

Format: MSP Completion Report

- 1) Date of Preparation of Completion Report: 31 May 2001
- 2) Title of GEF Medium Sized-Project: Concentrating Solar Power for Africa Study
- 3) GEF Allocation: US\$230,000.00
- 4) Grant Recipient: Eskom
- 5) World Bank Task Manager: Malcolm Cosgrove-Davies
- 6) Goals and Objectives of the MSP grant (including any changes in the objectives and components of the grant as compared to the original approved MSP):
The stated objectives of the CSP-Africa study were to:
 - Evaluate the leading solar thermal electric technology options with regards to their current and future potential for South Africa.
 - Conduct a broad site assessment to identify the most attractive areas for potential plants.
 - Identify preferred system(s) that could be economically feasible for Eskom to implement in the coming decade
 - Identify specific constraints that would need to be addressed to attain a sustainable deployment of solar thermal electric systems in South Africa

The project further aimed at closely monitoring the solar thermal electric projects being conducted in India, Egypt, Morocco and Brazil to facilitate learning from the experience obtained by the development of these projects.

- 7) Project Impact -- (a) whether and to what extent the objectives have been met; (b) whether the performance indicators have been achieved:
The four primary objectives, as identified above, have been met. The associated performance indicator was the completion and acceptance of the final study report by Eskom management as well as peer review. Peer review by CSP experts outside of the project team was conducted.
The final report will be circulated to Eskom management, following the consultant addressing issues highlighted in results feedback meetings held during March 2001 in South Africa.

Indicators linked to the specific tasks:

- (1) Evaluation of STE options according to certain criteria – Completed during technology screening phase. Two promising near-term options were identified.
- (2) Reference site identified to provide information for technology assessment – Upington in South Africa was identified and the required information obtained and formatted.
- (3) Conceptual designs for promising technologies – Designs, based on the current state-of-the-art components, were created to ensure that the plants are able to meet the region's dispatch requirements.
- (4) Performance figures for simulated plant operation – By using the international standard modelling and assessment software packages, the operation of 140 plant designs were simulated and evaluated.
- (5) Capital cost estimates, O&M figures and life-cycle costs will be calculated. The environmental and social impacts on the region, due to the implementation of STE technologies will be assessed – Through consultation with manufacturers and suppliers, accurate capital cost estimates were determined. Industry provided the basis for O&M calculations and the life-cycle costs for the plant designs were calculated.
The environmental and social impacts were gauged in terms of the reference site and area chosen. Since other regional sites would be reasonably similar to the reference area, the impacts would be transferable to other regional sites.

- (6) Evaluation of the viability of STE implementation – The viability of STE power plants was expressed in terms of the cost of the systems, the cost of the electricity produced over the life of the plant, the technical viability and ability to dispatch as required by regional usage patterns.

It is clear from the results that STE does not offer any possibility of being a baseload option for the region, since Eskom provides low-cost baseload power throughout the region.

However, the results showed that STE technologies could find a niche application as a peak power option, if thermal storage is incorporate.

- (7) Final report, presentations and publications – The results obtained through this study have been presented at three forums:

Internally to Eskom line groups and management,

To the South African government and other electricity supply industry stakeholders (including the World Bank) and

At the 60th meeting of the Executive Committee of the the International Energy Agency's program on solar power and chemical energy systems (SolarPACES), held in Cuernavaca in Mexico (May 2001).

The final report is currently being compiled for submission to Eskom management, following the evaluation of a draft report and changes requested from the consultant.

By joining SolarPACES, Eskom and the project team were exposed to the existing GEF projects and interacted with the project leaders and developers. Lessons have been learnt in the procedural problems experienced by most of these projects.

- 8) Issues that arose during implementation and any lessons learned:

No technical problems were experienced during the completion of this project.

Problems that were experienced were:

- Confusion resident within the GEF upon receiving and classifying the project proposal, resulting in time delays.
- Extensive delays within the World Bank's South African country office with finalizing the grant agreement letter. This resulted in the project being 50% completed before the grant was available to the project.
- Inability of the Eskom Enterprises' (TSI Division) financial department to timeously provide the details to the project special account to enable the deposit of the grant funding.

Lessons learned: Co-ordinate with all interested and affected parties upon the project kickoff. This should include external as well as all internal parties to avoid misunderstandings.

- 9) List any changes from original financing plan:

Project budget as originally submitted to the GEF

| Component | GEF | Other Sources | Project Total |
|---------------|---------|---------------|---------------|
| Preparation | 0 | 25,000 | 25,000 |
| Personnel | 210,000 | 120,000 | 330,000 |
| Training | 5,000 | 10,000 | 15,000 |
| Travel | 15,000 | 5,000 | 20,000 |
| Miscellaneous | 0 | 20,000 | 20,000 |
| Total | 230 000 | 180 000 | 410 000 |

South Africa Solar Thermal MSP - Procurement Plan

| Activity | Procurement Basis | Cost (US\$) |
|--------------------------------|-------------------|-------------|
| Consultancy Services | | |
| Solar Thermal Technology Study | Sole Source | 160,000 |
| Operational Expenses | | |

| | | |
|----------------------------------------|-----|--------|
| Local & international travel | SOE | 25,000 |
| Workshop, Report preparation, printing | SOE | 17,500 |
| Miscellaneous | SOE | 27,500 |

The initial budget, submitted and approved by the GEF, assumed that the GEF grant would in part be used to cover manpower costs, not associated with the consultant's costs. This was not the case (not an approved expense by the World Bank) and the expenses were reallocated mid way through the project.

Updated financial expenditure up to end of project

| Component | GEF | Eskom | Project Total (US\$) |
|----------------------|----------------|-------------------------|----------------------|
| Preparation | 0 | | |
| Personnel | 0 | R558,963 or \$79,852 | 79,852 |
| Consultant | \$175,040 | \$4,500 | 179,540 |
| Training | 0 | 0 | 0 |
| Travel & Subsistence | 0 | R62,155.96 or \$8,879 | 8,879 |
| Other: | 0 | R102,091.88 or \$14,585 | 14,858 |
| Feedback Workshop | | R3,596.49 | |
| Courier Services | | R913.54 | |
| Maps | | R786.91 | |
| SolarPACES | | R71,893.30 | |
| Cost of Cover | | R24,901.64 | |
| Total (US\$) | 175,040 | 107,816 | 282,856 |

Amounts shown include actuals up to 30/04/2001, as well as projected expenses to 31/05/2001. The conversion rate used is R7 = \$1, an average over the lifetime of the project.

- 10) Attach the grant recipient/executing agency's latest statement of account showing the use of the MSP grant funds and externally audited financial statements together with the opinion of the external auditors on such statements, including review date, period covered, and relevant documents [as per grant agreement].

Due date of statement of account and external audit:

Received by task manager: Yes

Period cover:

Results: unqualified

- (11) Comments by task manager: This project was successful in that it produced a full evaluation of the prospects for solar thermal electric power generation in South Africa. Based on this, ESKOM Enterprises has confirmed their interest in proceeding with project development. As a measure of their interest and commitment, they have decided to proceed with the next phase (detailed design) without accessing further GEF support. However, they have expressed interest in GEF support for an STE investment. I have made clear that GEF experience with other similar investments, none of which have yet come to fruition, would be a consideration in their review of STE investment support in South Africa.