Research on Concentrating Solar Technologies – DLR Infrastructure

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DLR Institute of Solar Research

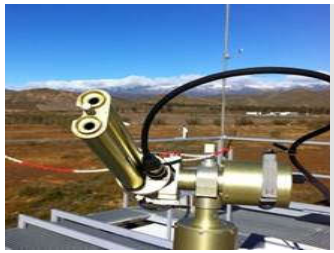
Institute of Solar Research
Research & Development

Point Focus Systems
- Heliostats
- High temperature receivers
- System technology

Line Focus Systems
- Heat transfer media
- Collector development
- Industrial process heat

New Materials
- Absorber materials
- Hight temperature redox systems
- Photocatalysts
- Heat transfer fluids

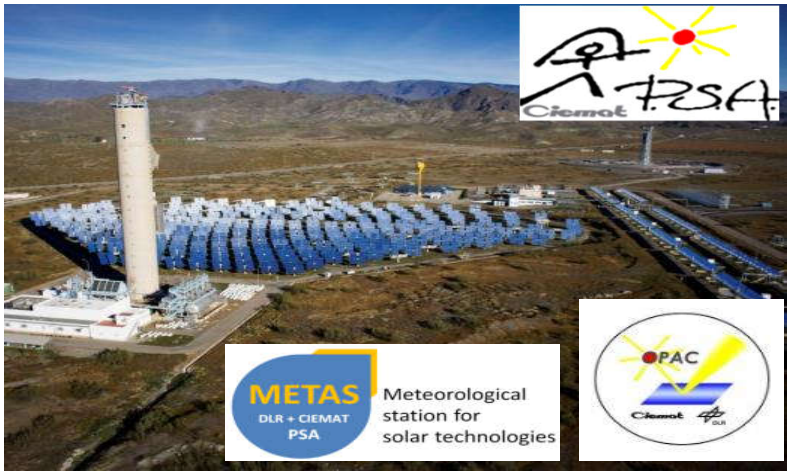
Qualification
- Components
- Component durability
- Systems

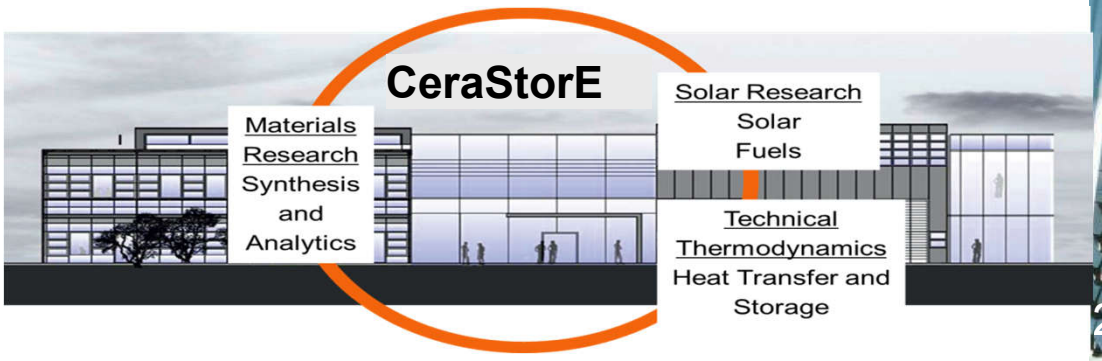


Solar Energy Meteorology
- Solar radiation measurement and modelling
- Radiation nowcasting
- Other meteorological influences

Solar chemical engineering
- Solar fuels
- Solar water treatment

Large scale facilities



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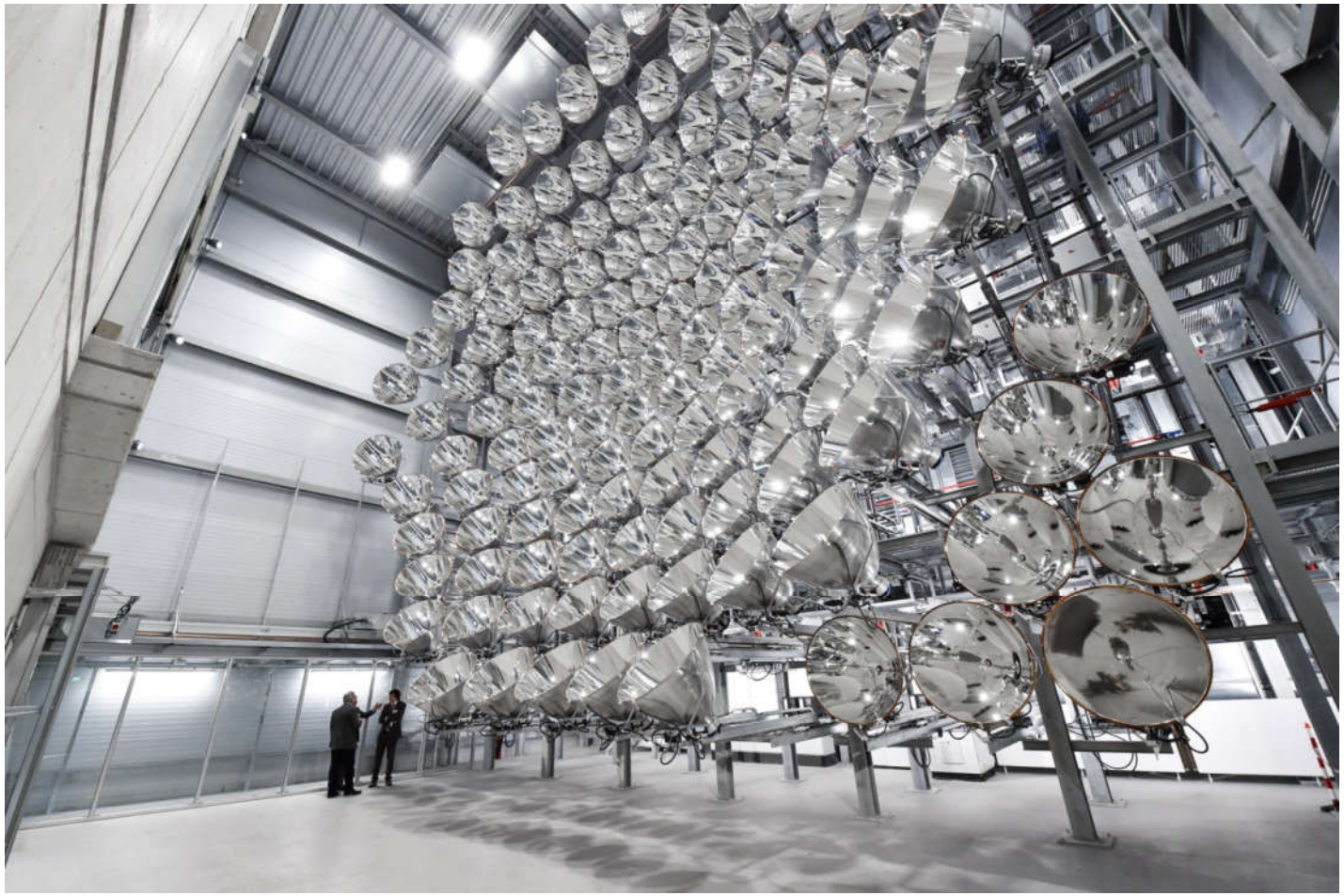
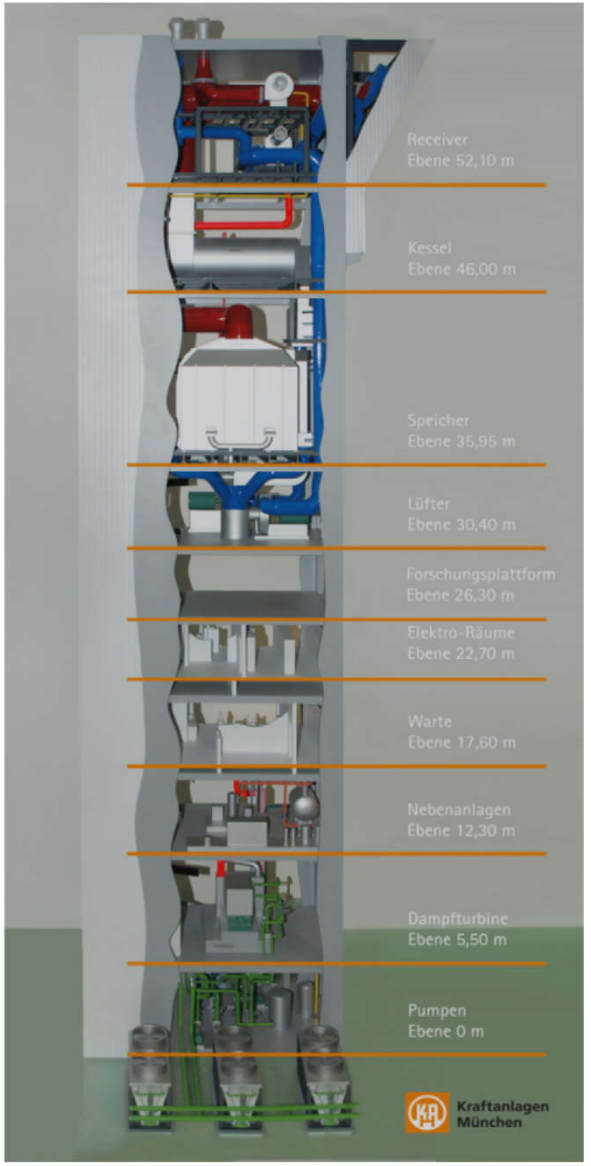
Large-Scale High-Flux Solar Simulator (HFSS)

- 149 identical modules
- Approx. 2.6 kW_{rad} per module
- 3-axis-moveable
- Static and dynamic radiation profiles
- Three spacious test chambers for parallel working
- Modern IT-equipment and CCTV



Solar Tower Jülich STJ

- Integrated power-plant
- Open volumetric receiver
- Thermal storage
- Power 1.5 Mw_{el}
- Field up to 7.5 MW_{th}
- Hight 60m
- Research platform for up to 500 kW experiments

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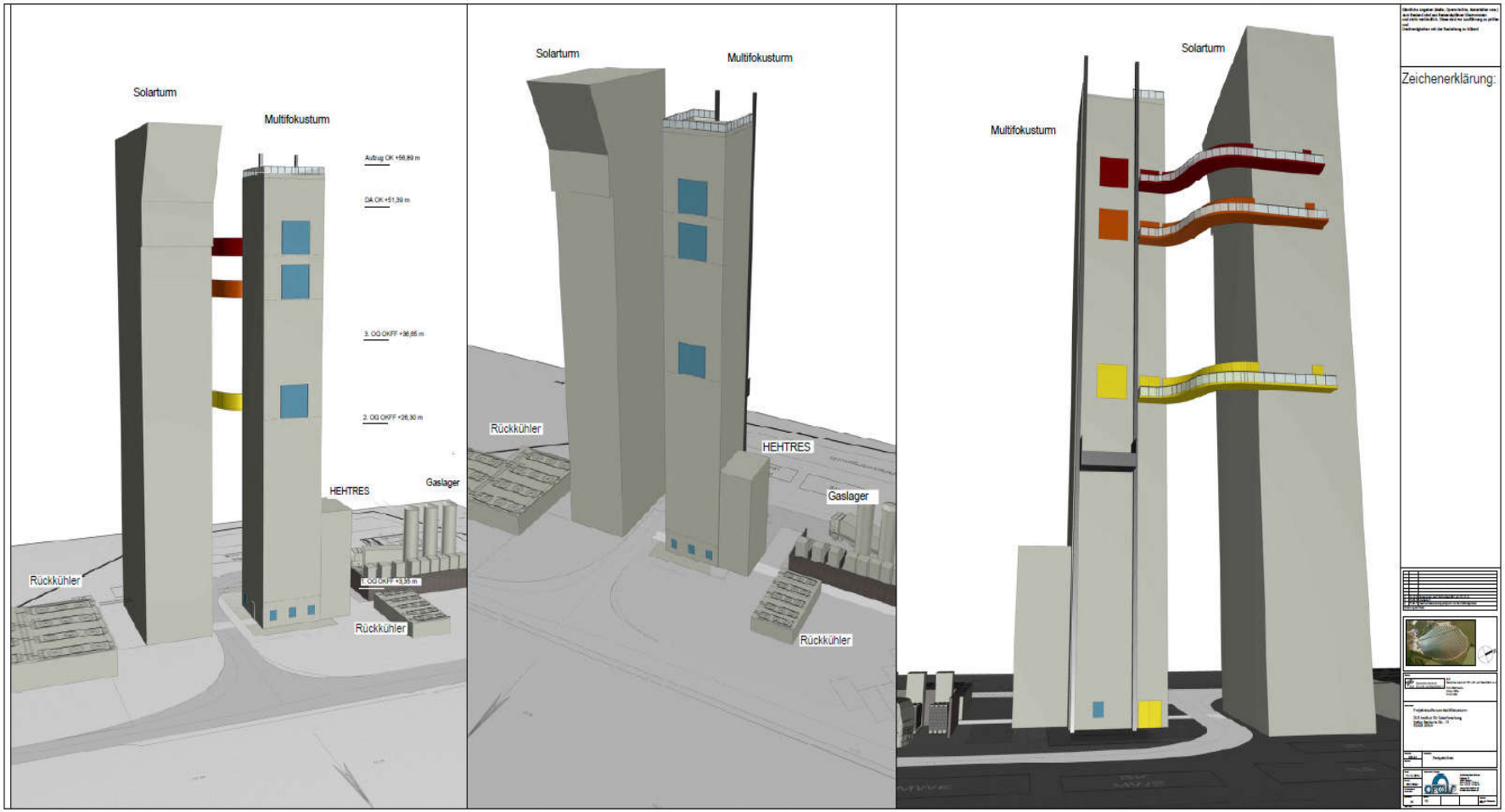
Multi-focus-Tower (MFT)

- Multi-focus-Tower next to STJ, uses same field and has three levels
- Construction just started, inauguration in 2020



Universidade de Evora and DLR joint venture

Evora Molten Salt Platform (EMSP) in Portugal

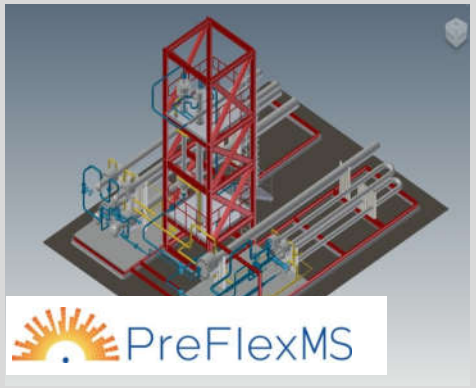
Flexible research platform for molten salt systems

Developed by DLR und University of Evora in HPS2 project

Owned by University of Evora, jointly operated with DLR

DLR · UNIVERSIDADE DE ÉVORA · TSK FLAGSOL · YARA · steinmüller engineering · eltherm innovations in heat tracing · innogy · Eskom · RIOGLASS

Predictable and flexible power production



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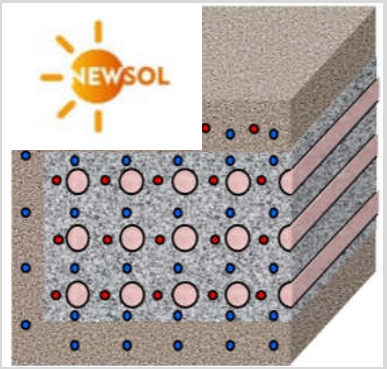
Indirect thermal storage



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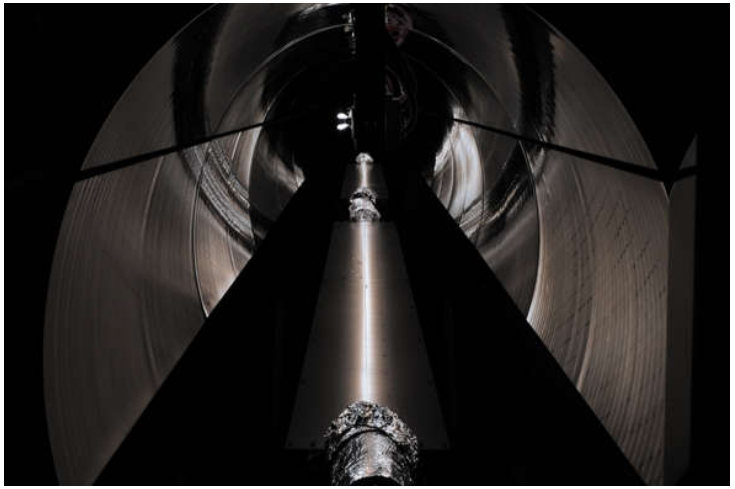
QUARZ® – Center
Test and Qualification Center for CSP Technologies

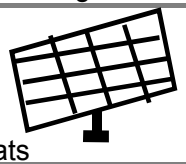
- Strong impact on the **performance and cost efficiency**:
  - CSP component quality and durability
  - their interaction in the overall system
  - and the meteorological conditions each

- Development of **measurement techniques and devices**
- Evolution of **guidelines and standards**
  - testing methods
  - quality criteria

- Customer oriented services
  - → Fundamental information for industry to
    - **Improve** quality, performance → **competiveness**
    - **Proof** of product quality → successful **market entry / bankability**
  - → Consulting and training



Qualification in Different Phases

Phases Objects		R&D Phase Prototypes	Production Phase Mass Product	O&M Phase Commissioned Plant
Concentrator	 Parabolic Trough Coll.	✓	✓	✓
	 Heliostats	✓	✓	✓
Receiver	 Parabolic Trough Receiver	✓	Several manufacturing specific quality control measures	✓
	 Central Receiver	✓	Several manufacturing specific quality control measures	✓
Materials		✓	Several manufacturing specific quality control measures	✓

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