In collaboration with Massachusetts Institute of Technology

WORLD FUTURE ENERGY SUMMIT
PART OF ABU DHABI SUSTAINABILITY WEEK

Cleanergy.Net EU-GCC

Masdar INSTITUTE




Masdar Solar Hub's R&D activity in the CSP field

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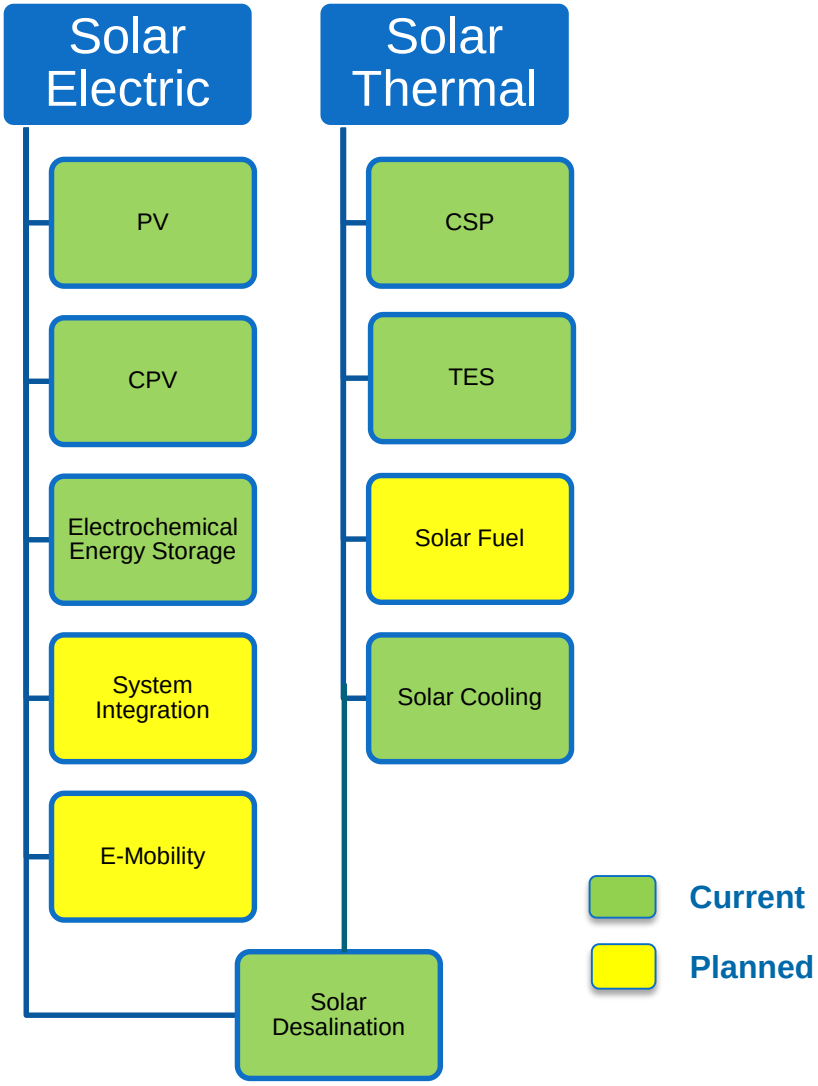
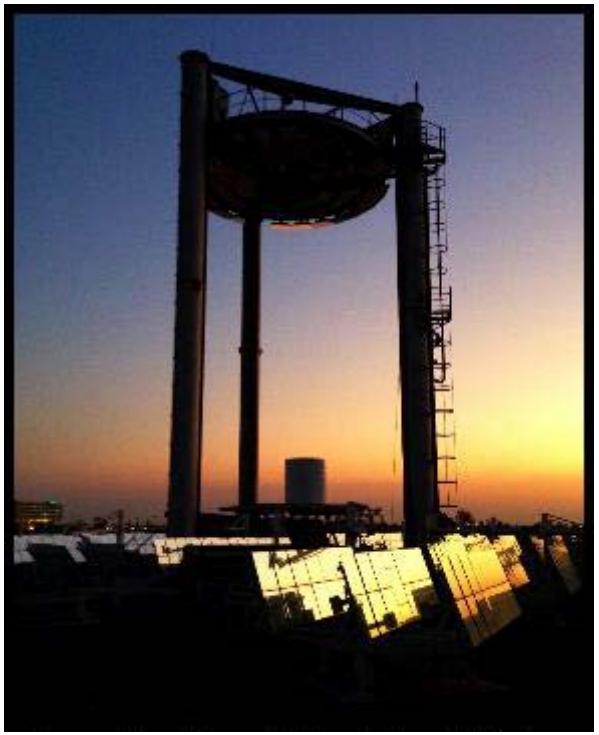
Masdar Solar Hub's Capability Areas

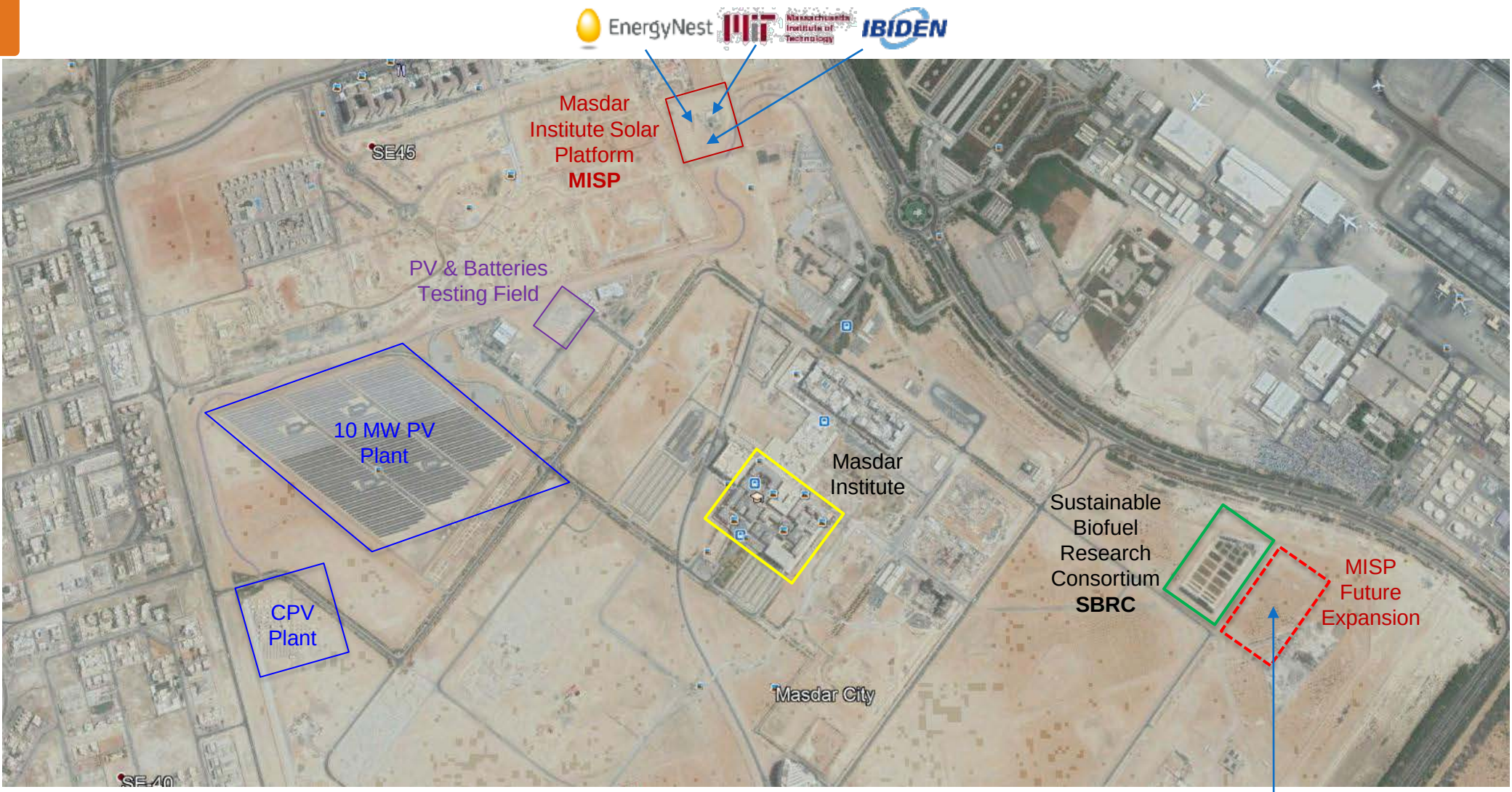




The Masdar Solar Hub was created in 2015

Dr. Nicolas CALVET

Masdar Solar Hub's Facility Locations



The Masdar Institute Solar Platform (MISP)

First Solar Platform in the UAE fully dedicated to R&D on CSP and TES

Picture credits: Victor G. Perez

Facing Desert Challenges in the UAE

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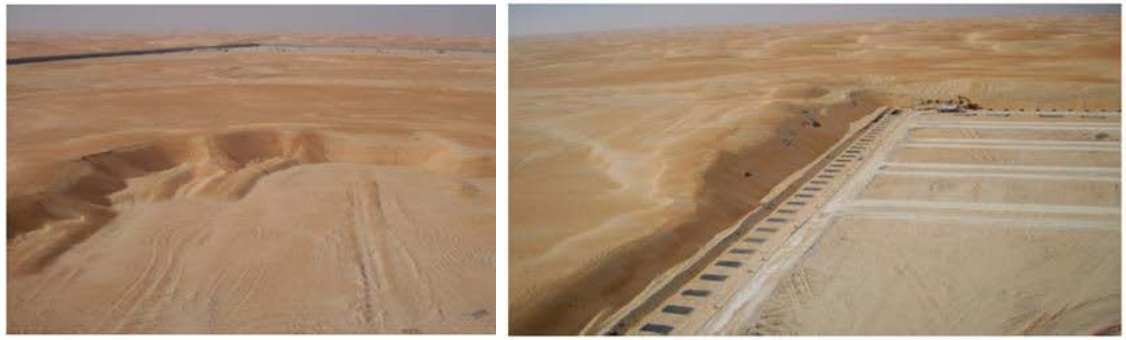
Objectives:

- ✓ Test and validate new technologies at the pre-commercial scale with interest for Masdar's future tenders
- ✓ in UAE harsh environment (dust, sand storm, humidity, corrosion, temperature, etc.) and adapt it if necessary
- ✓ Attract International Collaborations/Investors
- ✓ Decrease the cost & Increase efficiency of CSP systems



5 Mm^3 of sand displaced

Shams 7 m high Wind Break Barriers

Collaboration with Industry

EnergyNest (Norway)

EnergyNest

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EnergyNest's Concrete Storage Pilot
2 x 500 kWh

Objectives:

- Test solid state storage for parabolic trough or waste heat recovery, etc.
- > 280 cycles completed

Partners:

SIEMENS

DOW

HEIDELBERGCEMENT

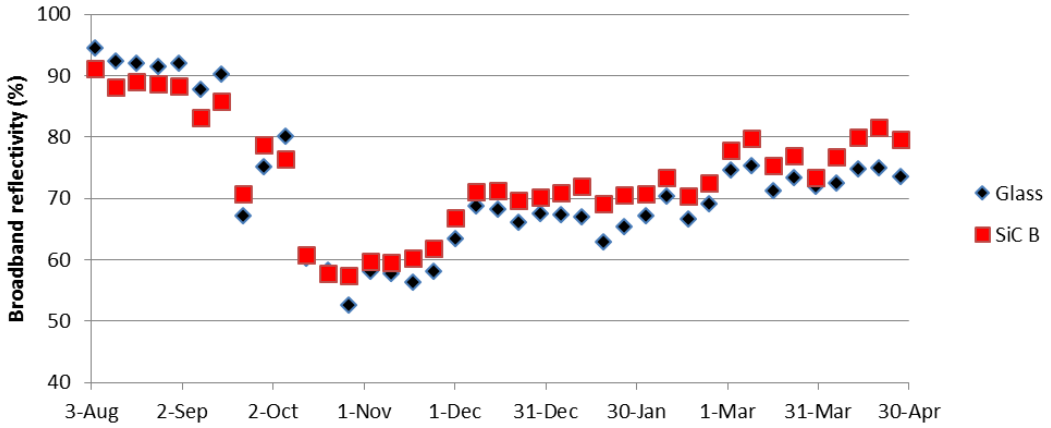
Supported by

Innovation Norway

The Research Council of Norway

IBIDEN (Japan)

Ibiden SiC Mirrors



IBIDEN SiCMirrors

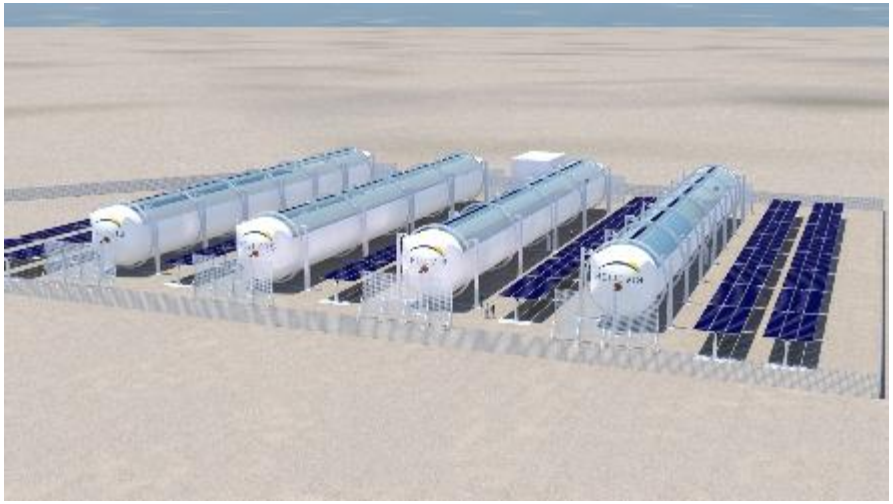
Japanese Delegation visiting the MISP in November 2014

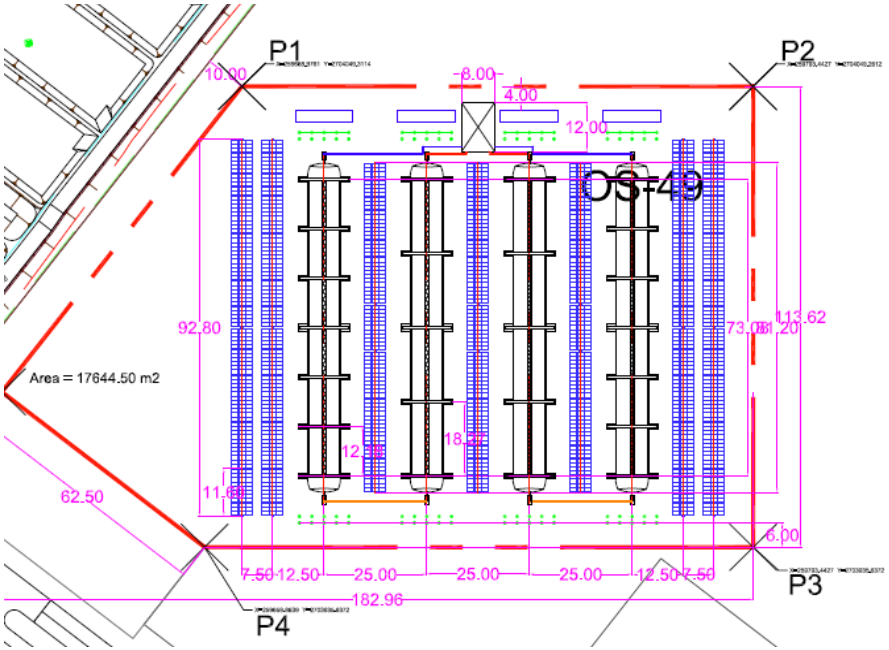
Objective:

- ✓ Test new SiC Mirrors & Cleaning Methods in Humid Desert Conditions

Heliovis (Austria)

Combined CSP/PV (1.3 MW_{th} + 472 kW_e)





Objectives:

- Test inflatable parabolic trough collectors in harsh environment
- Test PV trackers as wind deflectors
- Test operation maintenance and cleaning methods

Timeline: March 2018

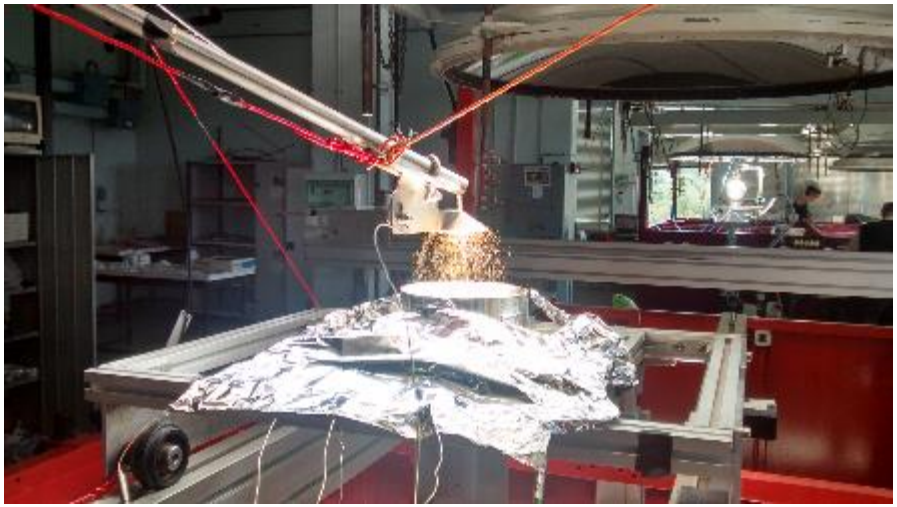
Duration: 2 years

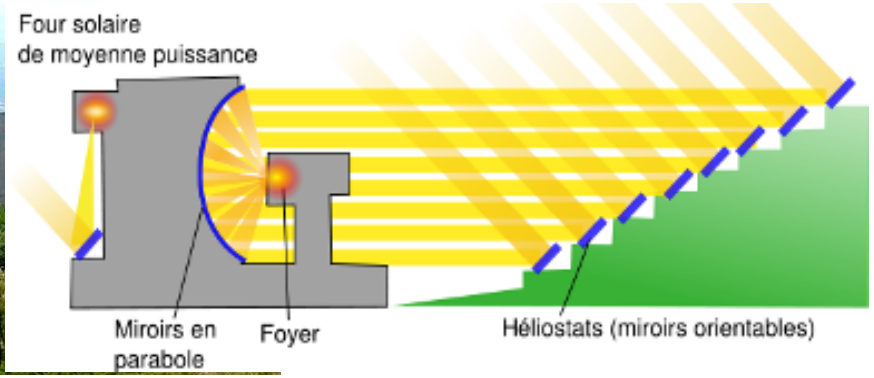
Collaboration with Academia/Research Institute

PROMES CNRS (France)

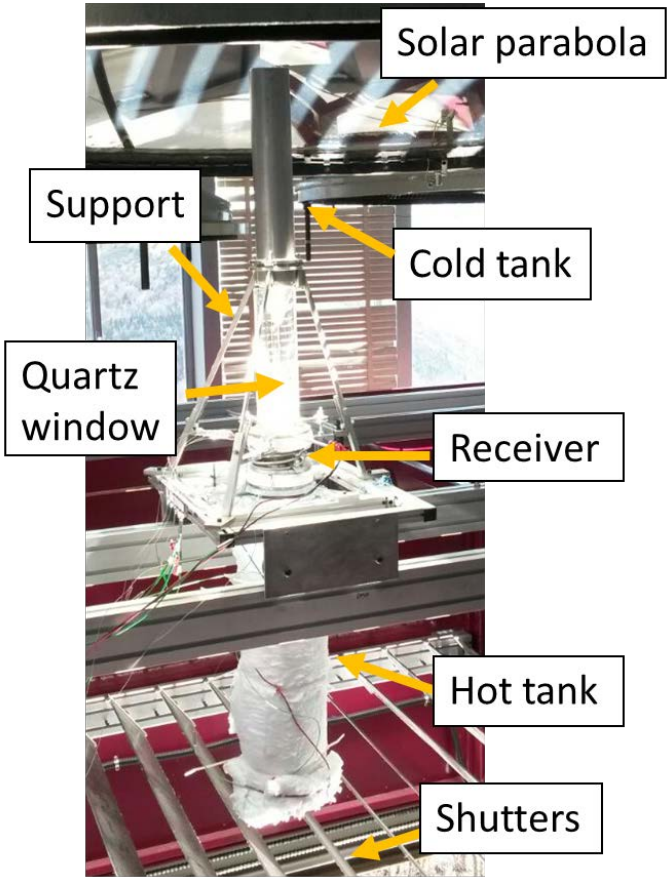
SandStock Project (Particle Receiver)

1st Prototype (Summer 2014)





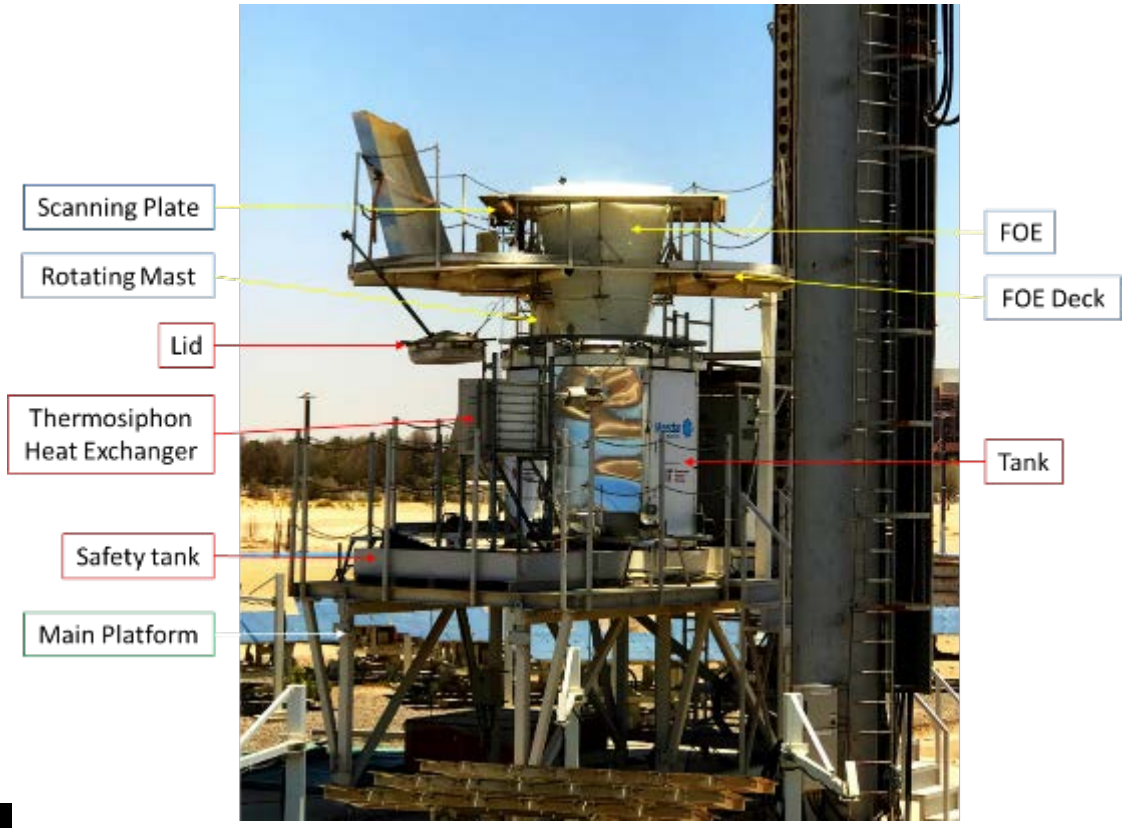
2nd Prototype (Summer 2015)



MIT (USA)

Concentrated Solar Power on Demand Demonstration (CSPonD Demo)

CSPonD Demo during operation in June 2017



Partners:

SQM The Worldwide Business Formula

National Instruments

Parker

Project Cost: 3 M$ (Internal Grant)

CSPonD Demo Pilot

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1st Melting

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CIEMAT (Spain)
DLR (Germany)

Mirrors Degradation

Corroded facet selected for analysis
Installed in 2009

Comparison of samples under accelerated aging and ‘’naturally’’-aged ones:
Allows evaluation of accelerated-aging protocols

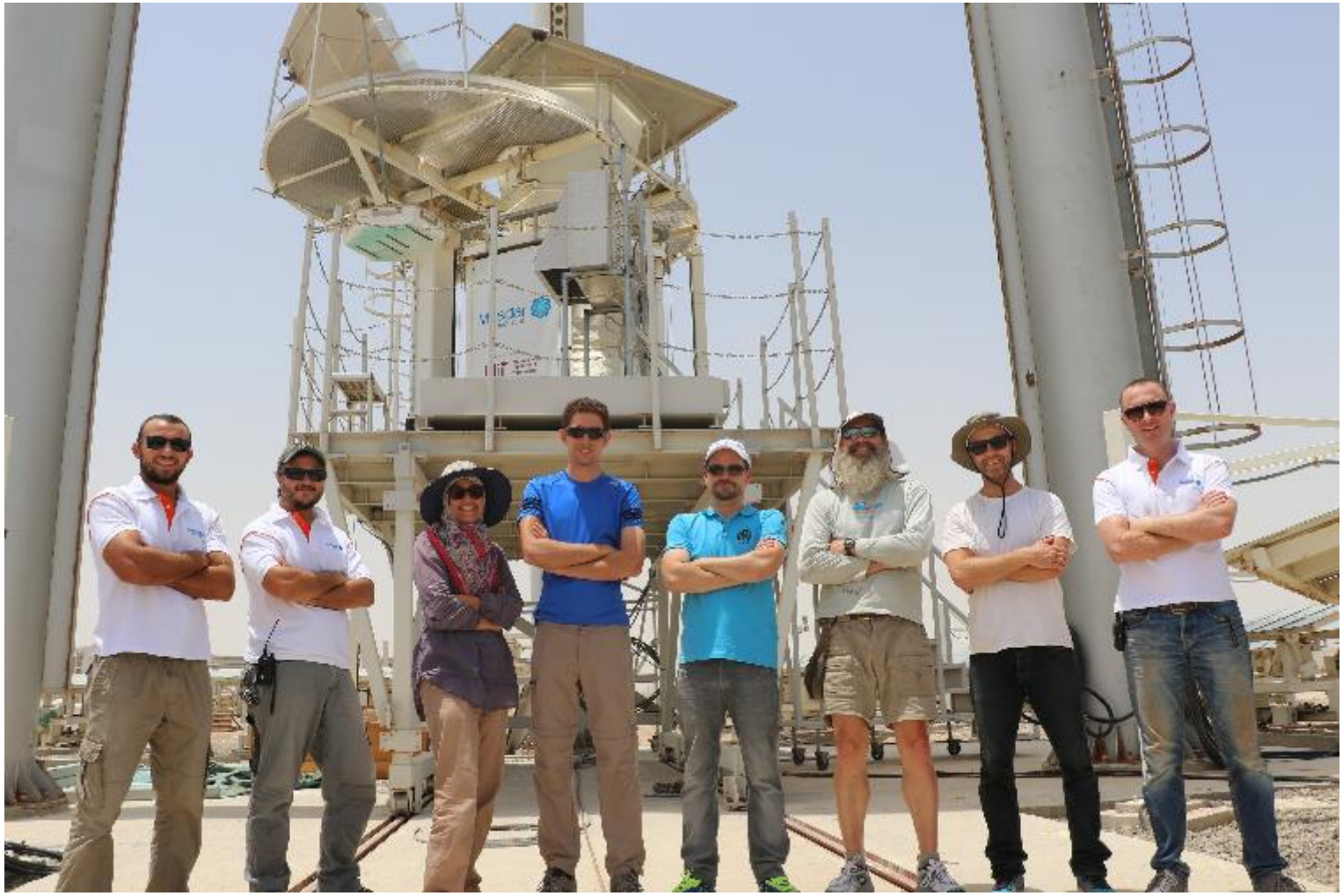
=> 2 Conference Papers + 1 Journal Paper

EU GCC CSP Alliance

CENER and more…

1. Characterisation of weather conditions in the GCC region
2. Indoor testing
3. Outdoor testing
4. Improving O&M aspects
5. Accelerated aging test guidelines
6. Improving durability of the mirror
7. Measuring attenuation

Thanks to all the Team



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Special thanks to Cleanergy.Net EU-GCC

Thank You

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