



HELIOVIS

Innovative Inflatable Solar Concentrator



Co-funded by the Horizon 2020
program of the European Union

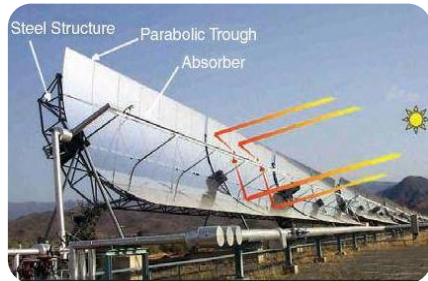
July 24st, 2017

INTRODUCTION AND GENERAL CSP INFORMATION

Overview of current Solar Thermal Collector systems



Parabolic Trough



Solar Tower



Fresnel Reflector

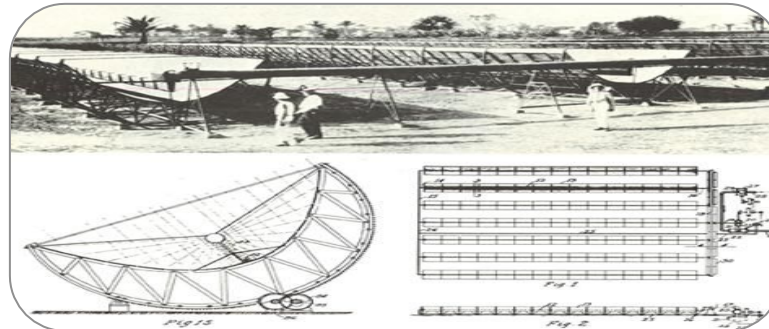


Solar Dish



Substantial material consumption, complexity and high costs

From vision to a world changing mission?

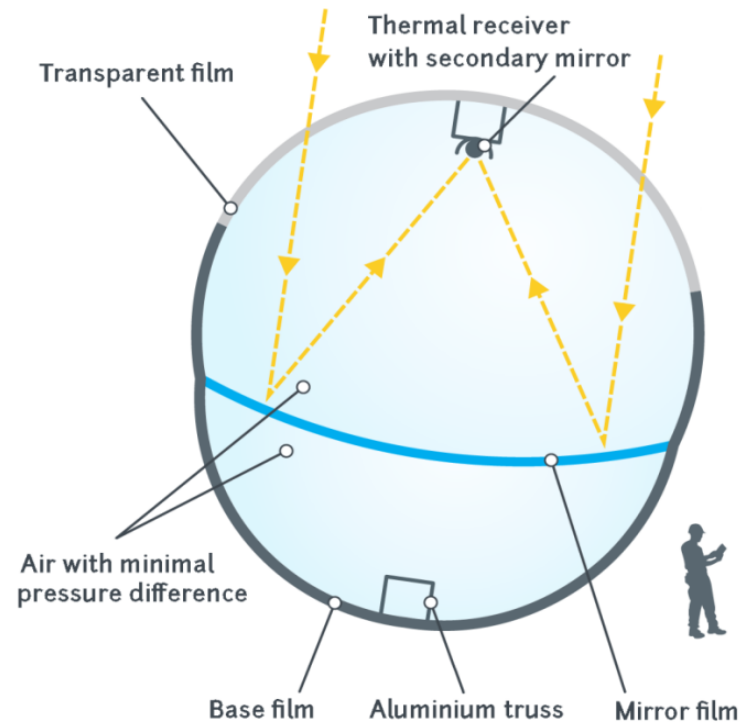


Low level of innovation and hardly any advances in technology

HELIOTUBE TECHNOLOGY

The HELIOtube

HELIOtubes enclose the mirror surface and thermal receiver to prevent operational inefficiencies



WHAT IS THE HELIOTUBE:

The HELIOtube is an **innovative inflatable solar collector** with a length of 220m and a diameter of 9m. The tube is separated into **two airtight chambers** by a mirror film running lengthwise through the tube. A small difference in pressure, between the top and the bottom chamber, arches the mirror film downward and **concentrates sunlight on a thermal receiver**. Connected to each other, the HELIOtubes form a solar-thermal power station, as well as innovative hybrid solar thermal solutions. The produced energy is used in **various industrial processes** or converted to electricity.

COMPETITIVE ADVANTAGES:

The HELIOtube is produced with commercially available and recyclable plastic films and enables **cost savings of up to 55%** over the entire lifecycle compared to other parabolic trough technologies. The cost reduction not only due to the material used but also by **optimizing all involved processes** ranging from production and logistics up to installation and operation.

HELIOtube technology development

From prototype to a commercially ready technology



Prototype in Spain (2013)



Pilot system in Austria (2014)



Demo plant in Austria (2016)



Industrial application in Spain (2016)



HELIOtube – an innovative inflatable solar concentrator

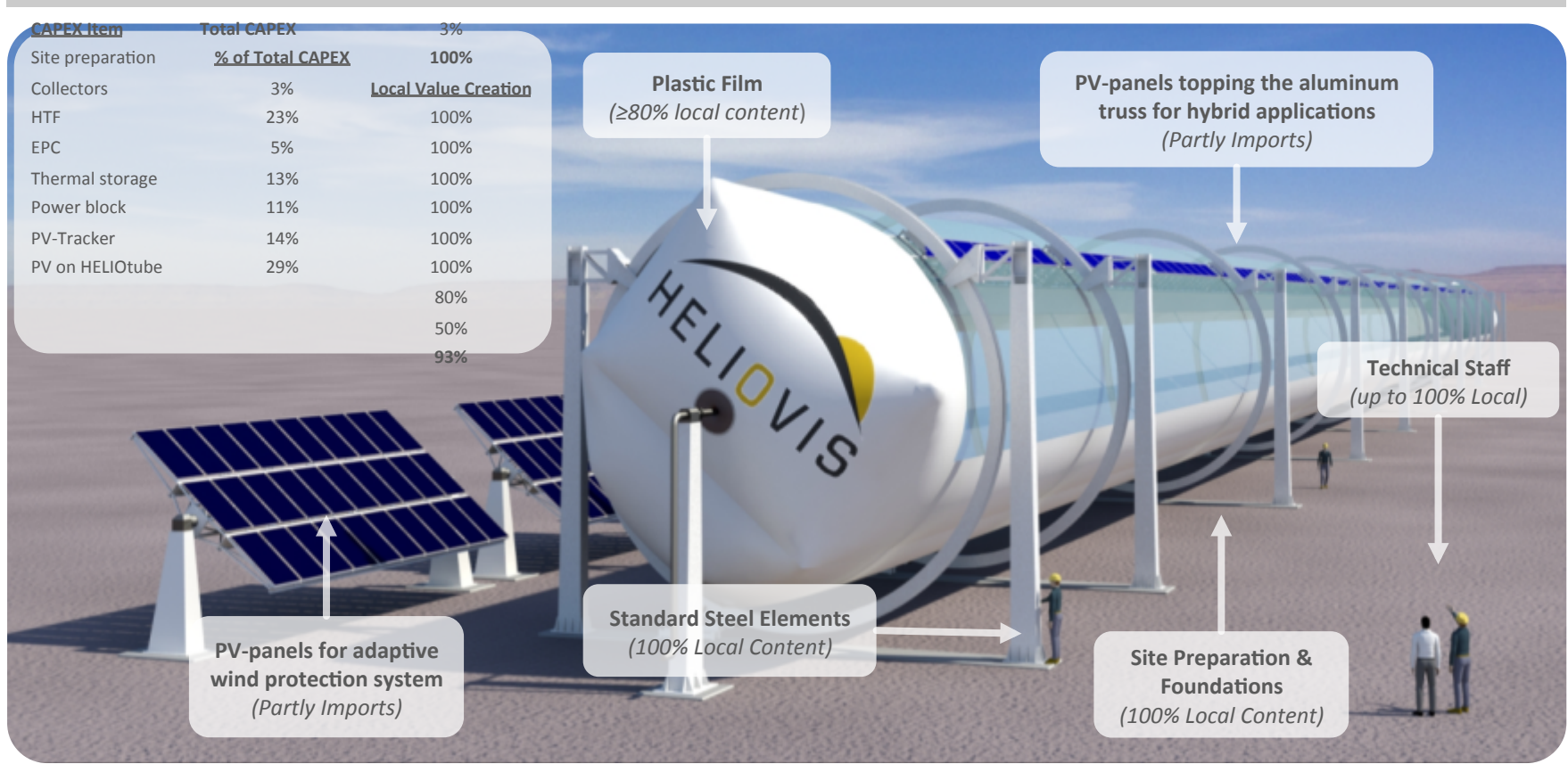


DNI: 2,036 kWh/m²
Output: 1 MWth

Length: 220m
Width: 8.7m

The HELIOtube design is innovative in all details

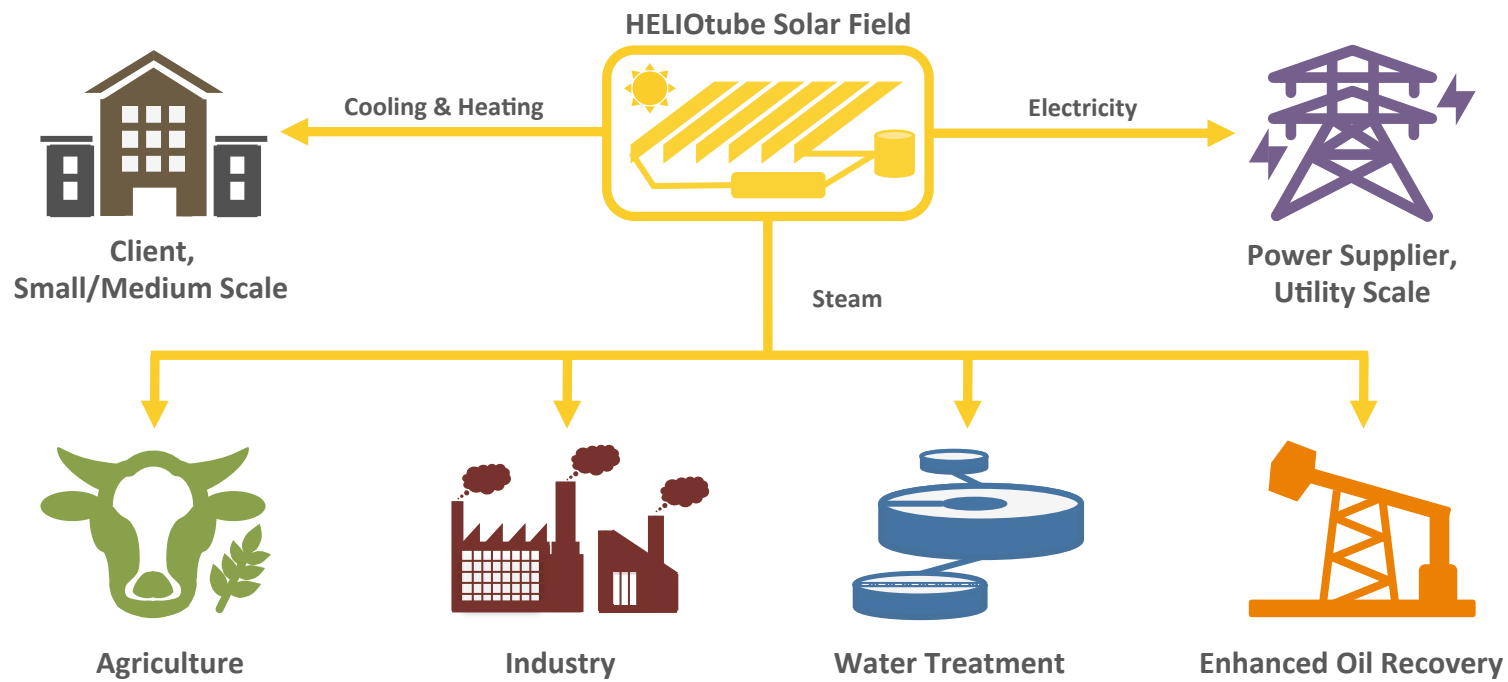
Made totally of polymers and metals, almost all raw materials and components can be fabricated locally



APPLICATION OF THE HELIOTUBE TECHNOLOGY

Multi-purpose Solution

Flexible solar solutions customized to the needs of each client



VIDEO

First Industrial Application

EU Horizon 2020 Project



- **Co-financed by the European Union** research and innovation programme “Horizon 2020”
- Installation **completed in only 8 weeks** with 5 to 12 engineers simultaneously onsite; draw-in within 8 hours over night
- **Off-taker** is Mercajucar in Villalgordo de Jucar (Spain) that grows, processes, transforms, packages and commercializes agricultural products
- **Output of the HELIOtube plant** totaling 1 MW_{th,p} in form of steam used for soil steam sterilization as well as the regulation of temperature and humidity. Temperature required is 200° C. Storage in 30,000 liter water tank.
- The plant **reduces the consumption of Diesel** by 120,000 liters annually
- Several **benefits** achieved by using the HELIOtube technology
 - Enhanced product quality
 - Sustainable and stable production throughout the year and extension of product offers beyond seasons
 - Cost savings and cutting CO₂ emissions



HELIOtube technology in Southern Spain

EU Horizon 2020 Project



Before draw-in



- ✓ Site prepared
- ✓ Steel frames installed
- ✓ Aluminum truss girder applied
- ✓ Thermal receivers applied and system tested

After draw-in



- ✓ Successful draw-in over night
- ✓ Monitoring system tested and approved
- ✓ Heat transfer fluid incorporated and tested
- ✓ Commissioned end of Q2 2017

Innovation needs support!



Horizon 2020 for SMEs

- Large Corporates act as aggregators and simply buy innovations.
 - They are risk-averse investors and invest in business-ready late stage start-ups.
 - Small clean-tech companies rarely make their ideas reality.
 - They depend on programs like Horizon 2020
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- Increased team motivation
 - Great public exposure
 - Increased investor interest
 - Strategic partners showed big interest
 - Acts as sign of credibility and trust

Thank you for your attention!



Farhad Shikhaliyev

Mobile: +43 (0) 676 898 474 424

E-Mail: farhad.shikhaliyev@heliovis.com