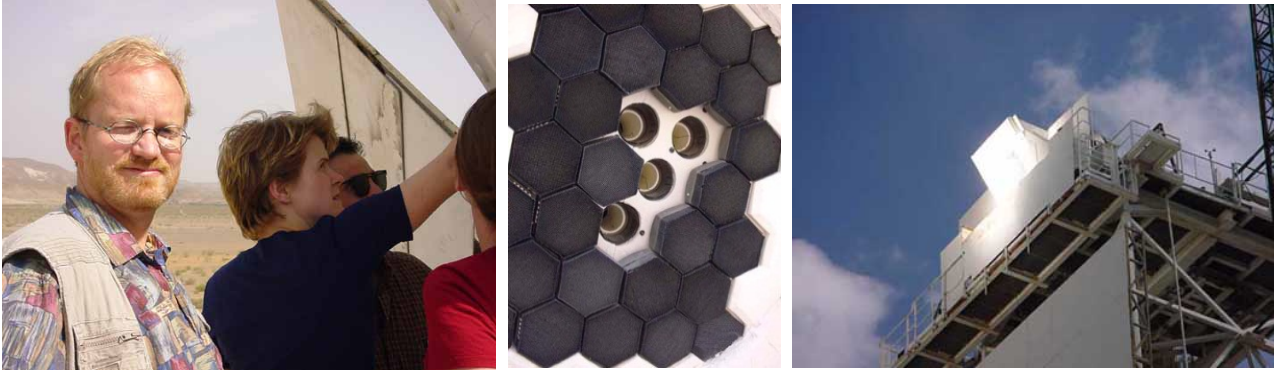


HitRec project



The German company Steinmüller GmbH (taken over by Babcock late 90ties) has developed the Volumetric-Receiver, double membrane that was tested 1999. This concept is based on Inconel 600 wire-mesh modules knitted to a stocking and rolled up flatly to a 40 mm high flexible disc with a hexagonal shape with app diameter of 250 mm. 22 discs are pressed separately into to a hexagon and gathered into one receiver surface of app 3 meter diameter. The re-circulation of the air medium is limited to 60% by this VR design. Maximum operating temperature for this 3 MW electricity receiver is 650°C which does not, however, prevent melt-down.

Tasks and goal of HitRec I and II research projects was the development of more stable absorber materials for the Volumetric Receiver principle better suited to handle the abuse loading of 1 MW/m² from the heliostat field.

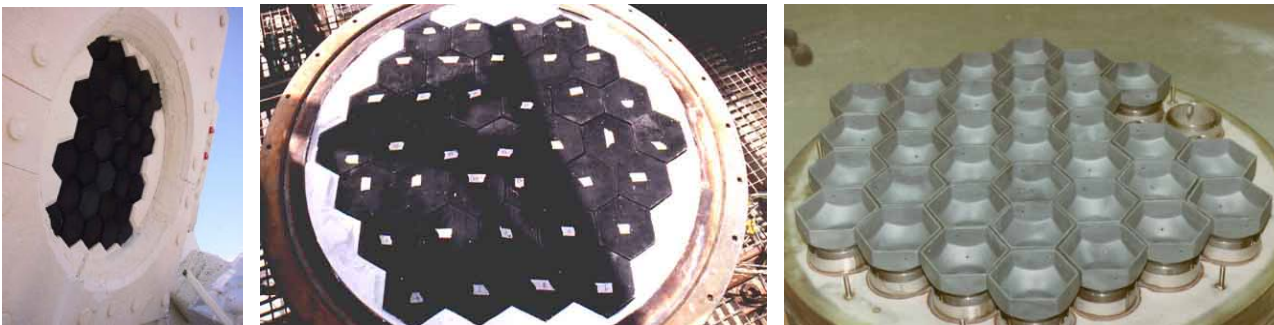
HitRec 1 was based on a double membrane circular setup manufactured from expensive Inconel materials and based on the much more advanced ceramics ReSiC material VR-units.

HitRec2 was based on a rectangular setup with less advanced materials, high temperature stable steels and design to eliminate problems associated with overheating of the double membrane. The HitRec mounted with the ReSiC VR-units were operated for 25 hours at 780°C maximum air outlet average temperature. The load was typically supplied from 20 mirrors from the heliostat field with irradiation in the range of 750-880 W/m². Air flow through the total number of units was on an average 0,22 kg/s. Total operating hours about 250.

Partner:

- Stobbe Tech, Denmark supplied the ceramic VR-units – www.stobbe.com
- DRL, Germany - www.dlr.de
- Centro de Investigaciones Energéticas Medioambientales y Tecnológicas (Ciemat) - including availability of solar test beds on the Plataforma Solar de Almeria in South-Spain - www.ciemat.es

Title: “Initial development of the hexagonal shaped Volumetric Receiver for Solar Thermal Power Plants”



The project was sponsored by the EU commission under FP5
Project period: 1996-98