

Ener-t International Ltd.



# Bankable Thermal Solar Power Generation Technology (CSP)

30 Years of Proven Experience





## 30 Years of Experience

Drawing on a strong solar power generation heritage spanning for more than three decades, Ener-t International's solar thermal power plant designs deliver proven performance and reliability, creating successful projects with superior annual production.

Since the early 1980's, our team has led the R&D, design, engineering, construction and O&M work for three generations of the original parabolic trough technology used in the landmark **354MW SEGS projects in California**.

The people of Ener-t were directly responsible for all aspects of the parabolic trough technology which continue to be used until today in the majority of CSP projects all over the world. Members of our team have also developed, built and operated the unique production lines of the key solar field components used in the SEGS projects, including the Heat Collecting Element and the Collector Assembly.

## Projects - Europe

Our passion has not subsided in our quest to promote the adoption of parabolic technology as we continue to participate in the Engineering Procurement and Construction (EPC) work of projects, such as **3 X 50 MW (150MW) of Euro 1 billion projects in Spain**, which already entered operation successfully. Based on our experience from the SEGS projects, Ener-t has served as a Technology Provider supplying the core engineering design, conceptual design and selection of key components for these state of the art projects that were design to also include thermal energy storage system for extended electricity supply and manageability.

## Projects - Asia

Ener-t International serves as an EPC Contractor and Technology Provider in several multi-megawatts projects under construction and in development in Asia. In India, Ener-t is in advanced staged in the executing of the EPC work, under consortium with local EPC company, for a **50MW thermal solar project** approved under phase 1 of the Government of India.

Ener-t was selected recently also for the design of the **National CSP R&D center at Jodhpur, Rajasthan, India**.

## Harnessing the Power of the Sun

With rising fuel costs, climate change concerns and an ever increasing demand for electricity, renewable energy resources such as solar power are becoming an increasingly valuable part of the global energy mix.

The market is growing. Around the world, power producers, businesses and homeowners are harnessing the power of the earth's most abundant natural resource - sunlight - to provide clean, renewable energy.

Various technologies exist for converting thermal solar energy into usable power, yet only our SEGS based parabolic trough technology has a proven decades-long track record of delivering cost-effective, bankable, large scale projects that can replace conventional power plants.

Ener-t International continues to improve the technology, increase efficiency to raise the net electricity being sold, dramatically cut project costs and has lead the way in delivering competitive, inexhaustible, environmentally benign electricity - using power from the sun's rays.

## ES-3.5 – New Generation Solar Field

Ener-t has recently developed its most advanced next generation model for the solar collector called the ES-3.5, which gives the best price to performance ratio for this critical solar field component. This has been achieved through innovations related to the collector structure, hydraulic drive system, and engineering process design and guided by proprietary modeling techniques.

The ES-3.5 collector was developed based on the successful LS-2 collector used by our own engineers in the SEGS projects. The new collector was manufactured, and supplied to our 50 MW project located in Rajasthan India.



Kramer junction – view of the solar field from the SEGS project

## Parabolic Trough Technology

To this day parabolic trough is the only commercially proven solar thermal concentrating technology. With Ener-t's design and technology, it is straightforward to implement and has demonstrated efficient, stable and reliable operation for decades. These systems can also be combined with state of the art thermal energy storage systems and auxiliary fuel backup for round the clock operation. Ener-t's most advanced design allows for over 19% solar to electric annual efficiency in many locations worldwide.

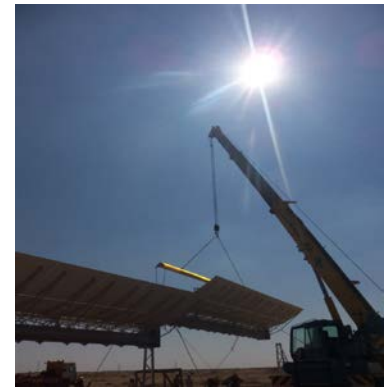
## Qualified Technology Provider

Ener-t is a qualified and 'bankable' technology provider based on our vast experience spanning decades in the supply of technology, EPC and O&M services for the SEGS solar thermal power plants located in California.

Those nine parabolic trough power plants have set the current technology standard and have a total capacity of 354 MW that has been generating electricity continuously since 1984 to supply reliable power to more than 200,000 homes.

## Global Reach

Ener-t is the technology partner of choice of power producers engaged in the development, construction and operation of thermal solar power generating plants. As an experienced thermal solar company, Ener-t is committed to building the most efficient and economical projects possible from the start. Ener-t continues to develop its technologies and design in order to further improve operations and plant efficiencies, reduce capital investments and promote the use of clean, renewable energy power plants.



ES-3.5 - Ener-t New Generation Solar Collector parabolic trough collector installed at India



Kramer junction – view of the power block from the SEGS project



## The company

Ener-t is a privately held Israeli Company based in Jerusalem. The founder and managing director is Mr. Yehuda Harats.

Mr. Harats was previously the Executive VP of R&D, Engineering, Manufacturing and Operations at Luz Ltd. – the pioneer of thermal solar power technology and developer of the famous 354MW SEGS projects. He is also the developer of the original evacuated receiver (HCE), the core component of the parabolic trough system. At the core of the Ener-t's group are highly experienced scientists and engineers who are also veterans of Luz. Their experience covered all aspects of the thermal solar technology – including the complete solar field with all of its key components, technology and the integration of the solar field with the power block to create highly reliable and efficient solar power stations.

Our experience in thermal solar goes back more than 25 years but we still continue to innovate in all aspects of the technology. Ener-t further developed its technology to the level that it can supply base load power 24 hours a day all year around. Our design strategy is focused on creating projects that will match the design point in a reliable way year after year. Our unique technologies also include an advanced approach for hybridizing the thermal solar energy together with all kinds of biomass and fossil fuels.

The company is focused on the execution of EPC type projects in all of their phases: Design, Engineering, Procurement, Construction, Commissioning and Operation and Maintenance.

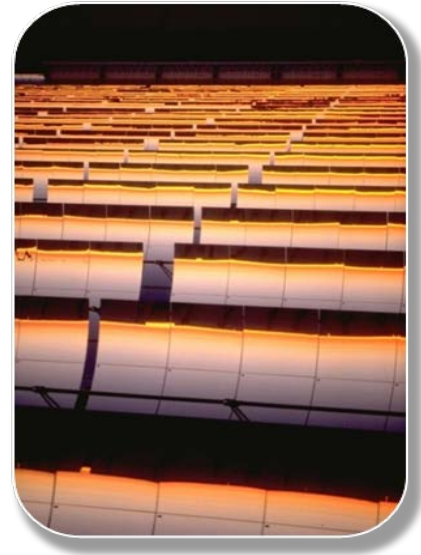
Ener-t is uniquely positioned to successfully provide EPC, our team have lead the development of the original commercial parabolic trough technology, as well as having participated in all aspects of the engineering of the successful SEGS plants in California and current projects in Spain and India. Specifically with regard to the solar field – the heart of the plant – Ener-t brings the technological capability to select and construct the best components and to control the costs of this significant and vital sub-system.

Our capabilities and company structure allow us to provide a low Capex & Opex Plants' configuration (with high local supply content) combined with a high expected performance. We bring these strengths to achieve the best possible plant configuration, optimized to its location and unique project characteristics at the lowest project investment.

Ener-t is quality certified per ISO-9001:2008 and 14001:2004 standards requirements.

To learn more about Ener-t's solar solutions contact us at:

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Ener-t's CEO Yehuda Harats

Previously – Executive V.P. Technology & Operation of the Luz company,

Pictured at the SEGS-I site California, 1985

