



Power generation

Harness the sun. With cost efficient protarget solar power plants.





## Potential

“Within **6 hours**, deserts receive more energy from the sun than humankind consumes within a year.”

Dr. Gerhard Knies, DESERTEC Foundation

## Sunlight is free energy

### We put it to work

The sun - the, most dependable and least expensive energy source in our universe. Its solar radiation constitutes a limitless supply of energy and virtually inconceivable power. It could meet the global energy demand for 180 years - in just a single day. Now, your company can tap this resource using our ultra-efficient solar power plants.

Our plants require minimal logistic overhead and can be customized to fit your individual needs. Their cost/benefit ratio is excellent: electrical generation costs, depending on location, of less than € 0.15/kWh make them a serious competitor to fossil fuels. And they become a better investment with every increase in oil and coal prices.

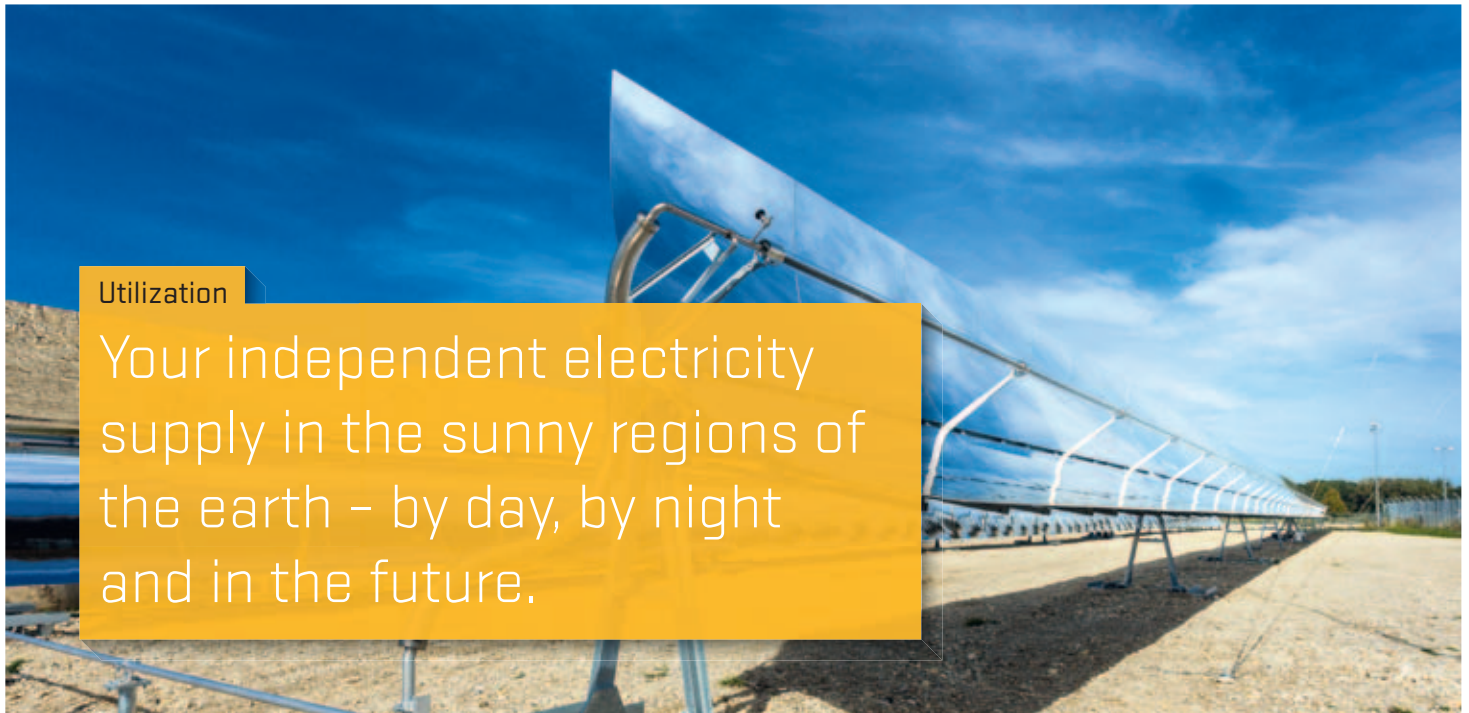
### How it works

Our power plants employ solar thermal technology. The principle is similar to that of a burning glass. Concave mirrors focus the sunlight on a tube containing a heat transfer fluid heating it to around 400°C. This is used to produce steam, which in turn generates electricity. This process, known as Concentrating Solar Power (CSP), has proven itself in practice for over 25 years. Our innovation is that we have made this technology feasible and economic for large-scale consumers. With cost-effective, easy-to-maintain, turn-key power plants.

### All advantages at a glance

- Energy autonomy for your company
- Low electricity generation costs, with no fuel expenses
- Long-term cost stability through predictable energy costs
- Technology and components made in Germany
- Power plant sizes individually scalable
- Minimum planning and logistics overhead
- Low operating and maintenance costs
- Heat storage for continuous power generation
- Additionally usable for process heat, cooling, air conditioning and desalination





### Utilization

Your independent electricity supply in the sunny regions of the earth – by day, by night and in the future.

## Solar thermal power

### In the final analysis, there is no alternative

Our power plants stand for economical, future-proof energy supply. They make you independent of the local power grid and its outages, decoupling your business from future increases in electricity and fuel costs – the sun always shines for free.

Unlike photovoltaic systems, our power plants can use their heat storage capability to supply energy at night, whilst during the day the mirror modules track, the sun allowing them to collect up to 30% more energy.

These unique features mean that you can generate the energy you need, when you need it.

### Ideal for many applications

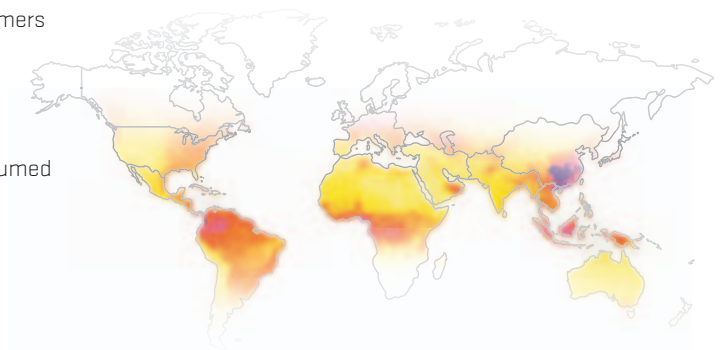
The ideal sites for our power plants are to be found in every continent, especially in India, the MENA region – the Middle East and North Africa – as well as in South Africa. These regions offer the optimum climatic conditions for solar thermal.

- The energy needs of the population and large-scale industrial consumers are expanding rapidly
- Additional process heat and cooling are highly attractive for the textile, food and machine tool industries – to name just a few
- According to the International Energy Agency (IEA), 11% energy consumed globally by 2030, will be produced by CSP

### Usable solar areas



Deserts are an ideal environment terrain for high-performance solar thermal. Our 1 MW power plant generates 2.2 Million kilowatt hours per year – enough to supply 500 households with sustainable energy – on an area equivalent to just five football fields.





## Solutions

The technology has been proven for decades. Our power plants finally make it commercially usable.

# Electricity from solar thermal power

## Independent energy supply, with electricity on demand

Our solar thermal power plants are straightforward to set up, dependable in operation and customised to meet your individual needs.

- Power plant capacity scalable from 1 to 20 MW
- Night or bad-weather operation ensured by integrated heat storage unit
- Additional generation of process heat, cooling and seawater desalination possible
- Hybrid operation possible if desired using supplementary gas or oil burner or biomass
- Short planning and construction times of no more than 12 months
- All components made in Germany
- Power plants assembled by protarget's technicians and handed over as turn-key installations
- Fully automatic operation for low operating costs
- Minimum maintenance overhead (mirror cleaning)

# A plant that pays off

## Extraordinarily low operating costs

Solar thermal turns the rules of conventional power plants on their head. Normally, fuel and maintenance account for 80% of the total costs of a power plant. In a solar thermal power plant, by contrast, these make up just 20%. Your initial investment is amortized continuously and dependably.

## Large local content portion

With our power plants, you have the possibility of achieving even greater cost advantages by utilizing local content in the construction of foundations, the erection of steel structures and the assembly of the solar modules.

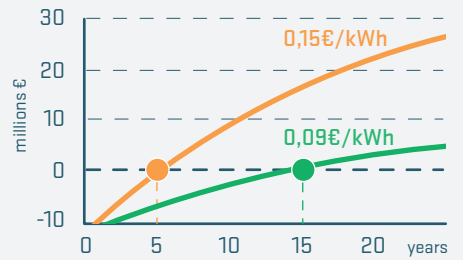
## Long-term cost stability

Today, it is globally acknowledged that fossil fuels can only become scarcer, and thus more expensive. But the „fuel“ of a solar power plant will always be free. The costing of the installation is predictable in the long term, as the maintenance costs are extremely low and its components are durable and easy to replace.

## Positive spill-over effects for your marketing

Solar thermal energy is totally environmentally friendly. Your power plant generates electricity without emitting CO<sub>2</sub> or producing radioactive waste. With solar thermal, you set new standards for sustainability - and can use this for your marketing.

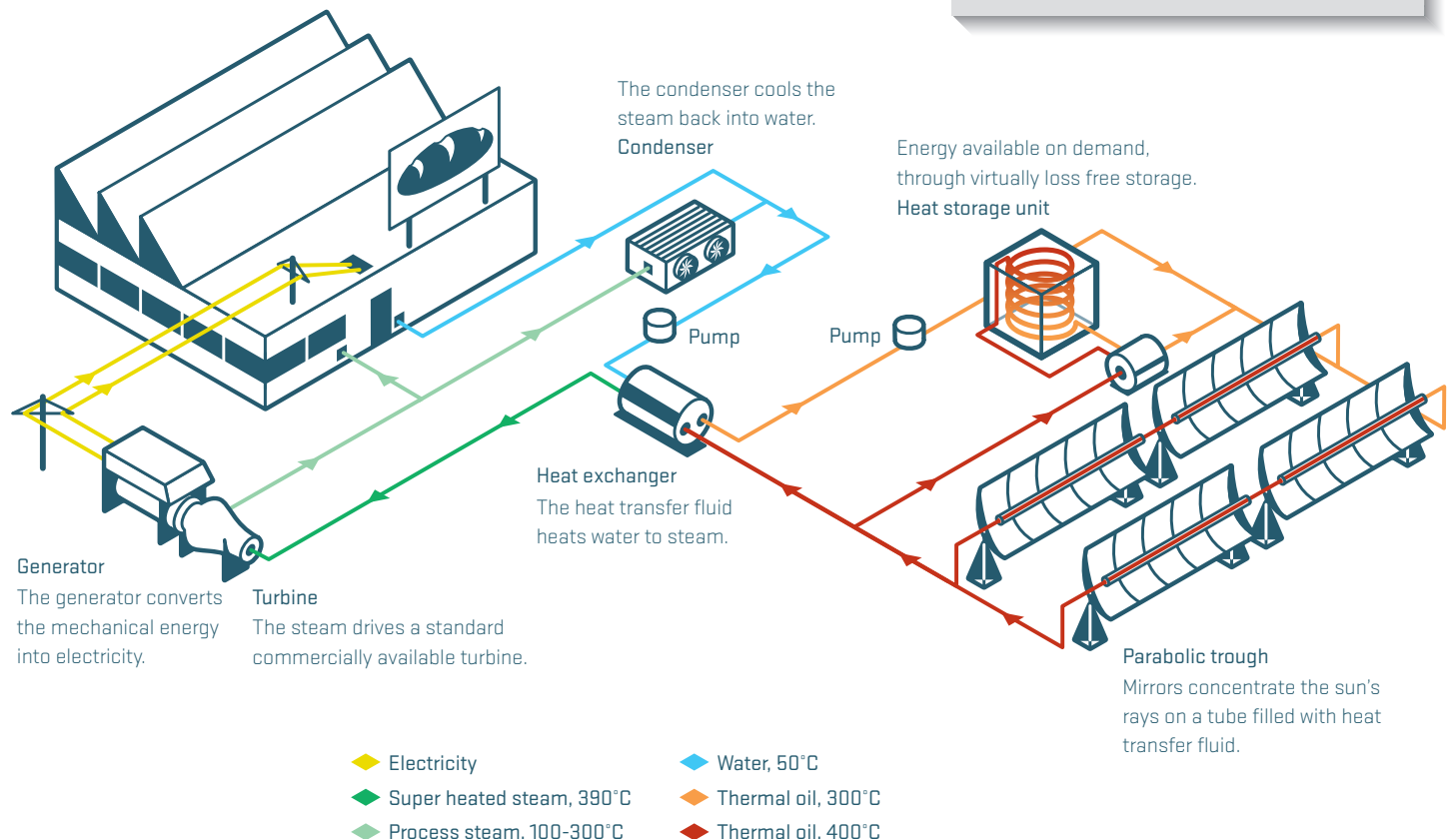
### Break-even



Assuming the price of oil remains constant, your investment in our solar installations will be amortised in 5 to 15 years depending on the site.

### Our power plants by the numbers

- Levelised cost of electricity generation (LCOE) below € 0.15/kWh.5 M€/MW
- 30% greater yield compared to conventional photovoltaic
- Autonomous energy supply 24/7
- All components designed to last 25 years in desert environment
- Construction and commissioning in under 12 months





**Mission**

Our know-how and technology makes solar energy generation economically feasible.

## Our enterprise

### Who we are and what we do

We believe that in regions where sunshine and land is available in sufficient quantities, solar thermal is the best and most economical method of energy generation. Our know-how and experience, in combination with modern production technologies from the automotive industry, makes this technology commercially successful. We founded protarget AG expressly to establish the large-scale use of solar thermal heat and electricity generation as an economical and affordable technology.

We understand the conditions and requirements that a solar thermal power plant needs to fulfil in a desert environment, over period of 25 years and more. Benefit from engineering made in Germany, with the experience of power plant projects around the world. We are supported through technology transfer of the solar thermal research institute of the German Aerospace Centre (DLR) and our collaboration with numerous industrial partners.

## Our technology partners



## Contact

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## Sample calculation



Is solar thermal right for you?  
Fill out our quick-check form at [www.protarget-ag.com/quick](http://www.protarget-ag.com/quick) and we will calculate your project within 48 hours.

## Site visits in Germany

Located close to Munich, Germany, one of our systems can be seen in operation at the zero emissions development - City of Wood. You are cordially invited to visit this site and see CSP technology in operation.