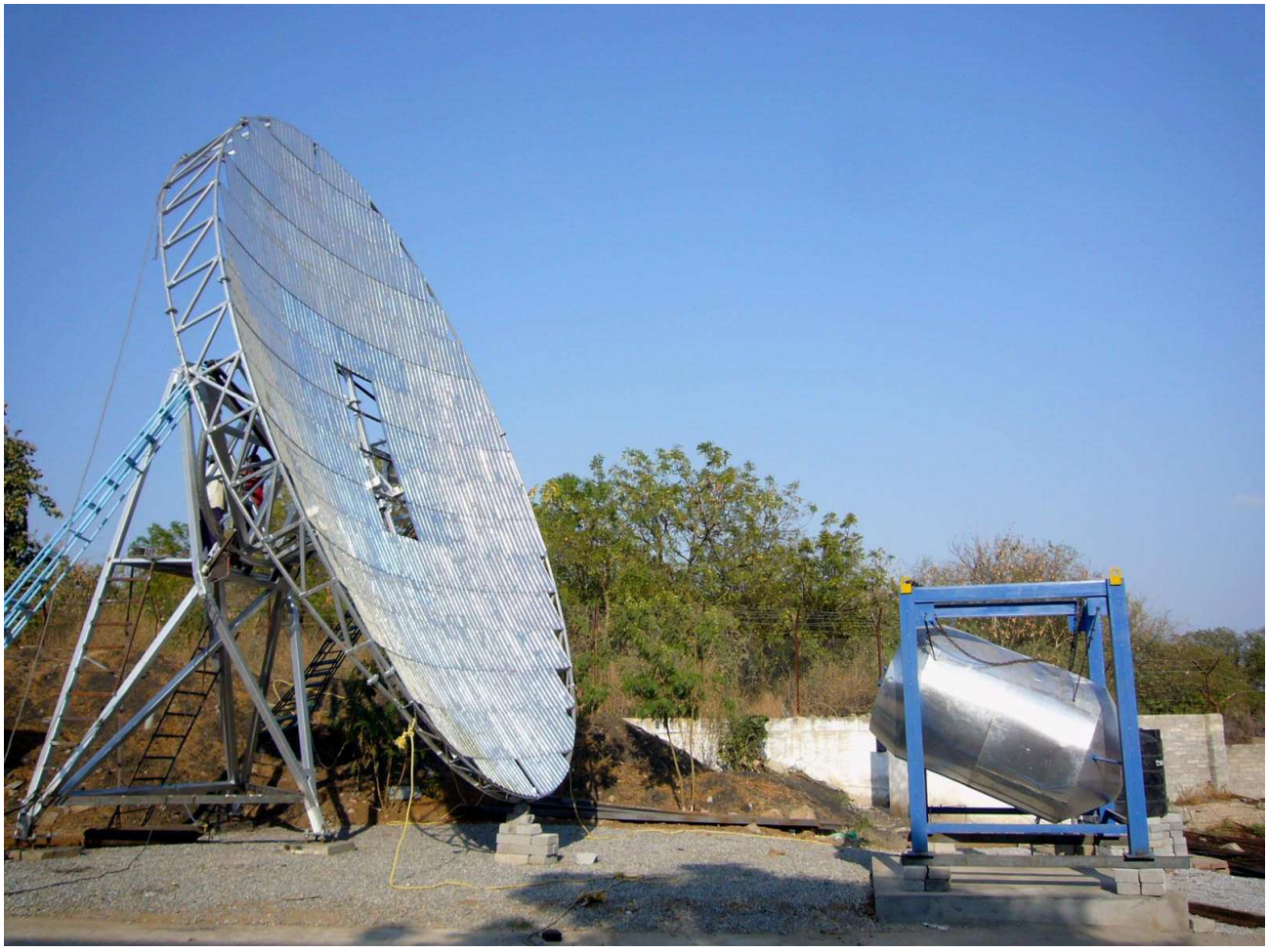
Executive Summary

“INDIA ONE”

1,0 MW el. SOLAR THERMAL POWER PLANT
in cogeneration with innovative thermal storage
for continuous operation
by the
World Renewal Spiritual Trust

near
SHANTIVAN CAMPUS, ABU ROAD,
RAJASTHAN, INDIA



New 50m2 prototype parabolic dish with cavity receiver & storage

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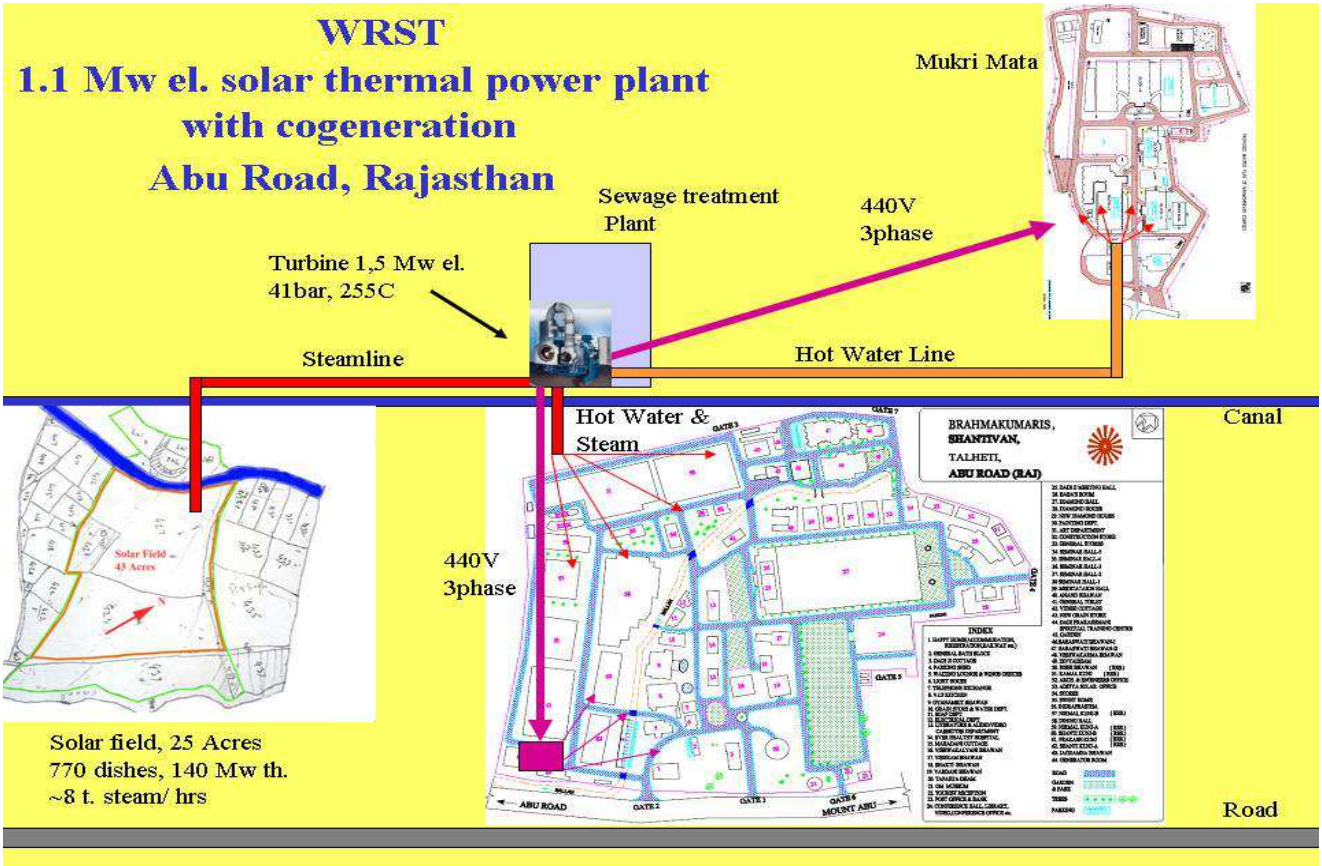
Solar steam cooking system at Shantivan Campus, Abu Road

1. Introduction/ Executive Summary

Energy is one of the most important requirements for this world to function properly. Its availability and regular supply are of paramount interest.
As we are all aware, energy and fuel prices are rising day by day and the negative effects of global warming are more and more visible.
World Renewal Spiritual Trust (WRST), a registered Charitable Trust/ recognized Solar Research Centre and sister organization of the Brahma Kumaris, is setting up **"India One"** a 1.0 Mw el. solar thermal power plant in order to demonstrate and multiply this innovative technology for India.
WRST makes use of the in-house developed new 60m2 Scheffler parabolic dish in order to set up the power plant near its Shantivan Campus in Abu Road, Rajasthan. For this project, WRST has teamed up with Fraunhofer Institute (ISE), enjoys the support of Wolfgang Scheffler and has secured part funding from the Indian and German Government. WRST is in close liaison with various solar R&D institutions and manufacturers and has started fabrication and erection by beginning of 2011.



Layout India One

The thermal solar power plant (solar only) will be the first of its kind in dish technology in direct steam generation mode, with full thermal storage for 16 hrs continuous operations for base load.

2. Project Description

After comparison of several solar technologies, the solar parabolic dish technology has been found most suitable for our purposes.

The 60m2 Dish is a proven technology, and WRST has 15 years extensive experience with this technology.

New designed 50m2 prototype dish and receiver, Shantivan Complex

The main advantages of the 60m2 parabolic dish with fix focus are:

- Cost effective / high output
- Modular design
- Innovative thermal storage concept
- Inexpensive planar mirrors and MC-controlled tracking system
- Fixed receiver with no need for flexible high pressure joints
- No vacuum technology and no metal glass sealing
- Direct steam generation, no heat exchanger and low parasitic loads
- Efficient use of land; the dishes can be tightly placed
- Power on demand and high efficiency due to cogeneration

First test of focus size and receiver

It is intended to set up the innovative solar thermal power plant based on the newly developed 60m2 parabolic dish with 16 hrs steel core cavity receiver and storage for continuous operation with the following main technical specifications.

Number of dishes	: 770 nos. of 60m2
Electrical output	: 1,0 Mw el. (net. 22000 kwh/24hrs)
Thermal output	: 140 Mwh th. (24hrs)
Solar field	: 25 Acres near to campus (1.3 km)
Total mirror area	: 45.000 m2
Turbine	: 1,0 Mw el. at 255C and 41 bar (Siemens)

Solar field with fabrication facility and part foundation/installation (Jan.2012)

3) Timetable

The time frame for completion of this project is 30 month.
The project will be executed in two phases:

Phase I: Simulation and planning and financial closure for the power plant
Phase II: Procurement and installation of the 1,0 Mw el. power plant

12.2010 - Financial closure
01.2011 - Start of the project
02.2011 - Purchasing of components
03.2011 - Fabrication and installation
06.2013 - Test and commissioning
07.2013-01.2014 - Evaluation, report preparation

60m2 dish in solar field

4) Budget

The budget for the project is 75 Crs Indian Rupees (~12 Mio. Euro) excluding cost of land.
The World Renewal Spiritual Trust has received partly funding from the Indian Ministry of New and Renewable Energy Sources (MNRE) and the German Ministry for Environment, Nature Conservation and Nuclear Safety (BMU).

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