

CLEANERGY

STIRLING CSP SYSTEMS

A bright new
future for
solar power



ELECTRICITY AT GRID-PARITY LEVELS

A CSP system with a difference

The SunBox is part of Cleanergy's Stirling CSP System™ that generates power from solar energy twice as efficiently as traditional Photovoltaic (PV) technology.

Thanks to a proprietary tracking system that follows the sun throughout the day, the SunBox has a higher yield than alternative technologies resulting in electricity produced at €0.06/kWh – the lowest in the market. Yet, it doesn't require water for cooling.



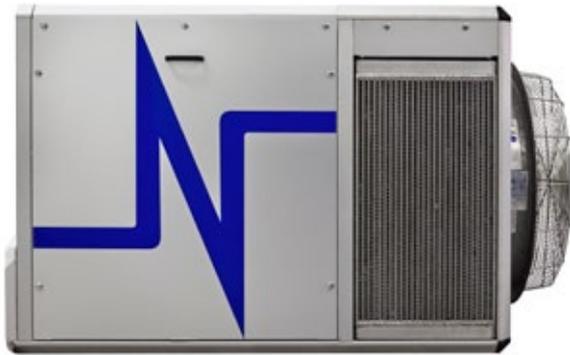
In designing our Stirling CSP System we thought outside – and inside – the box. The result is a turnkey solution that not only includes the SunBox but is also supported by a family of services from design and installation, to round-the-clock maintenance and troubleshooting.

Bottom line: Our CSP technology is proven to be twice as efficient as PV technology for utility-scale solar parks – both on and off grid. Genuine bright science in action.

Who are We?

We are the world's leading supplier of sustainable stirling energy solutions with installations from Norway to Inner Mongolia, Dubai and the UK. Headquartered in Sweden, our (former Volvo) production facility is built around the latest lean manufacturing principles and is supported by a network of automotive-grade suppliers and partners – all of which guarantees quality and security of supply.

Meanwhile, our blue-chip level board includes the current chairman of the Swedish Trade Council and the former Swedish finance minister. Our investors include the renowned Wallenberg family of industrialists, along with the Nobel Foundation.



THE STIRLING ENGINE

From one Industrial Revolution to another

The stirling engine was invented in 1816 amidst the white heat of the Industrial Revolution.

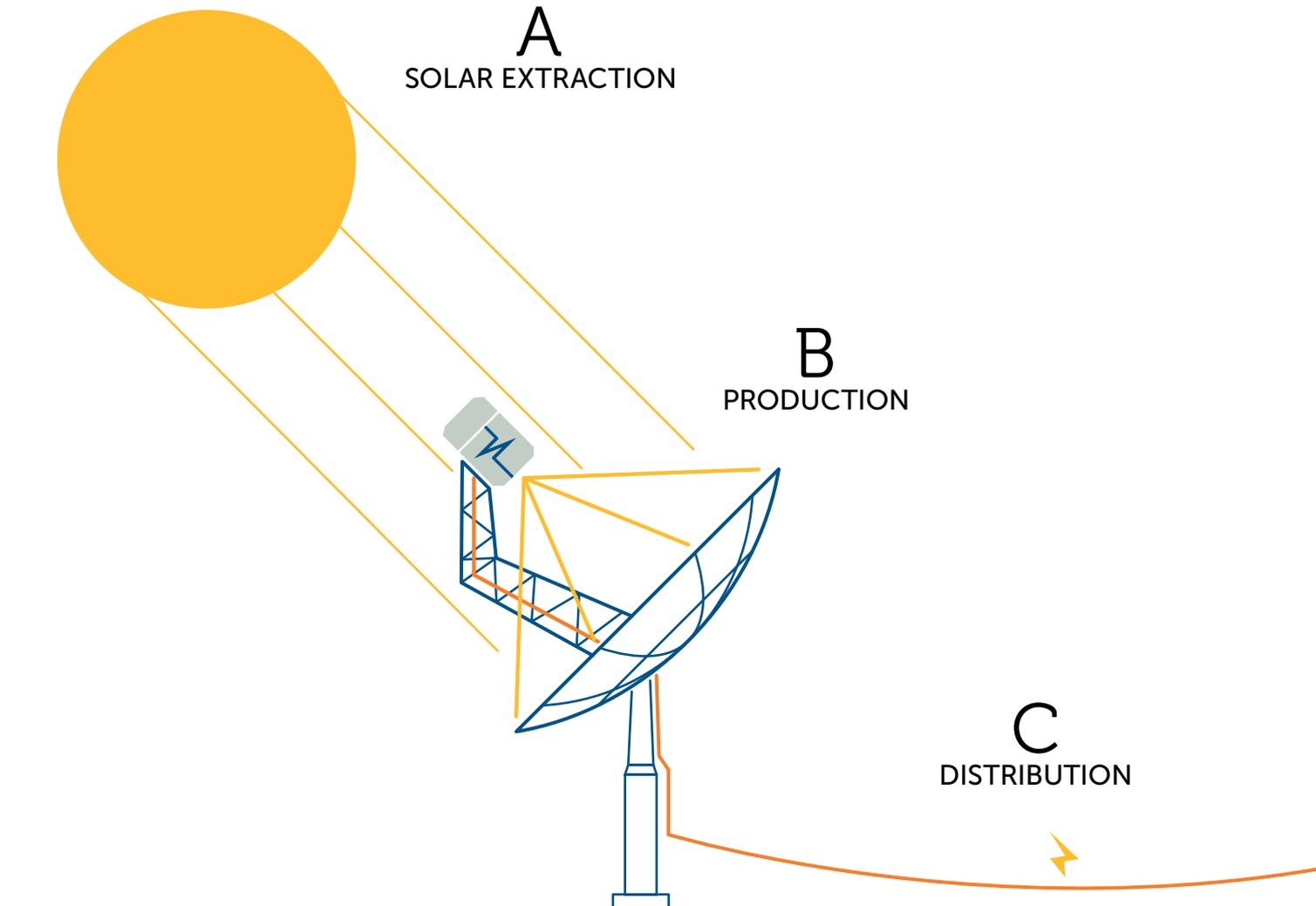
In recent years, stirling technology has seen a resurgence with companies looking to harness some of its unique benefits, including fuel independency, low vibrations and long-term durability – which have been used in various

applications, from powering submarines to cryogenic cooling, to cogeneration and concentrated solar power.

At Cleanergy, we have spent 25 years perfecting our Stirling CSP System™. It's proven to perform. Its durability and reliability is beyond doubt. And its potential is enormous.

How does it work?

With the Cleanergy Stirling CSP System™ solar parks can convert solar energy into electricity twice as efficiently as PV technology. But uniquely, it produces power without the need for water consumption.





SUNBOX

A Bright New Star

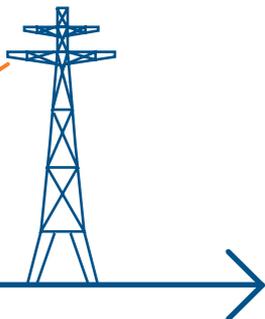
SunBox is not like other stirling engines or generators.

It's twice as efficient as PV because of its ability to track the sun all day and retain peak power for far longer.

This makes SunBox unique in its ability to produce electricity at grid parity cost levels with no long-term power degradation.

Yet, this is the only CSP system that doesn't require water for cooling – good for both planet and profit.

By offering maximum solar power extraction per square meter compared to traditional CSP systems, the SunBox generates 100% clean power at peak efficiency from sunrise to sunset.



SUNBOX

Proven Performance

Mounted on reflective parabolic dishes that follow the sun, our 11kW SunBox stirling engines produce renewable power on several continents – every day.

In Spain, for example, our technology has been installed since 1992 at Plataforma Solar de Almería, with more than 35,000 operating hours.

SunBox is also being used successfully in commercial solar parks in the Middle East and China – where we also have a commercial demonstration site in the Inner Mongolian desert at Ordos that has consistently produced a peak energy performance of 10% beyond our predictions.

Meanwhile, at our demonstration site in Åmål, Sweden, various independent authorities have evaluated the on-site performance (data available). Again, we underestimated the performance of SunBox. In some cases we have proven a cost reduction potential of up to 50%.

What's included in the CSP System?

Mounted on top of a parabolic dish that tracks the sun, the SunBox is an autonomous and flexible stirling engine unit. Cleanergy's Stirling CSP System includes both the SunBox and the parabolic dish – plus a tracking system with remote access. The system also includes a portable service unit and the potential for both off-grid and on-grid applications. Power output is capped at 11kW per SunBox unit.



Looking Ahead

The roadmap for our success began before there were any real roads – in 1816. Nearly 200 years later the future for our stirling-based technology looks bright.

We have had a commercial organisation in China since 2011 and plan to expand aggressively with a high-volume production facility in the works; plus development plans for SunBox in Europe, Middle East and South Africa.

Our ultimate goal? To make renewable stirling solutions a major, lasting part of global power generation. If you share that goal...

Why not be part of it?

Contact us today to discover how SunBox and Stirling CSP technology can help benefit people, planet and profit.

E-mail to msp@cleanenergy.com to get in touch with a sales representative. Or give us a call at + 46 532 10020.

More information available at WWW.CLEANERGY.COM





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