by the solar system, as well as for the energy taken by the customer



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Advantages of Energy Contracting?

- No significant investment required, no liquidity restrictions
- Performance guarantees minimising technical and financial risk
- Energy contracting enable easier and faster decision process (management level) compared to investment decision (cooperate level)
- Customer can claim to have incorporated a sustainable technology into its production process and benefit from the CO₂ savings to achieve its own cooperate sustainability goals by freeing up CAPEX necessary to realize other sustainability carbon neutral goals
- No O&M responsibilities, reducing operational risk
- Financial investors who participate in such an ESG investment, are able to achieve a solid revenue stream over 10-20 years with an IRR of 10% and more
- Customer has the option to purchase the plant before the end of the contract and benefit from the reduced energy cost





Your Advantages

Summary

Green Energy

The technology allows you to generate industrial process heat **100% green and CO2 free!**

Cost Advantages

Process heat is generated up to **80% cheaper** compared to conventional fuels

Instant effect

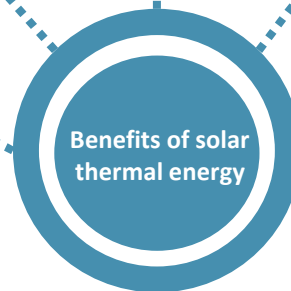
Our customers benefit from **immediate cost advantages** and a significant reduction in CO2 emissions


Long Lifetime

Designed to **last in deserts 20 years** and more, protecting you from the inevitable price increase of fossil fuels and other externalities such as carbon tax

Contracting Model

Protarget offers a **Leasing** model and **Energy Contracting** for the supply of thermal energy





**„To help industries to switch from fossil
fuel-based process heat
to sustainable solar thermal alternatives “
Protarget AG**

Discover Protarget's latest Solar Energy Solution for the Industry

www.protarget-ag.com