

# 20 kW Solar Thermal Power Plant

## Salient Features:

Capacity : 20 kW

Concentrator : flat helio-dish, 9m dia

Reflector : 50 m<sup>2</sup> area

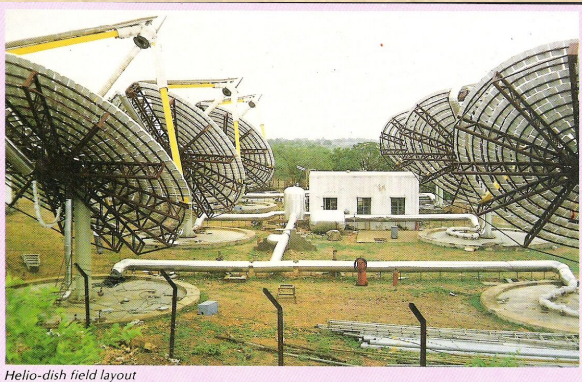
Mirror facets : trapezoidal 225 nos

Cavity receiver : 565mm dia, 680 mm length coil with 10 mm tube

Concentration : 1500 suns

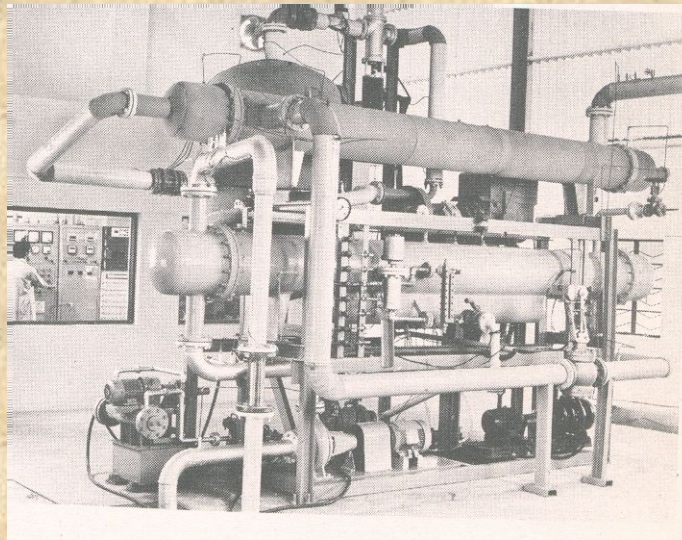
Steam output : 180 Kg/hr, at 500 °C, 70 ata

Engine : 300 cc Reciprocating



Helio-dish field layout

# ORC Power Plant

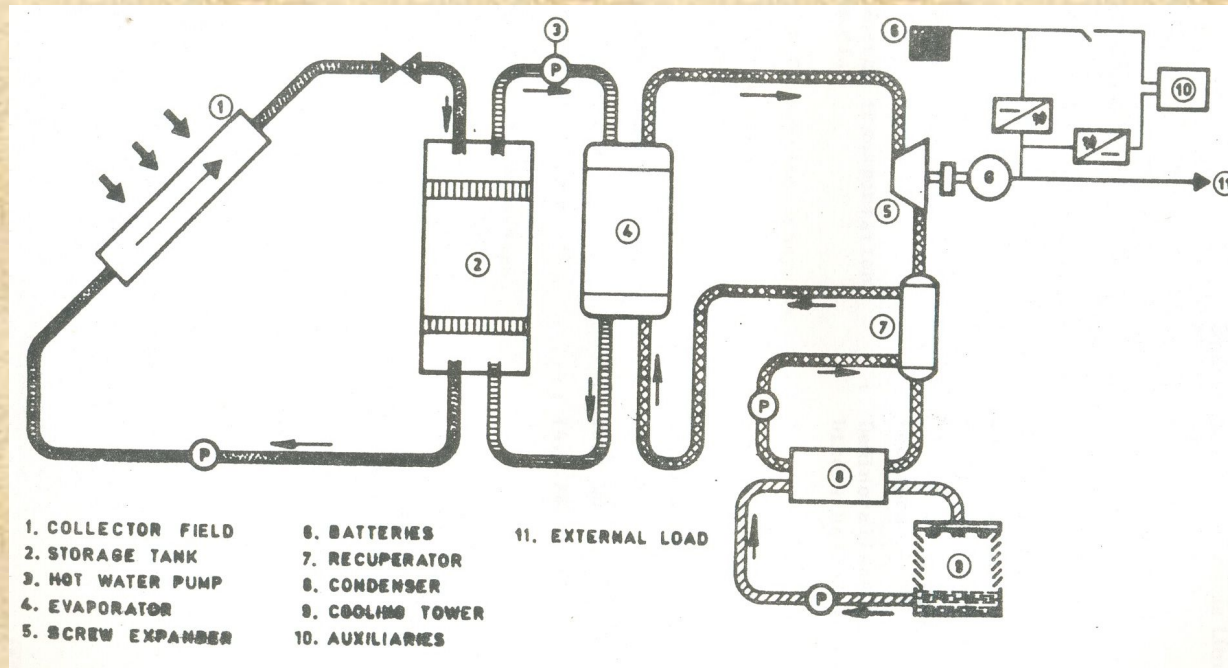


Capacity : 20 kW

Working Fluid : Freon -11

*BHEL's Experience*

# 10 kW SOLAR POWER PLANT INSTALLED AT IIT MADRAS



## System Specifications:

Type of Collector : Double Glazed flat plate

Working Fluid : Freon 114

Thermal energy input : 214 kW

Overall efficiency of the power plant : 0.7%

Collector Area : 756 m<sup>2</sup>

Prime mover : Helical Screw Expander

Generator output : 14.5 kW

*BHEL's Experience*

# McDonnell Douglas/Southern of California



California Edison 25 kW dish/Stirling system. The 944 square foot concentrator consists of 82 spherically curved glass mirrors each 3 foot by 4 foot. The United Stirling 4-95 Mark II engine (4 cylinders of 95 cc displacement) uses hydrogen as the working pressure at a maximum gas pressure of 2900psi.. This engine delivered 25kW output at 1000W/m<sup>2</sup> insolation.

*Solar Stirling engine system development*

# Stirling Thermal Motors



25 kW power conversion system under test at Sandia National Laboratories. Using STM4-120 engine incorporating variable displacement power control

# Advnco/Vanguard 25 kW dish /Stirling system installed at Rancho Mirage, California



The Vanguard concentrator is approximately 11 meters in diameter and made of 366 mirror facets, each facet measures 18 by 24 inches. The engine used is a United Stirling AB (USAB) Model 4-95 Mark II driving a commercial 480 volt/ac 60-Hz alternator.

*Solar Sterling engine system development*