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UNDP/GEF Solar Water Heaters (SWHs) for Urban Housing in South Africa

Final evaluation

Final Report

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Table of Contents

	List of Tables	3
	List of abbreviations	4
	1. Executive summary	5
50	1.1. Brief description of project	6
	1.1.2. Implementation strategy	7
	1.1.3. Environmental objectives	7
	1.1.4. Developmental objectives	8
	1.2. Context and purpose of the evaluation	8
	1.3. Main conclusions, recommendations and lessons learned	8
	2. Introduction	10
	2.1. Purpose of the evaluation	10
	2.2. Key issues addressed	10
	2.3. Methodology of the evaluation	10
60	2.4. Structure of the evaluation	11
	3. The project and its development context	12
	3.1. Project start and its duration	12
	3.2. Problems that the project sought to address	12
	3.3. Immediate and development objectives of the project	12
	3.4. Result areas	13
	3.4.1. Result 2: Standard implementation, test rig upgrade and capacity improvement	13
	3.4.2. Result 3: Codes of practice for installation and maintenance	14
	3.4.3. Result 4: Training of installers and maintainers	14
	3.4.4. Result 5: Awareness on the supply side	14
70	3.4.5. Result 6: Market survey	14
	3.4.6. Result 7: Financial mechanisms for wholesale and retail financing	15
	3.4.7. Result 8: Awareness and promotion on the demand side	15
	3.4.8. Result 9: Affirming demonstration	16
	3.4.9. Result 10: Enhanced local planning and financing capacity for future projects	16
	3.5. Main stakeholders	16
	3.6. Results expected	17
	4. Findings and Conclusions	19
	4.1. Project Formulation	19
80	4.1.1. Conceptualization/Design (R - satisfactory).	19
	4.1.2. Country-ownership/Driveness.	19
	4.1.3. Stakeholder participation (R - satisfactory)	19
	4.1.4. Replication approach.	20
	4.2. Project Implementation	20
	4.2.1. Implementation Approach (R - satisfactory).	20
	4.2.2. Monitoring and evaluation (R - Satisfactory)	21
	4.2.3. Stakeholder participation (R - satisfactory)	21
	4.2.4. Financial Planning	22
	4.2.5. Sustainability	22
	4.2.6. Execution and implementation modalities.	22
90	4.3. Results	24
	4.3.1. Attainment of Outcomes/ Achievement of objectives (R - Satisfactory)	24

	5. Recommendations	29
	6. Lessons learned	30
	7. Evaluation report Annexes	31
	7.1. Evaluation Terms of Reference	31
	7.2. List of persons interviewed or completing questionnaires	43
	7.3. List of documents reviewed	43
	7.3.1. Set of documents received on 26 Feb 08	44
	7.4. Questionnaire used and summary of results	45
100	7.4.1. Questionnaire	45
	7.4.2. Summary of results	50
	7.5. UNDP Project Document	51
	8. Presentation of findings to project closure event 4Jun08	116
	Notes	118

List of Tables

	Table 1 Summary rating of project elements	5
	Table 2 Evaluation structure summary table	11
	Table 3 Logical framework matrix: Immediate project objectives	12
110	Table 4 Logical framework matrix: Environmental and developmental objectives	13
	Table 4 Subsidy allocation per system size	15
	Table 5 Rating of stakeholder participation in project design	19
	Table 6 Indicators of achievement of project objectives	24
	Table 7 Summary of rated evaluation elements	50

List of abbreviations

APM	Assistant Project Manager
CEF	Central Energy Fund (Pty) Ltd.
CoP	Code of Practice
CO₂e	Carbon Dioxide equivalent
DME	Department of Minerals and Energy
EDC	Energy Development Corporation (a division of CEF (Pty) Ltd.)
GEAR	The Growth Economic development And Reconstruction economic strategy of the South African government
GEF	Global Environmental Facility
kt	Kilo Tons (a unit of measurement of mass equal to one thousand Kilograms)
M&E	Monitoring and Evaluation
Mt	Mega Tons (a unit of measurement of mass equal to one thousand kt.)
NGO	Non Governmental Organisation
PAC	Project Advisory Committee
PIR	Project Interim Report
PM	Project Manager
PMU	Project Management Unit
PSC	Project Steering Committee
RE	Renewable Energy
SABS	South African Bureau of Standards
SADC	South African Development Community (14 countries in Sub-Saharan Africa)
SESSA	Sustainable Energy Society of Southern Africa
SWH	Solar Water Heater
UNDP	United Nations Development Programme
USD	United States Dollars or US\$ (currency)

1. Executive summary

120 The purpose of the UNDP/GEF funded Solar Water Heaters (SWHs) for Urban Housing project was stated in broad terms as:

‘transforming the market for SWH in South Africa through barrier removal and creating a susceptible [SWH] market environment in South Africa’.

The project oversaw the installation of 500 incentivised Solar Water Heaters (SWHs) in middle to higher income urban households and standardised the national SWH quality and testing regime. In addition, the project sought to consolidate a widened distribution and maintenance infrastructure, offer attractive financing options and ensure continued public awareness and involvement on both the supply and the demand-side.

130 The project had two main objectives, one environmental and the other developmental. Environmentally the project contributed to the stabilisation of global climate by reducing greenhouse gas emissions by 1.2 kt CO₂e annually by 2008. The market impetus created may see these numbers elevate nationally to savings from as many as 1 million anticipated systems in the national utility-led programme over the next 5 years (to 2013). From the associated developmental perspective the project can indeed be seen to have improved the quality, accessibility, affordability of solar water heaters and increased job prospects within the South African SWH industry. This result has been validated by stakeholders through a survey and statistical analysis of the numerical results.

140 The end result of the programme will now almost undoubtedly be a higher uptake of this technology from the middle-income residential sector through the national rollout programme positioned as a key strategy in alleviation of the current national electricity supply capacity shortage.

Table 7 summarises the indicators used for the measurement of the achievement of the project objectives. It is therefore the conclusion of this evaluation that, based on the project indicators developed the project was a clear success.

For the purpose of this evaluation, the project cycle has been broadly broken down into project:

- formulation comprising conceptualisation and design,
- implementation and
- results or outcomes

150 The analysis of achievement of the project objectives, the objective of the evaluation as stated explicitly in the original project document, based on project formulation, implementation and achievement of intended results, found generally that the above three categories of the project were rated as follows:

Table 1 Summary rating of project elements

Project element	Rating	Numerical stakeholder average (6 = Highly Satisfactory 1 = Highly Unsatisfactory)
Formulation	Satisfactory	4.6
Implementation	Satisfactory	4.2
Results	Satisfactory	4.5

One of the clearest successes of the solar water heaters for urban housing project is clearly the creation of a standardised product range and a facility for testing of these.

160 Following consultation with DME and UNDP/GEF project proponents, this evaluation has sought to document the specific lessons to be gleaned for solar water heaters in South Africa. These include:

- The creation of conditions for organic market growth is valuable in attaining sustained uptake of renewable energy technologies. These include a standardised quality and product testing regime, a widened distribution and maintenance infrastructure and increasing and continued public awareness.

- 170
- These in turn lead to increased job prospects within the South African SWH industry.
 - Symptoms of so called ‘pioneer’ markets must be recognized and addressed in the creation and/or support of industry bodies.
 - Public education and awareness creation is demanding and expectations require careful management
 - Monitoring and evaluation must be put in place early in the project and continue throughout to the terminal evaluation
 - Transitions between staff changes need to be seamless with focussed on knowledge management and effective archiving of information
 - A repository for final document outputs must be created and accessible beyond closure of the project.

1.1. Brief description of project

The title of the project was:

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Solar Water Heaters (SWHs) for Urban Housing in South Africa

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The South African Solar Water Heating (SWH) market has considerable potential to leverage electricity savings, increase employment opportunities, improve electricity demand management and reduce greenhouse gas emissions. Although a wide range of products is available on the market, the industry is faced with severe limitations in terms of SWH standardisation, awareness, affordability and financing, which ultimately prevents widespread technology adaptation. Following up on the FINESSE¹ strategy, the project aimed at transforming the market for SWH in South Africa by tackling these barriers and creating a susceptible market environment. The project sought to install and subsidise a minimum of 500 Solar Water Heaters (SWHs) in urban households, while in parallel standardizing the SWH quality and testing regime, consolidating an enwidened distribution and maintenance infrastructure, offering low-interest financing options and ensuring continued awareness and involvement on both the supply- and the demand-side. Building on the favourable conditions prevailing at the end of the project, a second phase of the market transformation was to be initiated. This second phase was to have enabled installation of a further 9 000 SWHs over a period of 5 years, with the ultimate goal being to further bridge affordability gaps and make the benefits of SWH available to low-income households.

1.1.1.1. Expected end of project situation²

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After completion of the project, South African SWH producers, retailers, installers, maintainers, operators and customers were to benefit from the following key improvements:

- Improved mechanical and thermal performance tests for SWHs being operational, thus increasing product quality and confidence in the technology;
- New and present SWH retailers, installers and maintainers following an industry-wide code of practice and forming part of a wider customer support infrastructure;

¹ FINESSE is a UNDP strategy to develop businesses that facilitate the purchase of renewable energy and energy efficiency technologies by small-scale energy users.

² The project implementation strategy in the project document indicates that: “Upon successful completion of Phase 1 the project will enter into Phase 2 which shall be funded by a variety of governmental, development and financial instiwtions. GEF funding will not be available for Phase 2. An important link between Phase I and Phase 2 is a sustainably supported market environment (standards, awareness, promotion, economies of scale), and a dedicated business case which will be prepared in parallel to the evaluation of the project and under consideration of the lessons learned. This business case will include analysis and prognosis of the following data:

- Performance of SWH units in Phase 1
- Customer feedback and satisfaction
- Development of the demand curve
- Electricity savings and payback potential for households
- Market potential and demand (survey)
- Comparison of different financial models

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- A critical number of potential SWH retailers and installers in the building, plumbing and electrical industry is aware of SWH technology, its competitive advantages, potential suppliers, SWH quality control and customer support structures, and SWH pricing and financing;
 - Market data on customer preferences and SWH demand is available and accessible for delineation of SWH-related business opportunities and follow-up projects;
 - Tailor-made financial mechanisms for SWH wholesale and retail financing are available and readily accessible by businesses and customers;
 - A critical number of communities, households and potential customers is aware of SWH benefits, accessibility and affordability;
 - 500 SWHs are demonstrated in urban medium-income areas, and their respective economic, environmental and health benefits are continuously documented;
 - A follow-up project has been designed for further transition of SWH technology to low-income households.

1.1.2. Implementation strategy

220 The 5 year project was to be implemented in two phases. During Phase 1 (30 months) all activities as described above were to be carried out using GEF and CEF (Pty) Ltd research and development funds. Phase 1 was to focus on areas where households were already accustomed to using hot water. Upon successful completion of Phase 1 the project would enter into Phase 2 which was to be funded by a variety of governmental, development and financial institutions. GEF funding will not be available for Phase 2. An important link between Phase 1 and Phase 2 was to be a sustainably supported market environment (standards, awareness, promotion, economies of scale), and a dedicated business case which was to be prepared in parallel with the evaluation of the project and under consideration of the lessons learned. This business case was to include analysis and prognosis of the following data:

- 230
- Performance of SWH units in Phase 1
 - Customer feedback and satisfaction
 - Development of the demand curve
 - Electricity savings and payback potential for households
 - Market potential and demand (survey)
 - Comparison of different financial models

Phase 2 was to be focussed on all market segments (e.g. low-middle income households + high income households). The dedicated financing schemes, which were to have been designed and tested under phase 1, were to be put in place during phase 2, particularly aimed at the low middle income household segment.

1.1.3. Environmental objectives

240 The project had two main objectives, one environmental and the other developmental.

The environmental objective of the project was a contribution to climate stabilisation by reducing CO₂ emissions measured in Mt CO₂e per annum. Environmentally the project contributed to the stabilisation of global climate by reducing greenhouse gas emissions by approximately 1.2 kt CO₂e annually by 2008. The market impetus created may see these numbers elevate nationally to savings from as many as 1 million anticipated systems in the national utility-led programme over the next 5 years (to 2013), equivalent to the mitigation of 2.3 Mt CO₂e annually.

1.1.4. Developmental objectives

250 From the associated developmental perspective the project sought to improve the quality, accessibility and affordability of solar water heaters and to increase job prospects within the South African SWH industry. The end result of the project was to be a higher uptake of this technology from the middle-income residential sector.

It was the intention that these should be verifiably measurable by considering the following indicators:

- Retail price development of SWHs over time
- Number of SWHs installed in middle-income areas
- Number of SWHs installed in low-income areas
- Number of jobs created

260 1.2. Context and purpose of the evaluation

The purpose of this evaluation was to assess the project's progress towards its objectives and goals as contained in the original UNDP/GEF project document and log-frame and any modification thereto as approved during periodic review. The evaluation intended determining a rating of the extent to which the project's objectives (environmental and developmental) were achieved and to seek stakeholder input to these in validation of the general findings.

In assessing the project experiences, numerous positive, general conclusions were drawn that may assist any further solar water heater dissemination efforts, in other countries and contexts. The review assessed the activities carried out over the period during which GEF/UNDP support was received for the project.

270 This evaluation was commissioned by the Project Management Unit, on request of the GEF focal point, and in compliance with statutory requirements to evaluate all medium-sized GEF funded projects on their completion. Given the pioneering nature of the project, the reviewers endeavoured to assess progress based not only on the originally proposed strategy, but also on the project's response to emerging realities. It was the intention of the evaluators that as many of the project's primary stakeholders as possible be involved in the evaluation.

280 A questionnaire was therefore, prepared which sought to gather input to the UNDP/GEF component of the Urban SWH project's final evaluation from participants and stakeholders. It included a description and rating of the extent to which the project's objectives (environmental and developmental) were achieved using Highly Satisfactory, Satisfactory, Marginally Satisfactory, Marginally Unsatisfactory, Unsatisfactory and Highly Unsatisfactory ratings. The broad structure of the questionnaire was:

- Project design
 1. Conceptualisation
 2. Stakeholder participation
- Project implementation
 3. Implementation approach
 4. Monitoring and evaluation
 5. Stakeholder participation
- 290 • Project results
 6. Achievement of objectives
 7. Sustainability of these outcomes

1.3. Main conclusions, recommendations and lessons learned

The project had two main groups of objectives, one environmental and the other developmental. Environmentally the project contributed to the stabilisation of global climate by reducing greenhouse gas emissions by 1.2 kt CO₂e annually by 2008. The market impetus created may see these numbers elevate nationally to savings from as many as 1 million anticipated systems in the national utility-led programme over

300 the next 5 years (to 2013). From the associated developmental perspective the project can indeed be seen to have improved the quality, accessibility, affordability of solar water heaters and increased job prospects within the South African SWH industry. This result has been validated by stakeholders. The end result will now almost undoubtedly be a higher uptake of this technology from the middle-income residential sector through the national rollout programme positioned as a key strategy in alleviation of the current national electricity supply capacity shortage.

2. Introduction

2.1. Purpose of the evaluation

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The purpose of this final project evaluation was stated as assessing the project's progress towards its objectives and goals as contained in the original UNDP project document and log-frame and any modifications as approved during periodic review.

2.2. Key issues addressed

The project cycle was broadly categorised by project:

- formulation comprising conceptualisation and design,
- implementation and
- results or outcomes.

2.3. Methodology of the evaluation

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The methodology used included:

- A review of the documentation as listed in section 7.3
- Interviews with the people listed in section 7.2
- The questionnaire as found in section 7.4 was distributed to interviewees prior to the one-on-one or telephonic structured interview and the results consolidated in section 7.4.2. Electronic recordings of the interviews were retained for reference purposes.

The evaluator spent approximately 56 hours in the offices of the CEF between 29 February 2008 and 11 July 2008 and working with the PMU and PM.

2.4. Structure of the evaluation

330 The elements of the evaluation are summarised in Table 2

Title	Subtitle	Elements assessed	Elements Rated	Elements rated by stakeholders
Formulation	Design	5	2	2
	Stakeholders			
Implementation	Approach	6	3	4
	M&E			
	Stakeholders			
Results	Objectives	3	1	1
		14	6	7

Table 2 Evaluation structure summary table

The 6 elements rated were informed by a statistical consolidation of 18 sub-elements rated by project respondents during interviews. The table above provides the key to this consolidation from the base data obtained and analysed in Table 8.

3. The project and its development context

3.1. Project start and its duration

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The period under review in this evaluation was the full duration of the project from the anticipated start date in preparation of the project document in November 2003 to the final closure in May 2008.. The estimated project period as per the project document was from November 2003 and April 2006. A cost neutral extension provided by GEF extended the project duration from 30 to 55 months. The revised closing date was the May 2008 during which time this terminal project evaluation was concluded

The GEF project brief and project documents were developed in 2003. This represents the GEF project conceptualisation. It is captured in the GEF project document (Section 7.5) developed between the Department of Minerals and Energy (later mandated to CEF) as the implementing agent and the UNDP country office.

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3.2. Problems that the project sought to address

Broadly the problems which the programme set out to address are stated in the project document in saying that "Although a wide range of products is available on the market, the industry is faced with severe limitations in terms of SWH standardization, awareness, affordability and financing, which ultimately prevents widespread technology adaptation.

The project, therefore, can be seen to have been designed to remove the following barriers:

- severe limitations in terms of SWH standardisation,
- awareness,
- affordability and
- financing.

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3.3. Immediate and development objectives of the project

The project's immediate objectives as per the logical framework matrix of 2003 were:

Table 3 Logical framework matrix: Immediate project objectives

NARRATIVE SUMMARY	OBJECTIVELY VERIFYABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
To enable operation of a transparent project management	PMU, AC, responsibilities, meeting schedule, workplan, budget, timetable are in place and continuously monitored	Meeting minutes (AC, TPR), meeting schedule, inception report, PIR reports	
Improve & consolidate standardising, testing, quality management and customer care procedures for SWH producers, installers & maintainers	Improvements on SABS testing equipment (rig), Number of tests performed per month Number of supplier products certified Number of SWH retailers/installers/maintainers certified in Code of Practice	SABS reports, field visits, monitoring protocols	
To increase SWH awareness and competencies among retailers, installers	Number of SWH retailers/installers/maintainers trained & certified Number of Suppliers informed	Certification protocols, Expressions of interest received by producers / SESSA, publications	

NARRATIVE SUMMARY	OBJECTIVELY VERIFYABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
and maintainers	and linked with producers / wholesalers Number of articles published	in industry media	
To increase understanding of the national SWH market and delineate instruments for market transformation	Number of follow-up and spin-off projects Number of new SWH businesses Number of financial institutions offering low interest SWH financing	SWH loan models in banks, market survey report, business plans	
To ensure SWH awareness and demonstration through a subsidy and financing scheme	Number of systems installed, maintained and monitored Number of spin-off campaigns and projects created	Business plans, municipal energy plans considering SWH	
To ensure project replicability and follow-up	Written commitment from stakeholders to plan and finance phase 2	Phase 2 workplan, EOIs from government & banks	

The projects development and environmental objectives were captured in the original logframe as follows:

Table 4 Logical framework matrix: Environmental and developmental objectives

NARRATIVE SUMMARY	OBJECTIVELY VERIFYABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
Environmental objective is climate stabilisation by reducing CO2 emissions	Quantified CO2 emission reductions	National GHG inventories Reports to UNFCCC	
Development Objective is to improve the quality, accessibility, affordability and job prospects of SWHs in South Africa and transform the market from the middle-income sector	- Retail price development of SWHs over time - Number of SWHs installed in middle-income areas - Number of SWHs installed in low-income areas - Number of jobs created	- Free market information - Project phase 1 final report - Business case for phase 2	The price of Water Heating alternatives does not decrease

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3.4. Result areas

The above two objectives were pursued through the following 9 result areas:

3.4.1. Result 2: Standard implementation, test rig upgrade and capacity improvement

3.4.1.1. Apply revised Standards with South African SWH producers

The new standard has been completed and accepted at the South African Bureau of standards (SABS). A final minor amendment is to be made to include vacuum tube solar water heaters. The new national SABS standard is SANS1307-2007. The SABS is currently in the process of finalising a protocol for recognising/accepting foreign quality standards for solar water heaters. The SABS has submitted a public

380 request to adopt the ISO standards for collectors. It is envisaged that the European Standard for Solar Collectors will be adopted. SABS will provide an update upon approval.

3.4.1.2. Revise current tests and upgrade thermal test rig

The current tests and procedures are in accordance with SANS1307 - 2007, there is a thermal efficiency test (Indoor test and outdoor test), and a mechanical strength test (SANS 1210-1992) to ensure compliance to SANS1307-2007.

3.4.2. Result 3: Codes of practice for installation and maintenance

3.4.2.1. Design Code of Practice (CoP) for installation, operation and maintenance of SWHs

390 The Code of Practice (CoP) for installation and maintenance of domestic Solar Water Heaters has been published by the South African Bureau of Standards (SABS) in August 2006. Once finalised the SABS will house and update the CoP as required or requested by industry.

3.4.3. Result 4: Training of installers and maintainers

3.4.3.1. Facilitate training & certification of present SWH installers and maintainers

400 The training manual has been completed and the CoP has been included in the final manual. The training has ensured that an installer is compliant with the CoP and the SAQA requirements. Training programs were run (in Durban, Cape Town and Gauteng) in two full programmes, the first program trained all current installers and the latter trained new installers whom comply with the necessary criteria. Testing began on 15 January 2007 and was completed by the end of February 2007. Two weeks of training was conducted in each province.

3.4.3.2. Facilitate training & certification of new SWH installers and maintainers

The training manual has been completed. Training schedules have been drafted and all the manufacturers and suppliers who submitted a tender have been approached to complete the training through their installers. The first Recognition of Prior Learning (RPL) round took place in Pretoria in January 2007.

3.4.4. Result 5: Awareness on the supply side

3.4.4.1. Conduct national SWH symposium

410 The Project Team decided to become a Platinum sponsor in a SWH Workshop which was held on 29 March 2007. This workshop sought to facilitate the awareness – raising issues on the Supply side. The workshop was held by an NGO, REEEP (Renewable Energy and Energy Efficiency Partnership).

3.4.4.2. Draft & publish SWH articles in media

Articles were prepared and published on a regular basis. A contract was secured with Independent Online to publish Full page Broadcasts in the following newspapers: The Star, Pretoria News, Cape Argus, Daily News and IOL with about 1,6 million readers countrywide. Prominent articles were published in weekend newspapers like the Saturday Star and PTA Weekend on the 7th March, 4th April and 2nd May 2007.

420 3.4.5. Result 6: Market survey

3.4.5.1. Conduct interview-based market survey



The market survey was completed by SolaSure, accepted and validated by UCT.

3.4.6. Result 7: Financial mechanisms for wholesale and retail financing

3.4.6.1. Elaborate financial strategy for SWH sales

The SWH 500 project completed research pertaining to financing SWH for middle to higher income households in South Africa. This research indicated to the PMU that there is no real need for an elaborate financing mechanism but rather a “marketable” product. The project therefore adopted a National roll out campaign for the three provinces.

430 The table below shows the subsidy allocation on a per litre basis.

Table 5 Subsidy allocation per system size

Time frame	200 liter system	300 liter system
Start of 1st to end of 2nd month or first 200 systems	5000 ZAR	6000 ZAR
Start of 3rd to end of 4th month or second 200 systems	4000 ZAR	5000 ZAR
Start of 5th to end of 6th month or last 100 systems	3000 ZAR	4000 ZAR

500 systems were sold based on this scheme in a period of 4 months.

3.4.7. Result 8: Awareness and promotion on the demand side

3.4.7.1. Design public media campaign

Basic strategic planning was completed and CEF’s internal Public Relations Department agreed to assist manufacturers to market their products by conducting a Workshop for them once they began the roll-out.

440 As agreed by the PAC, the project was a “Platinum” sponsor in the REEEP (Renewable Energy and Energy Efficiency Partnership) SWH workshop held on 29th March 2007 in Pretoria.

3.4.7.2. SWH marketing in print media

Articles were prepared and published on a regular basis. A contract was secured with Independent Online to publish Full page Broadcasts in the following newspapers: The Star, Pretoria News, Cape Argus, Daily News and IOL with about 1,6 million readers countrywide. Prominent articles were published in weekend newspapers like the Saturday Star and PTA Weekend on the 7th March, 4th April and 2nd May 2007.

3.4.7.3. SWH promotion at home- and trade fairs

450 The PMU procured two SWH systems to be used at exhibitions, conferences and general awareness events. The one unit was on full-time display at a science expo centre and the other is mobile.

3.4.8. Result 9: Affirming demonstration

3.4.8.1. Define demonstration scope

The demonstration areas were decided as the "golden triangle". The scope was an equal split of SWHs through KwaZulu Natal, Western Cape and Gauteng; hence 167 units per area (166 in KwaZulu Natal). A minimum of 30 units were installed in each sectoral area.

460 The project was implemented in 3 areas, namely Western Cape, KwaZulu Natal and Gauteng in an equal distribution. Installations were done in middle and higher income groups so as to facilitate additional research and evaluation possibilities for all income groups and areas.

21 Proposals were received from SWH manufactures to be part of the SWH 500 project.

3.4.8.2. Sell 500 subsidised SWH systems to customers in medium-income areas

Cape Town: All 167 units were sold in this area.

Durban: All 167 units were sold in this area.

470 Johannesburg: The response from this area was extremely positive and all 167 units were sold in this area.

3.4.9. Result 10: Enhanced local planning and financing capacity for future projects

3.4.9.1. Conduct communal SWH facilitation missions

The project continually interacted with municipalities on a project status and collaboration basis. The project assisted the Johannesburg municipality in developing a call for proposals for Solar Water Heating tender for a local eco-development. This result area will only be fully operational after the preliminary results are available after installation.

480 3.4.9.2. Result 11: Project Replicability

Global Best Practice: The global best practice has been completed and the report is available from CEF with the PMU approval.

Insurance Modelling: The SWH 500 has leveraged funds from SANERI to research the possibility of rolling out SWHs through the insurance industry replacement market. The final report became available at the end of November 2006.

3.5. Main stakeholders

490 The main stakeholders were the GEF/UNDP local Pretoria office, the Department of Minerals and Energy, private sector interests, industry associations, and the Energy Development Corporation.

Stakeholders (and their anticipated role at inception) as listed in the original project document and against which stakeholder participation and consultation were measured in the evaluation questionnaire were:

CEF (Pty) Ltd
Role: Executing Agency

UNDP South Africa
Role: Implementing agency

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- Department of Minerals and Energy (DME)
Role: National political authority.
Main benefits: Increasing of renewable energy mix in line with policies
- Department of Environmental Affairs and Tourism (DEAT)
Role: GEF focal point
- 510 Sustainable Energy Society of Southern Africa (SESSA)
Role: SWH industry association
Main benefits: promotion of member products
- South African Bureau of Standards (SABS)
Role: National Standards & testing authority
Main benefits: Improved testing infrastructure, improved standard enforcement
- South African Development Bank (DBSA)
Role: Loan guarantees in Phase 2
- 520 National/regional/local financial institutions
Role: Loan financing
Main benefits: Increased customer base & capital
- Electricity suppliers (e.g. ESKONJ)
Role: Potential investors, electricity price movers, research
Main benefit: Reduction of electricity peaks, reduction of capacity
- 530 SWH producers
Role: Suppliers, wholesalers, testers, monitors
Main benefit: Marketing, economies of scale (price reduction), subsidy scheme
- SWH retailers/installers/maintainers
Role: Retailing, Customer Relationship Management, entry points for financing, monitoring
Main benefits: Training, certification, business and finance support
- SWH customers
Role: Purchasing, market data and feedback provision
Main benefits: Cheaper products, electricity savings, no emissions
- 540 Local/regional authorities
Role: Purchasing, market data and feedback provision
- Other pilot projects (e.g. by USAID/Winrock 1nt.)
Role: Sharing of lessons learned and complementarity of current and future effort

3.6. Results expected

The expected project results at project conceptualisation were captured as follows:

- 550 "After completion of the project, South African SWH producers, retailers, installers, maintainers, operators and customers will benefit from the following key improvements:
- Improved mechanical and thermal performance tests for SWHs are operational, thus increasing product quality and confidence in the technology;
 - New and present SWH retailers, installers and maintainers follow an industry-wide code of practice and form part of a wider customer support infrastructure;

560

- A critical number of potential SWH retailers and installers in the building, plumbing and electrical industry is aware of SWH technology, its competitive advantages, potential suppliers, SWH quality control and customer support structures, and SWH pricing and financing;
- Market data on customer preferences and SWH demand is available and accessible for delineation of SWH-related business opportunities and follow-up projects;
- Tailor-made financial mechanisms for SWH wholesale and retail financing are available and readily accessible by businesses and customers;
- A critical number of communities, households and potential customers is aware of SWH benefits, accessibility and affordability;
- 500 SWHs are demonstrated in urban medium-income areas, and their respective economic, environmental and health benefits are continuously documented;
- A follow-up project has been designed for further transition of SWH technology to low-income households.”

4. Findings and Conclusions

570 In addition to a descriptive assessment, all criteria marked with (R) have been rated using the divisions: Highly Satisfactory (6), Satisfactory (5), Marginally Satisfactory (4), Marginally Unsatisfactory (3), Unsatisfactory (2) and Highly Unsatisfactory (1)³. In collecting inputs to the rating process, stakeholders were asked, likewise, to rate the required elements using this hierarchy during interviews following the questionnaire as in 7.4.1. Thereafter, an averaging of the results was obtained by assigning the numerical values as above in parenthesis. The results obtained are summarised in Table 8.

4.1. Project Formulation

4.1.1. Conceptualization/Design (R - satisfactory).

580 The approach used in design and an appreciation of the appropriateness of problem conceptualization was considered by stakeholders to have been satisfactory. As reflected in the numerical outcome of the first question (4.8) of the questionnaire process, the selected intervention strategy was considered by interviewees to be:

- suitably ambitious (proponents note that this is not uncommon for development projects) yet realistic
- adequately informed by the stakeholders and prospective market (see low of question 2.3 of the questionnaire: 'Stakeholder participation in the design phases')

590 The average response to a rating of the project design was equivalent to a majority response of 'satisfactory' in both overall conceptualisation and stakeholder participation in the design process. It is worth noting that many of the respondents were not directly involved in the project conceptualisation process. In fledgling industries, longer term projects can be hampered in this regard given that stakeholders may change in a short space of time and could therefore be considered to be an artefact of medium term projects. The score here could hint at an artefact of the evaluation methodology. As will be seen in the assessment of the project implementation the lack of continuity in use of the logframe was problematic.

4.1.2. Country-ownership/Drivenness.

Solar water heaters have generally not received the kind or level of support from national government which electrical supply options and other efficiency options receive. The SWHs for urban households project has gone some way to elevating solar water heating in the national policy and long term strategy environments.

4.1.3. Stakeholder participation (R - satisfactory)

600 This section deals with stakeholder participation in project design. Stakeholder participation during project implementation is dealt with in section 4.2.3. Interviewees rated aspects of stakeholder participation in project conceptualisation as follows:

Aspect of participation	Evaluator rating according to GEF/UNDP rating system	Numerical outcome
Information dissemination,	Satisfactory	4.4
Consultation,	Satisfactory	4.2
"Stakeholder" participation in design stages.	Satisfactory	4.6

Table 6 Rating of stakeholder participation in project design

³ Questionnaires were based on the old 4 point scoring method and a simple logarithmic transfer function was used to transpose these to the 6 point scoring system.

The overall impression of stakeholder participation during the design phases of the project was that it was satisfactory.

4.1.4. Replication approach.

610

The market can be considered to be in a 'pre-commercial market' phase. What this project sought essentially from a UNDP perspective was to move the market closer to a commercial market in a phase sometimes referred to as a 'pioneer market'. This model is applicable to other sectors and technologies. It remains to be seen whether mass uptake of solar water heaters will take place given that the current incentive level of approximately 30% of capital cost.⁴

4.2. Project Implementation

4.2.1. Implementation Approach (R – marginally satisfactory).

This should include assessments of the following aspects:

620

- (i) The use of the logical framework as a management tool during implementation and any changes made to this as a response to changing conditions and/or feedback from M and E activities if required. (Rating: 2.6 or marginally unsatisfactory)

The project was designed and set underway with a logical framework. Use of the logical framework was varied and ad hoc. The most recent version of a logframe proxy included in this evaluation was taken from the final PIR dated September 2007.

- (ii) Other elements that indicate adaptive management such as comprehensive and realistic work plans routinely developed that reflect adaptive management and/or; changes in management arrangements to enhance implementation (Rating: 3.7 or marginally satisfactory).

630

The project document and logframe could have received more attention from the members of the PMU. There were major changes over the course of the project through adaptive management of the project. The need for a project logframe was necessary to provide boundaries within which adaptive management could proceed.

- (iii) The project's use/establishment of electronic information technologies to support implementation (3.9), participation (4.3) and monitoring (4.0), as well as other project activities (Rating: 4.5 or satisfactory).

640

This aspect appears to have been generally satisfactory.

- (iv) The general operational relationships between the institutions involved and others, and how these relationships have contributed to effective implementation and achievement of project objectives.

The financial and managerial responsibility lies with the government to achieve the objectives of the project as a nationally executed project. The national execution responsibility was delegated to the CEF. This aspect of evaluation had the largest range of responses, from unsatisfactory to highly satisfactory. The average response pointed to the relationship between the project the GEF and other institutions being generally good. Relationships with industry and commercial partners were found to be strained at times.

650

⁴ The Sustainable Energy Society of Southern Africa has through its Solar Water Heating Division, acting as the solar water heating industry association suggested a higher incentive level based on load and energy savings modelling undertaken in early 2008. The outcome of a submission by Eskom to NERSA on the matter was not available at the time of writing.

- (v) Technical capacities associated with the project and their role in project development, management and achievements.

The project and the project management unit operated in an institutional and market context. The technical capacity of the 4 (four) project managers, assistant project manager as well as the contracted sub-consultants was varied and there was a high turnover of staff. There were also some problems with relatively high turnover amongst support personnel.

4.2.2. Monitoring and evaluation (R – Marginally Satisfactory)

660 Assessment by project participants and the project steering committee as to whether there had been adequate periodic oversight of activities during implementation was generally favourable. This element received the numeric score of 4.4. The annual project reports appear to have become more thorough as the project has progressed. The periodic absence of clear logical framework matrix and therefore indicators is perhaps the reason for less than sterling monitoring. It is the opinion of the evaluator that action has been taken based on the results of this monitoring oversight and evaluation reports where possible within the project objectives.

4.2.3. Stakeholder participation (R - Satisfactory)

670 This section on stakeholder participation during project implementation includes consideration of information dissemination, participation by local resource users and NGOs, the development of partnerships and collaborative relationships and the involvement of governmental institutions.

- (i) The production and dissemination of information generated by the project. (Rating: 3.7 – marginally satisfactory). Although the effort to collate and disseminate the results of the project could have been greater these also had to be seen within the context of exaggerated expectations from a fledgling market. Documented outputs from the project are not readily available other than on request from the former project management unit or consultants undertaking portions of the programme. The success of the information dissemination drive undertaken by the project must also be seen in the light of the limited ability of a developing market to absorb the outputs. Evidence exists of mechanisms for information dissemination being put in place.

680

- (ii) Local resource users and NGOs participation in project implementation and decision making and an analysis of the strengths and weaknesses of the approach adopted by the project in this arena (4.5 – satisfactory). Attempts to encourage stakeholder participation were thorough. Probably the most notable non-governmental organisation involved was through attempts to create a solar water heating industry association. These are notoriously difficult and unstable entities particularly in the 'pioneer' market situation. A small number of long-standing incumbents often view subsidy based approaches as market distortion and with scepticism often borne out in destructive and protectionist responses to the creation of such associations. The first attempt branded as SolaSure was one such example, encumbered by infighting. The newly formed Solar Water Heating Division of the SESSA appears to be on a more sound constitutional footing and is serving the role of industry liaison on the recently launched utility led solar water heating incentive programme.

690

- (iii) The establishment of partnerships and collaborative relationships developed by the project with local, national and international entities and the effects they have had on project implementation. The numerical assessment for this element was 4.3 (marginally satisfactory to satisfactory).

700

- (iv) Involvement of governmental institutions in project implementation, the extent of governmental support of the project. This aspect demonstrated sound performance amongst the stakeholder participation elements with an assessment of satisfactory 4.6.

Generally attempts to encourage stakeholder participation were thorough.

4.2.4. Financial Planning

Including an assessment of:

- (i) The actual project cost by objectives, outputs, activities

710 Up to date project financial information was provided to the evaluator by the project manager at the time of terminal project termination. At the time USD0.75m had been disbursed representing a disbursement ratio of 100.0%. The total project expenses are summarised as follows:

UNDP	\$0.75m
CEF co-finance	\$0.24m
Total	\$0.99m

- (ii) The cost-effectiveness of achievements

The intended unit emissions reduction abatement cost was estimated to be approximately USD 90/tCO₂e. Using the subsidy contribution to this reduction only (approximately R5000 per system), the unit abatement costs over a 7 year crediting period were approximately USD 50/tCO₂e.

- (iii) Financial management (including disbursement issues)

720 At the time of writing the full project budget has now been allocated and has been disbursed. The evaluation team studied the project financial record "SWH Budget.xls" workbook received 11 Jul 2008. Financial management of the project was sound. The financial audit will be conducted following the final minor disbursements including the final evaluation cost.

- (iv) Co-financing

Co-financing of USD 0.24 million was forthcoming through the Central Energy Fund.

4.2.5. Sustainability

730 It is difficult to outline the extent to which quantifiable benefits of the project are expected to continue, within or outside the project domain, after it has come to an end. Relevant factors include for example: development of a sustainability strategy, establishment of financial and economic instruments and mechanisms and mainstreaming project objectives into the economy. At the time of this evaluation CEF is currently developing a strategy to commercialize SWH by trying to reduce the capital cost and considering different funding mechanisms to aid the industry.

740 Considerable store is placed in the transition of achievement of project objective to the national utility solar water heating programme of significant proportions. The programme aims to achieve a doubling of Solar Water Heating systems installed annually every year for the next 5 years. This would result in approximately 1 million systems being installed cumulatively by 2013. The SWHs for urban housing project is central to this initiative particularly in terms of standardised and tested products being the only one to qualify for a consumer incentive between 20 and 30% of the capital cost of the system. It remains to be seen whether the 1 million system project costing between R2Billion and R4Billion will achieve these objectives.

4.2.6. Execution and implementation modalities.

750 This section considered the effectiveness of the UNDP counterpart and Project Co-ordination Unit's participation in selection, recruitment, assignment of experts, consultants and national counterpart staff members and in the definition of tasks and responsibilities; quantity, quality and timeliness of inputs for the project with respect to execution responsibilities, enactment of necessary legislation and budgetary provisions and the extent to which these may have affected implementation and sustainability of the Project; quality and timeliness of inputs by UNDP and other parties responsible for providing inputs to the project, and the extent to which this may have affected the smooth implementation of the project.

Final evaluation: UNDP/GEF Solar Water Heaters (SWHs) for Urban Housing in South Africa

Consideration of these elements led primarily to emphasis of the improvements in timeliness of inputs, financial and otherwise.

4.3. Results

4.3.1. Attainment of Outcomes/ Achievement of objectives (R - Satisfactory)

This aspect of the evaluation including a description and rating of the extent to which the project's objectives (environmental and developmental) were achieved using the GEF monitoring and evaluation rating system.

760 The objectives of the project are stated in section 1.1. In terms of the attainment of project objectives, both environmental and developmental, the project was considered to be a success.

4.3.1.1. Environmental objectives

The environmental objective of the project is a contribution to climate stabilisation by reducing CO₂ emissions measured in Mt CO₂e per annum.

770 The project had two main objectives, one environmental and the other developmental. Environmentally the project contributed to the stabilisation of global climate by reducing greenhouse gas emissions by approximately 1.2 kt CO₂e annually by 2008. The market impetus created may see these numbers elevate nationally to savings from as many as 1 million anticipated systems in the national utility-led programme over the next 5 years (to 2013), equivalent to the mitigation of 2.3 Mt CO₂e annually.

4.3.1.2. Developmental objectives

From the associated developmental perspective the project sought improved the quality, accessibility and affordability of solar water heaters and increasing job prospects within the South African SWH industry. The end result of the project was to be a higher uptake of this technology from the middle-income residential sector.

It was the intention that these should be verifiably measurable by considering the following indicators:

- 780
- Retail price development of SWHs over time
 - Number of SWHs installed in middle-income areas
 - Number of SWHs installed in low-income areas
 - Number of jobs created

In terms of measurable project indicators the following assessment summary can, therefore, be presented:

Indicator	Target	Achieved
Retail price development	R3750/m ² for glazed SWH – free market information available	Market information not collated to date. External factors on input costs indicate a real increase in the order of 20%
SWH installed	500	500
Number of jobs created	None set	75 ± 25 directly attributable.

Table 7 Indicators of achievement of project objectives

790 The detailed tracking of indicators up to September 2007 for project objectives and outcomes is presented below.

Final evaluation: UNDP/GEF Solar Water Heaters (SWHs) for Urban Housing in South Africa

Project Objective and Outcomes	Description of Indicator⁵	Baseline Level⁶	Target Level⁴	Level⁴ at closure
<p>Objective: Environmental objective: Achieve climate stabilization by reducing CO2 emissions</p> <p>Development Objective: Improve the quality, accessibility, affordability and job prospects of SWHs in South Africa and transform the market from the middle-income sector</p>	1. Quantified CO ₂ e emission reductions	Published Eskom grid mix CO ₂ e levels (2006) of 0.98kg/kWh ⁷ used.	Emissions reductions from 500 systems	500 systems installed. 1.2kt CO ₂ e annually
	2. Retail price development of SWHs over time The Eskom SWH 50 project received prices from 10 suppliers which covered 11 systems from 80Lt to 500Lt capacity – results indicate – Low R42 / Lt (120 Lt) High R80 / Lt (180 Lt) Average R55 / Lt	R 3736.00 per m ² - Glazed SWH	A price reduction of 5%, inflation adjusted Target for 2009 20% reduction, inflation adjusted	Market information not collated to date
	3. Number of SWHs installed in middle-income areas	Total Installed capacity for RSA, glazed SWH is 250 000 m ² Majority installed in middle and high income areas		500 as part of the Project, taken further by ESKOM in an initiative to install a further 1 million systems
	4. Number of SWHs installed in low-income areas	Total Installed capacity for RSA, glazed SWH is 250 000 m ² Majority installed in middle and high income areas	To be estimated, only glazed, divide low and med income, and convert to KWH	0, It was decided on to provide to middle and high income, as a parallel initiative is dealing with low income
	5. Jobs creation	Number of jobs created in the industry	In 2002, 300 people were employed in the Industry	< 1000 jobs extrapolated from AGAMA study – 8733 jobs to be created by 2020.

⁵ This should describe the quantitative indicator

⁶ This should be a quantitative numerical value

⁷ UNFCCC ACM0002 indicates 1.35 kg CO₂e /kWh but not yet firmly established

Final evaluation: UNDP/GEF Solar Water Heaters (SWHs) for Urban Housing in South Africa

Project Objective and Outcomes	Description of Indicator⁵	Baseline Level⁶	Target Level⁴	Level⁴ at closure
Outcome 1: Institutional and project management setup	6. PMU, AC, project staff, workplan, budget, subcontracts	0	N/A	UNDP and PMU continue coordination and communication of the project. Meeting minutes and schedules are available.
Outcome 2: Improve & consolidate standardizing, testing, quality management and customer care procedures for SWH producers, installers & maintainers	7. Improvements on SABS testing equipment (rig),	No test rig available in Africa	Test rig available and functioning	Test Rig fully functional with all improvements made for testing.
	8. Number of tests performed per month	0	3 per month	18 SABS reports submitted from January 2006.
	9. Number of supplier products certified by SESSA or similar institution	0	40% of current products will be certified with a soft "SESSA" certification 2009 target: 75%	15 Systems have been tested, with a further 28 systems waiting to be tested.
	10. Number of complaints and customer feedback handled	N/A	N/A	About 700 calls through the call centre.
Outcome 3: To increase SWH awareness and competencies among retailers, installers and maintainers	11. Number of SWH retailers/installers/maintainers informed & certified	0	40% Target 2009: 75%	52 Installers Certified / trained by Tshwane North College.
	12. Number of articles published in relevant industry magazines such as plumbing, electrician, building publications.	0	15 articles	Over 20
Outcome 4: To increase understanding of the national SWH market and delineate instruments for market transformation	13. Number of people interviewed through the market survey	0	500	Baseline Market Survey Report available with interviews of supply /manufacturers. Most customers will be interviewed at installation and at end of project

Final evaluation: UNDP/GEF Solar Water Heaters (SWHs) for Urban Housing in South Africa

Project Objective and Outcomes	Description of Indicator⁵	Baseline Level⁶	Target Level⁴	Level⁴ at closure
	14. Number of dedicated financial products available in the market.	0	2 Target 2009: 5 products	Finance report available, insurance report available, commercial bank loans available, baseline market survey available, specific subsidy schemes set in place and municipal utility model e.g. the City of Cape Town Bylaw
Outcome 5: To ensure SWH awareness and demonstration through a subsidy and financing scheme	15. Number of systems installed, maintained and monitored	0	500	500 installed, monitoring until August 2008
	16. Number of spin-off campaigns and projects created	0	4	ESKOM50 initiative and Cape Town By-Law initiative initiated and although not yet concluded broadly cited as opportunity for local government intervention., ICLEI Cape Town Regular Database update and Communication with Manufacturers and suppliers. SEA project for the launch of Implementing agents in 3 metropol. Number of businesses involved, increased from 13 to 30 this year. At the time of writing this number has grown to 50 DBSA initiative on REMT commercial SWH programme. Eskom is rolling out a R2 billion SWH Programme which began in September 2007. Suggestion has been to the NERSA that this will be extended to R4Bn.

Final evaluation: UNDP/GEF Solar Water Heaters (SWHs) for Urban Housing in South Africa

Project Objective and Outcomes	Description of Indicator⁵	Baseline Level⁶	Target Level⁴	Level⁴ at closure
Outcome 6: To ensure project replicability and follow-up	17. Written commitment from stakeholders to plan and finance phase 2	0	1	Eskom is rolling out a R2 billion SWH Programme which began in September 2007.

It is therefore the conclusion of this evaluation that, based on the project indicators developed, the project was successful in achieving its goals.

5. Recommendations

- 800 Corrective actions for the design, implementation, monitoring and evaluation of the project include
- Symptoms of so called 'pioneer' markets must be recognized and addressed in the creation and/or support of industry bodies.
 - Public education and awareness creation is demanding and expectations require careful management
 - Monitoring and evaluation must be put in place early in the project and continue throughout to the terminal evaluation
 - Transitions between staff changes need to be seamless with improved focus on knowledge management and effective archiving of information
 - A repository for final document outputs must be created and accessible beyond closure of the project.
 - Improved ongoing M&E potentially through independent assignment thereof and earlier contracting and inclusion of evaluator for the final evaluation in project tracking activities.
- 810

Actions to follow up or reinforce initial benefits from the project

- Availability of the final outputs is important and that the written products have an institutional home. The code of practice for example became part of the SANS 1307 standard. The market survey is on the CEF website.
 - Ongoing certification of the installers, the installation of the test rig for standardisation of the product (still high cost and bureaucratic backlog) and the awareness of SWH (Eskom initiative and supply capacity constraints has created significant interest.)
 - Establishment of an institute to continue training of installers should be considered.
 - Sustainability of the industry association is paramount for continued quality assessment and assurance in the industry. This is particularly important in the environment of explosive growth expected as part of the utility demand side management initiative.
- 820

Proposals for future directions underlining main objectives

- The creation of conditions for organic market growth is valuable in attaining sustained uptake of renewable energy technologies. These include a standardised quality and product testing regime, a widened distribution and maintenance infrastructure and increasing and continued public awareness.
 - These in turn lead to increased job prospects within the South African SWH industry.
 - The rate at which awareness is created must be carefully considered at the outset. The existing capacity of the industry and its ability to increase this capacity within favourable conditions dictates how broadly awareness creation can take place without placing undue stress on the industry by inundating it with demand which it cannot meet. Creating expectations which cannot be met must be avoided. For industry growth to be sustainable growth it needs to be managed at a prudent rate. Processes must be in place to ensure that new market entrants adhere to quality standards.
- 830

6. Lessons learned

840

This section highlights the best and worst practices in addressing issues relating to relevance, performance and success.

One of the clear successes of the solar water heaters for urban housing project is clearly the creation of a standardised product range and a facility for testing of products.

7. Evaluation report Annexes

7.1. Evaluation Terms of Reference

Project Final Evaluation

Terms of Reference

UNDP/GEF Project
“Solar Water Heating Project”

I. Purpose of Terminal Evaluations in the GEF

1. The GEF Instrument requires the GEF to ensure that its programs and projects are monitored and evaluated regularly¹. The GEF Council approved ‘The GEF Policy of Monitoring and Evaluation’ in February 2006. The policy states that through monitoring and evaluation the GEF aims to “promote accountability for achievement of GEF objectives through the assessment of results, effectiveness, processes, and performance of the partners involved in GEF activities.” It further states that “GEF results will be monitored and evaluated for their contribution to global environmental benefits.” The policy enunciates that the GEF partners, in addition to conducting various other evaluations, also evaluate projects “at the end of the intervention (terminal evaluation)².”

2. This document presents guidelines for conducting terminal evaluation (TE) of the GEF supported projects. These guidelines precede any other guidance on TE issued by the EO and are complementary to the individual specific requirements of Implementing and Executing Agencies. Thus, while conducting TE of the GEF supported projects, in addition to applying the GEF guidelines Implementing and Executing Agencies would continue to apply their own evaluation norms and standards.

Introduction:

The Monitoring and Evaluation Policy (M&E Policy) at the project level in UNDP/GEF has four objectives:

a) to monitor and evaluate results and impacts; b) to provide a basis for decision making on necessary amendments and improvements; c) to promote accountability for resource use; d) to document, provide feedback on, and disseminate lessons learned. A mix of tools is used to ensure effective Project monitoring and evaluation. These might be applied continuously throughout the lifetime of the project e.g. periodic monitoring of indicators – or as specific time-bound exercise such as mid-term reviews, audit reports and final evaluations.

In accordance with UNDP/GEF Monitoring and Evaluation policies and procedures, all regular and medium-sized projects supported by the GEF should undergo a final

¹ See: ‘Instrument for the Establishment of the Restructured Global Environment Facility’ (May, 2004); available at: http://thegef.org/GEF_Instrument3.pdf

² See paragraph 13, page 4, of ‘The GEF Monitoring and Evaluation Policy’ (February, 2006); available at: http://thegef.org/MonitoringandEvaluation/MIEAbout/documents/Policies_and_Guidelines-me_policy-english.pdf.

7.2. List of persons interviewed or completing questionnaires

Mr. Helmut Hertzog	7 April 2008
Mr. Tertius Lindenberg	8 April 2008
Mr. Horst Reiche	9 April 2008
Ms. Xolilie Mtwla	10 April 2008
Mr. Andrew Etzinger	11 April 2008
Dr. Steve Lennon	11 April 2008
Mr. Cedric Worthmann	11 April 2008
Ms. Carmen Armstrong	14 April 2008
Mr. Mandla Tsikata	21 April 2008

Not completed

Mr. Jon Adams	21 April 2008
Mr. Graham Mundy	21 April 2008
Mr. Cornelis van Hoewe	17 April 2008
Prof. Dieter Holm	21 April 2008
Mr. Velaphi Msimang	21 April 2008
Mr. Jim Hickey	21 April 2008

7.3. List of documents reviewed

Reference Number	Document	Key elements
1.	UNDP project document (Dec 2003)	Original project document and project logical framework matrix. p58
2.	PIR (Sep 2007)	Project information report for September 2007
3.		
4.		
5.		
6.		
7.		
8.		

7.3.1. Set of documents received on 26 Feb 08

The screenshot shows a Windows Explorer window with a folder named 'SWH 500' selected. The folder contains several subfolders and files. A 'SWH 500 Properties' dialog box is open, displaying details about the folder.

Name	Size
UNDP Contract.pdf	2 360 KB
UNDP Project document.pdf	3 492 KB
2003-07-13 Ministerial Directive - solar water heaters.pdf	343 KB
PIR 17 09 2007_nm.doc	268 KB
PIR- Solar water heaters 2006.pdf	181 KB
SWH500 Project PlanEvalFeb08.mpp	448 KB

SWH 500 Properties

General | Sharing | Customize

Folder: SWH 500

Type: File Folder

Location: F:\NanoEnergyMar08\Projects\SWH500FinalEvaluat

Size: 2.08 GB (2 234 916 829 bytes)

Size on disk: 2.08 GB (2 238 050 304 bytes)

Contains: 1 587 Files, 240 Folders

Created: 17 March 2008, 10:01:20

Attributes: Read-only Hidden

Buttons: OK, Cancel, Apply, Advanced...

7.4. Questionnaire used and summary of results

7.4.1. Questionnaire

UNDP/GEF Solar Water Heaters for Urban Housing in South Africa

Final evaluation questionnaire

The purpose of the UNDP/GEF funded Solar Water Heaters (SWHs) for Urban Housing project was stated in broad terms as:

'transforming the market for SWH in South Africa through barrier removal and creating a susceptible [SWH] market environment in South Africa'.

The project oversaw the installation of 500 incentivised Solar Water Heaters (SWHs) in middle to higher income urban households and standardised the national SWH quality and testing regime. In addition, the project seeks to consolidate a widened distribution and maintenance infrastructure, offer attractive financing options and ensure continued public awareness and involvement on both the supply and the demand-side.

The project had two main objectives, one environmental and the other developmental. Environmentally the project contributed to the stabilisation of global climate by reducing greenhouse gas emissions by approximately 1.2 kt CO₂e annually by 2008. The market impetus created may see these numbers elevate nationally to savings from as many as 1 million anticipated systems in the national utility-led programme over the next 5 years (to 2013), equivalent to the mitigation of 2.3 Mt CO₂e annually. From the associated developmental perspective the project sought improved the quality, accessibility and affordability of solar water heaters and increasing job prospects within the South African SWH industry. The end result of the project was to be a higher uptake of this technology from the middle-income residential sector.

The purpose of this evaluation is to assess the project's progress towards its objectives and goals as contained in the original UNDP/GEF project document and log-frame and any modification as approved during periodic review. The evaluation intends to determine a rating of the extent to which the project's objectives (environmental and developmental) were achieved and to seek stakeholder input to these in validation of the general findings.

In assessing the project experiences, numerous positive, general conclusions may be drawn that will assist any further solar water heater dissemination efforts, in other countries and contexts. The review will assess the activities carried out over the period during which GEF/UNDP support was received for the project.

This evaluation has been commissioned by the Project Management Unit, on request of the GEF focal point, and in compliance with statutory requirements to evaluate all medium-sized GEF funded projects on their completion. Given the pioneering nature of the project, the reviewers will endeavour to assess progress based not only on the originally proposed strategy, but also on the project's response to emerging realities. It is the intention of the evaluators that as many of the project's primary stakeholders as possible be involved in the evaluation.

This questionnaire, therefore, seeks to gather input to the UNDP/GEF component of the Urban SWH project's final evaluation from participants and stakeholders. It includes a description and rating of the extent to which the project's objectives (environmental and developmental) were achieved using Highly Satisfactory, Satisfactory, Marginally Satisfactory, and Unsatisfactory ratings. The broad structure of the questionnaire is:

- Project design
 1. Conceptualisation
 2. Stakeholder participation
- Project implementation
 3. Implementation approach
 4. Monitoring and evaluation
 5. Stakeholder participation
- Project results
 6. Achievement of objectives
 7. Sustainability of these outcomes



1. Conceptualization/Design

This assesses the approach used in design and an appreciation of the appropriateness of problem conceptualization and whether the selected intervention strategy addressed the root causes and principal threats in the project area. It includes an assessment of whether the different project components and activities proposed to achieve the objectives were appropriate, viable and responded to contextual institutional, legal and regulatory settings of the project.

Highly Satisfactory	Satisfactory	Marginally Satisfactory	Unsatisfactory

2. Stakeholder participation

2.1. Dissemination of information

Highly Satisfactory	Satisfactory	Marginally Satisfactory	Unsatisfactory

2.2. Consultation

Highly Satisfactory	Satisfactory	Marginally Satisfactory	Unsatisfactory

2.3. Stakeholder participation in design stages

Highly Satisfactory	Satisfactory	Marginally Satisfactory	Unsatisfactory

3. Implementation approach

3.1. Use of logical framework

Highly Satisfactory	Satisfactory	Marginally Satisfactory	Unsatisfactory

3.2. Adaptive management

Highly Satisfactory	Satisfactory	Marginally Satisfactory	Unsatisfactory



3.3. Electronic information technology use

3.3.1. In implementation

Highly Satisfactory	Satisfactory	Marginally Satisfactory	Unsatisfactory

3.3.2. In stakeholder participation

Highly Satisfactory	Satisfactory	Marginally Satisfactory	Unsatisfactory

3.3.3. In monitoring activities

Highly Satisfactory	Satisfactory	Marginally Satisfactory	Unsatisfactory

3.4. Institutional operational relationships

Highly Satisfactory	Satisfactory	Marginally Satisfactory	Unsatisfactory

3.5. Technical capacities

The role of the project management unit in project development, management and achievements:

Highly Satisfactory	Satisfactory	Marginally Satisfactory	Unsatisfactory

4. Monitoring and evaluation

Including an assessment as to whether there has been adequate periodic oversight of activities during implementation to establish the extent to which inputs, work schedules, other required actions and outputs are proceeding according to plan; whether formal evaluations have been held and whether action has been taken on the results of this monitoring oversight and evaluation reports.

Highly Satisfactory	Satisfactory	Marginally Satisfactory	Unsatisfactory

5. Stakeholder participation

5.1. Production and dissemination of information generated by the project

Highly Satisfactory	Satisfactory	Marginally Satisfactory	Unsatisfactory

5.2. Local resource users and NGO participation

What were the strengths and weaknesses of the chosen approach?

Highly Satisfactory	Satisfactory	Marginally Satisfactory	Unsatisfactory

5.3. Partnerships and collaborative relationships required by the project

Highly Satisfactory	Satisfactory	Marginally Satisfactory	Unsatisfactory

5.4. Government institutional involvement

Highly Satisfactory	Satisfactory	Marginally Satisfactory	Unsatisfactory

6. Achievement of objectives

This question aids in the description and rating of the extent to which the project's environmental and development objectives were achieved.

The overall objective of the project was to "create a susceptible solar water heating market in South Africa"

Broadly the purpose of the project was to:

- Identify and install between 250 and 500 solar water heaters in domestic dwellings
- Introduce relevant standards and standard testing, in consultation with the industry and SABS
- Provide relevant codes of practice and information for installers and maintainers
- Provide training for installers and maintainers
- Promote awareness in the supply and demand side of Solar Water Heaters
- Prepare a business case for future solar water heater projects
- Enhance local planning for future projects
- Suggest financial instruments to enable solar water heater programmes
- Monitor and evaluate the project for replicability.

The environmental objective of the quantity of greenhouse gas emissions avoided is in its turn a function of the number of solar water heaters disseminated and in regular use.

Highly Satisfactory	Satisfactory	Marginally Satisfactory	Unsatisfactory

7. Sustainability

This evaluation indicator measures the extent to which the benefits of the project will continue, within or outside the project domain, after it has come to an end. Relevant factors include for example: development of a sustainability strategy, establishment of financial and economic instruments and mechanisms, mainstreaming project objectives into the economy or community production activities.

Highly Satisfactory	Satisfactory	Marginally Satisfactory	Unsatisfactory

What do you think will happen now?

7.4.2. Summary of results

Respondent				Results	Responses
Date Interviewed					
Element Number	Element rated				
1	Conceptualisation	4.6	4.8	4.8	8
2.1	Dissemination of information		4.4	4.4	7
2.2	Consultation		4.2	4.2	6
2.3	Stakeholder participation in design stages		4.4	4.6	6
3.1	Use of logical framework	4.2	3.8	2.6	7
3.2	Adaptive management			3.7	7
3.3.1	Electronic information use in implementation			3.9	6
3.3.2	Electronic information use in stakeholder participation			4.3	6
3.3.3	Electronic information use in monitoring activities			4.0	5
3.4	Institutional operational relationships			4.5	8
3.5	Technical capacities			4.0	8
4	Monitoring and evaluation			4.4	4.4
5.1	Production and dissemination of information generated by the project	4.2	4.3	3.7	7
5.2	Local resource users and NGO participation			4.5	6
5.3	Partnerships and collaborative relationships required by the project			4.3	7
5.4	Government institutional involvement			4.6	7
6	Achievement of objectives	4.5	4.4	4.6	7
7	Sustainability			4.4	4.4

Table 8 Summary of rated evaluation elements

7.5. UNDP Project Document

8. Presentation of findings to project closure event 4Jun08

[Key findings and conclusions]



- Developmentally:
 - Standardised SWH quality and testing regime. Widened distribution and maintenance infrastructure, continued public awareness.
 - Increased job prospects within the South African SWH industry.
 - Results validated by stakeholder survey
 - Increased uptake of SWH by the middle-income residential sector
 - Eskom incentive programme
 - General increased awareness also given the need for alleviation of the current national electricity supply capacity shortage.
- Environmentally:
 - 500 systems installed.
 - ~2.3 MWh per annum per system achieved (Eskom DSM 50 pilot)
 - 1.14 ktCO₂e annually or 8 ktCO₂e (7 year crediting period)
 - Unit abatement (total project) cost of these reductions USD tCO₂e).



Lessons and Recommendations



- One of the clear successes of the solar water heaters for urban housing project is clearly the creation of a standardised product range and a facility for testing of products.
- Pioneer market symptoms:
 - fledgling industry lacking structure, work intensive - create or support an industry body. Challenging but worthwhile
- Public education and awareness creation is demanding and expectations require careful management
- M&E needs to be put in place earlier
- Transitions between staff turnover need to be seamless with focus on knowledge management and archiving
- Repository for final documents accessible



Notes