



Global Environment Facility

1818 H Street, NW
Washington, DC 20433 USA
Tel: 202.473-0508
Fax: 202.522.3240/3245
Internet: www.theGEF.org

June 7, 2007

Dear Council Member,

The World Bank, as the Implementing Agency for the project, ***South Africa: Renewable Energy Market Transformation (REMT)***, has submitted the attached proposed project document for CEO endorsement prior to final approval of the project document in accordance with the World Bank procedures.

The Secretariat has reviewed the project document. It is consistent with the proposal approved by the Council in April 2005, and the proposed project remains consistent with the Instrument and GEF policies and procedures. The attached explanation prepared by the World Bank satisfactorily details how Council's comments and those of the STAP have been addressed. I am, therefore, endorsing the project document.

We have today posted the proposed project document on the GEF website at www.theGEF.org. If you do not have access to the Web, you may request the local field office of the World Bank or UNDP to download the document for you. Alternatively, you may request a copy of the document from the Secretariat. If you make such a request, please confirm for us your current mailing address.

Sincerely,

A handwritten signature in cursive script that reads "P. G. Bliss-Jacot".

for Monique Barbut
Chief Executive Officer and Chairperson

cc: Alternates, Implementing Agencies, STAP



REQUEST FOR CEO ENDORSEMENT

GEFSEC PROJECT ID: 1894
IA/ExA PROJECT ID: P073322
COUNTRY: South Africa
PROJECT TITLE: Renewable Energy Market Transformation
GEF IA/ExA: World Bank
OTHER PROJECT EXECUTING AGENCY(IES):

DURATION: 4 Years
GEF FOCAL AREA: Climate Change
GEF STRATEGIC OBJECTIVES: CC-4
GEF OPERATIONAL PROGRAM: OP 6
COUNCIL APPROVAL DATE: April 2005
COUNCIL APPROVED AMOUNT*: \$6 MILLION
CEO ENDORSEMENT AMOUNT*: \$6 MILLION
ESTIMATED STARTING DATE: October 2007
EXPECTED AGENCY APPROVAL DATE: July 1, 2007
EXPECTED SUBMISSION DATE OF MID-TERM REPORT: October 2009
EXPECTED GRANT CLOSING DATE: October 2011
EXPECTED SUBMISSION DATE OF TERMINAL EVALUATION/ PROJECT COMPLETION MAY 2012


FINANCING PLAN (\$)		
	PDF	Project*
GEF	A	
	B	
	C	
GEF Total		6,000,000
Co-financing		(provide details in Section d): Co-financing)
GEF IA/ExA		
Government		2,300,000
Private Sector ¹		9,000,000
Co-financing Total		11,300,000
Total		17,300,000
Financing for Associated Activities If Any:		

* For multi-focal area projects, indicate agreed split between focal area allocations

** Projects that are jointly implemented by more than one IA or ExA

FOR JOINT PARTNERSHIP**		
GEF PROJECT/COMPONENT (\$)		
(Agency Name)	(Share)	(Fee)
(Agency Name)	(Share)	(Fee)
(Agency Name)	(Share)	(Fee)

Approved on behalf of the *World Bank*. This proposal has been prepared in accordance with GEF policies and procedures and meets the standards of the GEF Project Review Criteria for CEO endorsement.


 Steve Gorman
 GEF Executive Coordinator, The World Bank
 Date: May 10, 2007

Christophe Crepin
 GEF Regional Coordinator, The World Bank
 Project Contact Person

Tel. and email: 202 473 9727

¹ This amount is “subsequent” co-financing and is being leveraged throughout the project life (ref. to Results Framework and Monitoring in the PAD p.35).

1. **FINANCING** (for all the tables, expand or narrow table items as necessary)

a) PROJECT COST

Project Components/Outcomes	Co-financing (\$)	GEF (\$)	Total (\$)
1. Renewable energy power generation	1,700,000	4,050,000	5,750,000
2. Commercial Solar Water Heating (CSWH) ¹	9,300,000	1,400,000	10,700,000
3. Project Management budget/cost ²	300,000	550,000	850,000
Total Uses of Funds/project costs	11,300,000	6,000,000	17,300,000

Note: 1. This item is the aggregate cost of project management; breakdown of this aggregate amount should be presented in the table b) below:

b) PROJECT MANAGEMENT BUDGET/COST²

Component	Estimated Staff weeks (GEF)	GEF(\$)	Other Sources (\$)	Project Total (\$)
Locally recruited personnel ¹	300	300,000	200,000	500,000
Internationally recruited consultants*	40	100,000		100,000
Office facilities, equipment, vehicles and communications ²		80,000	50,000	130,000
Travel ³		50,000	50,000	100,000
Miscellaneous		20,000		20,000
Total		550,000	300,000	850,000

Note: 1. Local and international consultants in this table are those who are hired for functions related to the management of project. For those consultants who are hired to do a special task, they would be referred to as consultants providing technical assistance. For these consultants, please provide details of their services in c) below.

2. This includes office rental, utilities, office equipment such as computers, copy machines, and papers, as well as communications such as telephone calls and faxes.

3. This includes domestic travel of project management staff to provide supervision during project implementation period.

c) CONSULTANTS WORKING FOR TECHNICAL ASSISTANCE COMPONENTS:

Component	Estimated Staff Weeks (GEF)	GEF(\$)	Other Sources (\$)	Project Total (\$)
Personnel				
Local consultants*	2,280	2,850,000	1,450,000	4,300,000
International consultants*	240	600,000		600,000
Total	2,520	3,450,000	1,450,000	4,900,000

d) CO-FINANCING

Name of Co-financiers (source)	Classification	Type	At Concept (\$)	At Work Program (\$)	At CEO Endorsement (\$)*
Government ¹	Nat'l Govt	Cash and in-kind		2,300,000	2,300,000
Private Sector ²	Private Sector	Cash		9,000,000	9,000,000
Total Co-financing				11,300,000	11,300,000

Note: 1. The government has confirmed counterpart financing of \$2.3 million from the government's Renewable Energy Subsidy Fund, Renewable Energy Directorate budget, and in-kind contribution, over the Project implementation period. Please see Table 3 in the PAD for detailed allocation of the government co-funding to each project activity. This has been recorded in the negotiation minutes.

² For all consultants hired to manage project or provide technical assistance, please attach a description in terms of their staff weeks, roles and functions in the project, and their position titles in the organization, such as project officer, supervisor, assistants or secretaries.

2. This project is expected to leverage \$ 9.0 million from the private sector for investment in CSWH systems. As such, this leveraged fund cannot be committed in the same manner as Government or donor funds. However, unlike in many other countries, South Africa's financial markets have the required motivation and capability to provide funds of this magnitude.

2. RESPONSE TO REVIEWS

a) COUNCIL

To respond to GEF Council's concern over performance indicators given that a large amount of funding is requested for capacity building, the revised PAD shifted some of the capacity building funding to matching grants which directly link to deal-making outputs, and listed measurable indicators such as (i) number of private developers assisted and number of feasibility studies prepared; (ii) number of commercial solar water heaters installed; (iii) fossil fuel-based power generation avoided; (iv) investment in commercial solar water heaters in Section B2 on page 13 and Annex 3 on page 33 of the revised PAD.

b) GEF SECRETARIAT REVIEW SHEET FROM FEB. 17, 2005

The response to GEFSEC's main concern over economic viability of grid-connected renewable power given the low electricity prices is listed in Section A1 on page 9 and Section C4 on page 24 of the revised PAD.

GEF SECRETARIAT Review Sheet from May 4, 2007

Comment from GEFCEO: Study tour is not eligible for GEF funding, so drop the study tour sub-component.

Response: We have reallocated the \$100k on study tour from Activity 1.1 to Activity 2.1 capacity building for government agencies, industries, and financial institutions. Please see Annex 4 for detailed description of revised activity 1.1 and 2.1, and Table 3 in the main text and Annex 5 for revised project cost.

Comment: Project management budget. Please explain what the \$80k is budgeted for under office facilities, equipment, vehicles, and communications; and what the \$70k is for under travel.

Response: The \$80k covers office rental, utilities, office equipment such as computers, copy machines, and paper, as well as communications such as telephone calls and faxes, while the \$50k includes domestic travel of project management staff to provide supervision during project implementation period.

Comment: Co-financing type. The Government co-financing seems to be cash and in-kind -- please specify in the financing plan how much is cash and how much is in-kind (and for what activities). The PS co-financing should be cash

Response: The Co-financing type has been corrected. It is clarified under Table d that the Government contribution of \$2.3 million will come from the government's Renewable Energy Subsidy Fund, Renewable Energy Directorate budget, and in-kind contribution, over the Project implementation period. Of this amount, \$2 million is in cash while the rest is in-kind. Please see page 16 of the GEF Project Document for the detailed cost break-down for the co-funding under each activity.

Comment: For the study tours (mentioned in the negotiation minutes and Activity 1.1 - \$150k), please provide explanation of the budget and justification for the study tours

Response: This has been addressed and elaborated on page 42 in the GEF Project Document. Of the total budget of \$150k for Activity 1.1, \$100k is allocated for study tour, for the reasons described on page 42 of the GEF Project Document.

Comment: Since this is a stand-alone GEF project without Bank financing (and with limited government funding), the section on the Rationale for Bank Involvement needs to be strengthened,

Response: This section has been elaborated and revised on page 9-10 in the GEF Project Document.

C) REVIEW BY EXPERT FROM STAP ROSTER (IF REQUIRED)

3. JUSTIFICATION FOR MAJOR CHANGES IN THE PROJECT, IF ANY³

1. The revised PAD shifted funding allocation among components (See Table 3), because (i) some of the originally proposed activities such as cost-supply curve and resource assessment have been mostly completed under the DANIDA project, therefore, GEF funding allocation for these activities has been reduced; (ii) as the South African government is contemplating to adopt feed-in tariff scheme to promote renewable energy, GEF funding allocation for Component A1 (policy and regulatory framework) has been increased, and activities under Component A1 have been slightly revised with a focus on development and implementation for mandated market policy; and (iii) to respond to GEF Council's comments, GEF funding for capacity building has been reduced and shifted to matching grants, as the matching grants directly link to deal-making outputs such as number of private developers assisted, which will result in increased investment and installed capacity of renewable energy.

2. The revised GEF Project Document separated project development objective from global environmental objective.

3. The PAD revised indicators and results framework, based GEF regional coordinator's comments and discussions with the clients.

4. The GEF Project Document revised sections on sustainability and replicability, stakeholder participation, lessons learned, and M&E, based on GEF regional coordinator's comments and GEFSEC review sheet at work program entry.

5. The GEF Project Document revised implementation arrangement, based on clients' requests, which clearly spelled out roles and responsibilities of the Project Steering Committee, DBSA, and Implementation Support Unit (ISU). Implementation support for Component A and B is now combined to minimize management costs and increase coordination between the two components. On the project management costs, DME and DBSA informed the Bank team that

³ Provide justifications for any major amendments in the project, including an increase of project amount exceeding 5% from the amount approved by the Council. Justification for such amendments and the project document will be circulated to the Council for a four-week review period. For procedures to the approval for major amendments, refer to the Council paper: [Project Cycle Update: Clarification of Policies and Procedures for Project Amendment and Drops/Cancellations. GEF/C.24/Inf.5](#)

they have agreed to give DBSA a 5% management fee specified in their MOU, lower than DBSA's standard charge to manage other agencies' projects. DBSA is responsible for financial management, disbursement, budgeting, accounting, treasury services, and corporate services such as HR management, legal advisory services, etc. In addition, an ISU will be set up with a project manager responsible for implementing the project.

6. The revised GEF Project Document added special procurement arrangement under Annex 8, based on request from clients and recommendations from the Regional Procurement Manager.

7. The total amount of co-financing remains the same as those at the work program entry. Based on recommendations from GEFSEC, the expected investment in commercial solar water heaters from the private sector (\$9 million) is listed as leveraged funds.

4. REQUIRED ATTACHMENTS

- a) Project Appraisal Document
- b) Confirmed letters of commitments from co-financiers (with English translations)
- c) Agency Notification Template on Major Project Amendment and provide details of the amendment, if applicable.

Document of
The World Bank

Report No: 39789-ZA

GEF PROJECT DOCUMENT
ON A
PROPOSED GRANT
FROM THE GLOBAL ENVIRONMENT FACILITY TRUST FUND
IN THE AMOUNT OF US\$6 MILLION EQUIVALENT
TO THE
REPUBLIC OF SOUTH AFRICA
FOR A
RENEWABLE ENERGY MARKET TRANSFORMATION PROJECT

May 31, 2007

Energy Team
Infrastructure Group
Africa Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective – May 31, 2007)

Currency Unit = South African Rand
R7.03 = US\$1
FISCAL YEAR
April 1 – March 31

ABBREVIATIONS AND ACRONYMS

BEE	Black Economic Empowerment
CAG	Controller and Auditor General
CAS	Country Assistance Strategy
CFAA	Country Financial Accountability Assessment
CSWH	Commercial Solar Water Heating
DANIDA	Danish International Development Agency
DBSA	Development Bank of Southern Africa
DFIs	Development Finance Institutions
DME	Department of Minerals and Energy
EFL	Electricity Feed Law
Eskom	State-Owned Electric Power Utility
FMS	Financial Management Specialist
GEF	Global Environment Facility
GHG	Greenhouse Gas
IBRD	International Bank for Reconstruction and Development
IDT	Independent Development Trust
IFAC	International Federation of Accountants
IFR	Interim Financial Report
IPP	Independent Power Producer
ISU	Implementation Support Unit
LFG	Landfill Gas
LPG	Liquefied Petroleum Gas
LRMC	Long Run Marginal Cost
MG	Matching Grant
MoU	Memorandum of Understanding
Mtoe	Million Tons of Oil Equivalent
NERSA	National Energy Regulator of South Africa
NFFO	Non-Fossil Fuel Obligation
PCF	Prototype Carbon Fund
PG	Performance Grant
PPA	Power Purchase Agreement
QCBS	Quality and Cost Based Selection
REMT	Renewable Energy Market Transformation
RFP	Request for Proposal

RPS Renewable Energy Portfolio Standards
SAWEP South Africa Wind Energy Project
SC Steering Committee
SWH Solar Water Heating
TA Technical Assistance
TOR Terms of Reference

Vice President:	Obiageli K. Ezekwesili
Country Manager/Director:	Ritva S. Reinikka
Sector Manager:	S. Vijay Iyer
Task Team Leader:	Xiaodong Wang

**SOUTH AFRICA
RENEWABLE ENERGY MARKET TRANSFORMATION PROJECT**

TABLE OF CONTENTS

A. STRATEGIC CONTEXT AND RATIONALE.....	1
1. Country and Sector Issues.....	1
2. Rationale for Bank Involvement.....	5
3. Higher-Level Objectives to which the Project Contributes	7
B. PROJECT DESCRIPTION	8
1. Lending Instrument.....	8
2. Project Development Objective and Key Indicators.....	8
3. Project components.....	9
4. Lessons Learnt	15
5. Alternative Development Interventions/Approaches.....	16
C. IMPLEMENTATION	17
1. Partnership Arrangements.....	17
2. Institutional and Implementation Arrangements	18
3. Monitoring and Evaluation of Outcomes/Results.....	20
4. Sustainability and Replicability	21
5. Critical Risks and Possible Controversial Aspects	22
6. Loan/Credit Conditions and Covenants	23
D. APPRAISAL SUMMARY	24
1. Economic and Financial Analysis.....	24
2. Technical.....	26
3. Fiduciary	26
4. Social.....	27
5. Environment.....	27
6. Safeguard Policies.....	27
7. Policy Exceptions and Readiness.....	28
Annex 1: Country and Sector or Program Background.....	29
Annex 2: Major Related Projects Financed by the Bank and other Agencies ...	35
Annex 3: Results Framework and Monitoring	41
Annex 4: Detailed Project Description	40
Annex 5: Project Costs.....	54
Annex 6: Implementation Arrangements.....	56

Annex 7: Financial Management and Disbursement Arrangements	61
Annex 8: Procurement Arrangements.....	66
Annex 9: Economic and Financial Analysis	72
Annex 10: Safeguard Policy Issues	79
Annex 11: Project Preparation and Supervision	81
Annex 12: Documents in the Project File.....	82
Annex 13: Statement of Loans and Credits.....	83
Annex 14: Country at a Glance	85
Annex 15: Incremental Cost Analysis	87
Annex 16: STAP Expert Review and Response	101
Annex 17: GEF Secretariat's Comments and IA/ExA Response	109

A. STRATEGIC CONTEXT AND RATIONALE

1. COUNTRY AND SECTOR ISSUES

1.1 **Overall economic conditions.** South Africa's economic performance during the first decade of freedom has been impressive on several counts. Sound macroeconomic policies and strong fiscal discipline contributed to the 3 percent average annual growth during the first decade after 1994. Recent economic performance has also been strong. Real GDP growth reached 4.9 percent in 2005 and 4.6 percent in 2006, employment has risen, and inflation has remained within the target band for over two and a half years. Foreign debt is low and overall borrowing has been brought below 40 percent of GDP. The fiscal deficit fell from 1.5 percent of GDP in FY2004/05 to 0.3 percent in FY2005/06, reflecting buoyant revenues. Owing to large capital inflows, international reserves continued to rise.

1.2 South Africa contributes 40 percent of Sub-Saharan Africa's GDP—its nine largest cities alone account for about 24 percent of Africa's GDP. Growth spillovers to the rest of the continent are exceptionally large by international standards: an additional percentage point of South African growth is associated with 0.5 to 0.75 percent GDP growth increases in the rest of Africa, independent of common regional shocks.

1.3 **Energy and Environmental Issues.** South Africa is one of the few countries in the world that heavily relies on coal to meet its energy needs, with 75% of total energy consumption from coal in 2004. It is the world's sixth largest coal producers, 90% of which was used for electricity generation and the synthetic fuel industry. As a result, South Africa has high greenhouse gas (GHG) emissions, the largest contributor in Africa.

1.4 **Power sector.** South Africa has a well-developed power sector, with a total installed capacity of 42 GW and a total electricity production of 244,607 GWh in 2004, which is predominantly coal-fired (92%), and includes nuclear (5%), hydro (2%), as well as solar, biomass, and gas (1%). South Africa accounted for 45% of the total power produced in all of Africa. The generation and transmission of power is concentrated in the hands of Eskom, the vertically integrated state-owned utility. Eskom is also the largest single distributor in the country in terms of energy sales for final consumption and number of customers, although there are more than 400 other distributors, mainly municipal electricity departments that also supply electricity to end customers. While Eskom is widely recognized as a world-class power utility (electricity prices in South Africa are among the lowest in the world, with an average sales price of around 2 U.S. cents per kWh), the Cabinet approved in June 1999 a plan to merge the large number of municipal distributors and Eskom's distribution businesses into six Regional Distribution Companies (REDs). However, implementation of the Cabinet's decision has been painfully slow

and convoluted. The first RED was established only in 2005 and only on paper. Other changes to the generation and transmission sectors will be made in due course.

1.5 South Africa is currently experiencing power shortages and load shedding, as generation capacity has not increased over the past ten years, despite a steady growth in demand for electricity. Increasing power shortages in South Africa could pose a serious threat to sustained economic growth and international competitiveness. ESKOM is currently planning to build 1,500 MW of power capacity each year over the next five years to meet the growing demand.

1.6 **Project background.** This project has been formulated after several years of dialogues and discussions between World Bank and the Government of South Africa. In early 2000, the Minister of Energy (who is now South Africa's vice president) requested Bank assistance on two fronts: (i) utilizing renewable energy resources, and (ii) stimulating productive uses of electricity in the rural areas, where electricity had been successfully provided by Eskom under a subsidized program (which, however, had not led to income-generating activities). The Bank took the following measures in response:

- (a) helped organize a People's Power workshop in South Africa in 2000;
- (b) helped draft the Government's *White Paper on Renewable Energy*, which was approved in 2003;
- (c) helped define a program to stimulate the productive uses of electricity in rural areas, in partnership with the Independent Development Trust (IDT) and a variety of stakeholders;
- (d) held extensive discussions with the Department of Housing about Bank assistance for an efficient-energy housing program, which did not proceed beyond the draft stage;
- (e) helped the government understand the practical opportunities open to South Africa under the Kyoto Protocol;
- (f) assisted the government with advice and expertise on a number of energy-related issues, such as ambient air pollution in townships like Soweto and removal of lead from gasoline.

1.7 This proposed Renewable Energy Market Transformation (REMT) project is a result of this dialogue, and aims to help the government implement the *White Paper on Renewable Energy*. The project concept has been vetted by South Africa's National Treasury, which has formally requested the Bank to prepare this project using GEF grant support.

1.8 **Development of renewable energy.** The government has committed South Africa to reducing the country's GHG emissions. The government's *White Paper on Renewable Energy* (2003) sets the following target for renewable energy:

10,000 GWh (0.8 Mtoe) renewable energy contribution to final energy consumption by 2013, to be produced mainly from biomass, wind, solar and small-scale hydro. This is approximately 4 percent (1,667 MW) of the estimated electricity demand by 2013 (41,539).

The *White Paper* lists these sources for meeting the target:

The renewable energy is to be utilized for power generation and non-electric technologies such as solar water heating and bio-fuels.

1.9 The government currently plans to adopt a mandatory feed-in tariff and a voluntary green electricity trading scheme to promote renewable energy development to achieve this target. In addition, given the high demand for solar water heaters, Eskom recently plans an aggressive solar water heater program to mitigate the power shortage. Solar water heaters have a large replication potential to reduce greenhouse gases by replacing fossil fuel combustion. Furthermore, the power tariff for newly built power plants has increased to 3.6–4.3 U.S. cents/kWh, according to the National Energy Regulator of South Africa (NERSA). With additional revenue streams from carbon financing, some renewable energy technologies can be financially viable at this tariff level.

1.10 Given South Africa's strong industrial and financial sectors, and the high overall level of capacity, the 10,000 GWh target may appear to be easy to achieve. To the contrary, this is an ambitious target for South Africa, because it has significant barriers to renewable energy development. In principle, South Africa could eliminate these barriers on its own; however, long years of being cut off from international trends as well as the historical reliance on coal make it very difficult for the country to move forward on renewable energy on its own. Consequently, the government has requested assistance from the World Bank and GEF.

1.11 The main barriers to this project's two sources of renewable energy are described below:

- (a) Renewables-based power generation in South Africa: So far there are few renewable-based power generation in South Africa, though a few renewable energy power generation projects have been developed, with some form of financial assistance from official/bilateral funds or international carbon funds. The main barriers to such generation are as follows: (i) low current power tariff levels (an average tariff of 2.3 U.S. cents/kWh), well below the long-run marginal costs of expansion and costs of most renewable energy technologies in South Africa; (ii) lack of a policy and institutional framework for sale of power into the main grid; (iii) absence of readily available reliable basic information about renewable energy resources, (iv) potential developers' unfamiliarity with details of the government's approach for promoting renewable energy, as well as unfamiliarity with the nature and extent of support for renewable energy, and (v) inadequate capacity and knowledge in official agencies as well as private sector financial institutions that would finance renewable energy investments.
- (b) Solar water heating: A nascent market has emerged in large-scale solar water heaters suitable for commercial establishments such as hotels, hospitals, old age homes, and rural fish farms. No official, bilateral, or international funds are involved in these transactions. The main barriers to scale-up are as follows: (i) lack of recognized industry best practices, standards, and codes; (ii) potential customer's unfamiliarity with the technology; and (iii) potential customers' unease at doing business with suppliers and vendors that are often viewed as lacking adequate stature and backing, given their small scale and recently established status.

1.12 **Assessment of Availability of Commercial Funds for Overall Renewable Energy Development.** An assessment has been made of the interest, awareness, capacity, and experience of South African financial organizations to finance the type of renewable energy investments required to meet the government’s overall renewable energy target of 10,000 GWh per year. This assessment was based on the following:

- Discussions with three of the four largest banking groups in South Africa—Absa, FirstRand, and Standard; the relevant officials of the fourth major bank group, Nedcor, were not available at the time of the assessment mission;
- Discussions with three specialized public sector development finance organizations (DFIs)—the Central Energy Fund, the Development Bank of Southern Africa (DBSA), and the Industrial Finance Corporation;
- Reviews with each of these institutions of their arrangements, expectations, and issues for financing renewable energy investments of the type that would be expected to be supported.

1.13 The main findings of the assessment are as follows:

- **Strong financial sector.** South Africa has a sophisticated, deep, and broad financial sector. The IMF has characterized the sector as sound and well regulated, and as having demonstrated, based on the 2001 experience, that it can handle sharp currency depreciations.
- **Strong interest in financing renewable energy projects.** The six finance organizations surveyed confirmed their interest in renewable energy investments. All are currently getting ready—in terms of organization, staffing, research, and marketing—to finance project investments for energy, including renewable energy. Energy is viewed as the “next big wave” in South Africa and the region by several financial institutions. The three banks have formed special energy units or have energy-specific staff capable of structuring competitive finance services for energy projects, including debt and assistance with equity placements. The three specialized finance organizations have particular interests and capabilities in the energy sector, including renewable energy.
- **Suitable financing packages can be made available.** The maximum debt sizes would not be limiting for renewable energy investments in South Africa, as these investments are relatively small by local standards. Tenure of debt of longer than seven years for the banks or ten years for the DFIs is a potential issue, although the South African financial sector has the capability to structure instruments for dealing with this. It is expected that the financial institutions will carefully scrutinize the quality of the power off-take agreements, particularly for the financial strength of the buyer.
- **Few renewable energy projects in the portfolio.** Renewable energy is a relatively new interest for South Africa’s financial sector. DBSA, for example, regards renewable energy as a potential area to provide debt financing. DBSA has a partnership agreement with the World Bank's Carbon Finance Unit for the identification of potential Clean Development Mechanism (CDM) project that might qualify for carbon finance. To date,

the DBSA has approved debt financing for two renewable energy projects—a 4 MW Bethlehem Hydro project and a 4.2 MW Biotherm landfill-gas-to-energy project—both with carbon financing. DBSA also provided debt financing for the National Pilot Demonstration Darling Wind Farm project in the Western Cape region. The banks and DFIs expect that the renewable energy portfolio will grow, given the demand and the policy of attracting new sources of generation.

2. RATIONALE FOR BANK INVOLVEMENT

2.1 The Bank has received a mandate from the G8 summit at Gleneagles to undertake a Climate Change Initiative in G+5 countries - China, India, Brazil, Mexico and South Africa. Renewable energy is one of the priority areas for the clean energy work program, and the DME has requested Bank assistance to this program. The Clean Energy Investment Framework that was recently endorsed by the Development Committee also highlighted the importance of renewable energy. In this project, the government intends to use the World Bank as a “knowledge bank,” and not as a lending institution, which is consistent with the overall relationship between the government and the Bank in South Africa. Bank involvement in this project will: (1) introduce international best practices and cutting-edge knowledge of renewable energy development, in particular renewable energy policy frameworks; (2) link this project to Bank’s overall power sector policy dialogue and climate change dialogue in South Africa; (3) build local capacities; and (4) leverage public-private financing instruments such as “carbon credit” financing.

2.2 This project is closely coordinated with DANIDA, which supported Department of Minerals and Energy (DME) on renewable energy. The Bank’s comparative advantage is its ability: (i) to provide high-level technical support, such as that already provided in finalizing the government’s *White Paper on Renewable Energy*; and (ii) to mobilize significant amounts of carbon funds for renewable energy development.

Rationale for GEF Funding

2.3 The core rationale for GEF support is to mitigate the barriers facing renewable energy development in South Africa. The key role of GEF in this project is to grant co-finance TA that would jumpstart the move towards the 10,000 GWh target by eliminating the main barriers listed above. GEF will not finance the renewable energy investments itself, as South Africa has the financial capability to raise significant resources both in the domestic and international markets to finance renewable projects.

2.4 Furthermore, the project sets in place a structure that will continue to support renewable energy development beyond the current 10,000 GWh target. This structure consists of a new policy and regulatory framework, and improved institutional capacity in the DME and various stakeholder agencies. Undoubtedly, this structure will need to evolve over time, but this can take place without external support, given South Africa’s generally strong institutions.

2.5 The technical feasibility of achieving this target was considered in a study when this project was prepared, which developed a “cost supply curve” of renewable energy. The study examined specific projects in different sources of renewable energy, such as bagasse

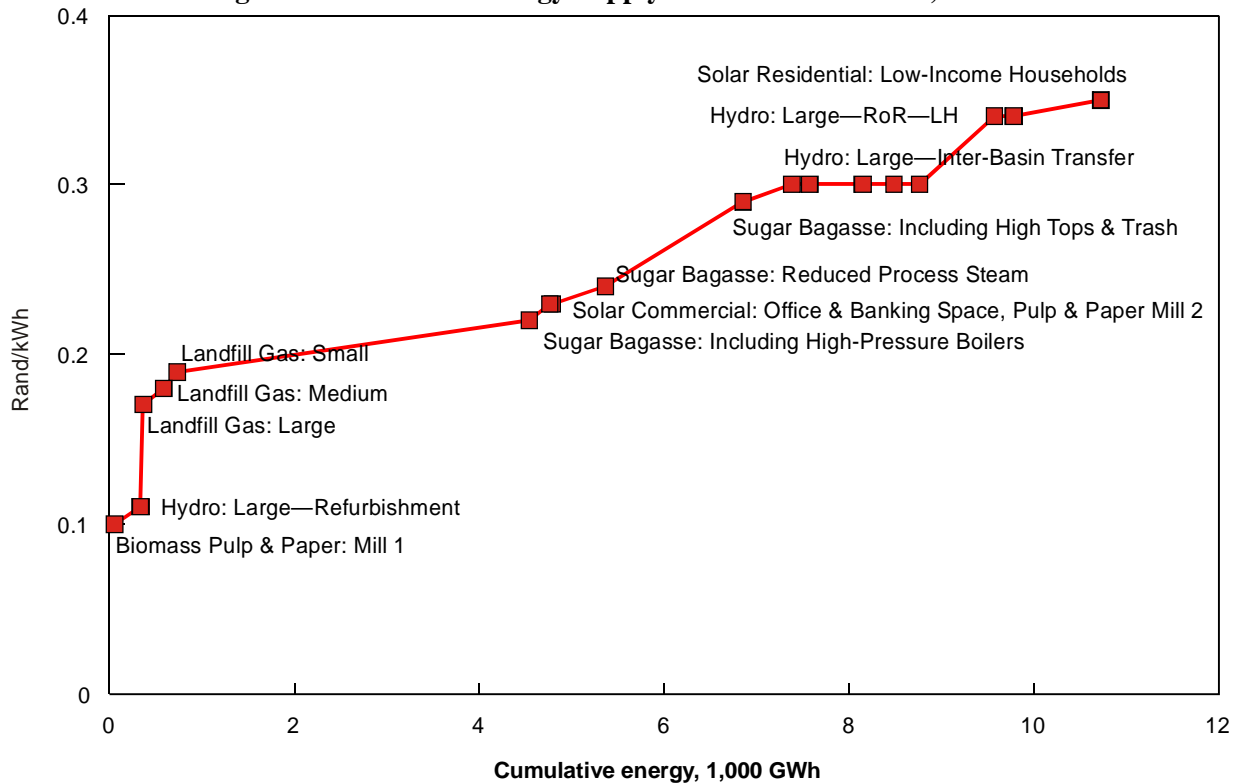
cogeneration, solar water heating, pulp and paper, wind, and small hydro. The supply curve derived in this study is showing below in Figure 1. The estimated least-cost supply for the first 10,000 GWh shows that:

- Wind is not part of the first 10,000 GWh
- All of the landfill gas potential is within the first 10,000 GWh (and occupies a significant portion of the first 1,000 GWh)
- The balance of the 10,000 GWh target is made up of commercial solar water heating, small hydro, pulp & paper, and the sugar industry.

2.6 This supply curve should not be interpreted to mean that all the potential of a particular renewable resource will be fully used up by the GWh attributed to it. For example, the 240 GWh contribution of landfill gas (LFG) is from seven “identified projects” that have been studied in detail, and the additional contribution of 600 GWh is from 57 sites that have been studied in lesser detail. A very conservative approach was adopted for these 57 sites, and it is quite possible that the true potential is twice the estimated amount. A similar conservative approach has been used for the other resources also.

2.7 The detailed contribution of each source towards the 10,000 GWh target is shown in table 1.

Figure 1: Renewable Energy Supply Curve—The First 10,000 GWh



Source: Conningarth Economists, June 2004.

Table 1: Renewable Energy Supply Curve—Sources

Source	Project	First 1,000 GWh	Next 4,000 GWh	Total 10,000 GWh target
Sugar	Sugar mills spare capacity	55	55	55
	Reduced-process steam	109	109	109
	Full-scale cogeneration		551	1,380
Solar Water Heater		175	1,000	3,633
Pulp & Paper	Ngodwana	65	65	65
	Additional projects	20	170	340
Hydro	Identified projects	210	210	210
	Additional projects	75	1,000	3000
Landfill Gas	Identified projects	240	240	240
	Additional projects	51	600	600
Wind		0	0	368
Total		1,000	4,000	10,000

3. HIGHER-LEVEL OBJECTIVES TO WHICH THE PROJECT CONTRIBUTES

3.1 South Africa, being one of the most significant emitters of carbon dioxide (CO₂) in the developing world, considering the size of its economy and its heavy reliance on coal-based energy generation, faces greater challenges than other countries in dealing with climate change.

This project will assist the government in implementing its *White Paper on Renewable Energy*, and meeting the 10,000 GWh target, which will contribute to mitigation of GHG emissions in South Africa. This project is consistent with the proposed 2007 Country Partnership Strategy, focusing on “fostering social and environmental sustainability” in previous 1999 Country Assistance Strategy. It is also coherent to the Bank’s mandate from the G8 Summit at Gleneagles to undertake a Climate Change Initiative in G+5 countries.

B. PROJECT DESCRIPTION

1. LENDING INSTRUMENT

1.1 This project does not involve any Bank lending; it will provide only GEF funds, which will be used for technical assistance. Outside this project, renewable energy investments will be financed by a combination of: (i) private equity and commercial debt; and (ii) carbon funds. Keeping carbon credit financing outside the project will provide full flexibility to all interested buyers to negotiate each renewable energy investment on its own merit.

2. PROJECT DEVELOPMENT OBJECTIVE AND KEY INDICATORS

Project Development Objective

2.1 The project development objective is to establish policy and regulatory frameworks and build institutional capacity for renewable energy development in South Africa. The global environmental objective, in line with GEF Operational Program 6, is to remove the barriers to renewable energy technologies to help mitigate greenhouse gas emissions. The specific strategic priority is CC-4—promote on-grid electricity from renewable sources.

2.2 The principal outcomes of the project will be (i) the establishment of the policy and regulatory frameworks and institutional capacity required for meeting the government’s renewable energy target, and (ii) an established commercial solar water heating (CSWH) industry. In terms of the government’s ultimate objective, the project will significantly increase the likelihood of meeting and going beyond the 10,000 GWh target, towards which there would be little progress in the absence of this project.

Key Indicators

2.3 This project provides TA and capacity building, that is, it will not finance investments, with the exception of limited support for capacity building and demonstrative subprojects of the CSWH industry. Thus, indicators linked to investments, power generation, and CO₂ in renewable energy other than CSWH are outside the scope of the project. However, in order to assist the Government of South Africa in measuring progress towards its overall renewable energy target, it has been decided to monitor some additional indicators that are outside the scope of the project.

Project key indicators

2.4 The project indicators for the renewable energy power generation component are as follows:

- Legal, policy, and regulatory frameworks for grid-based renewable energy power prepared by the government and electricity regulator and submitted for government approval by December 31, 2009
- Database for renewable energy resource is available
- Number of potential developers for renewable energy power generation assisted and number of pre-feasibility studies prepared
- Knowledge about renewable energy increased in relevant official agencies and private sector financial institutions

2.5 The project indicators for the CSWH component are as follows:

- Formulation of industry standards and codes
- Number of commercial solar water heaters installed
- Fossil fuel-based power generation avoided
- Investments in CSWH systems
- CO₂ emissions avoided

2.6 ***Key indicators outside scope of the project***

- Progress in meeting the government's overall 10,000 GWh renewable energy target
- Investments in renewable energy power generation
- Reductions in difference between cost of renewable energy power and Eskom's cost of fossil fuel generation
- Renewable energy power generated, fossil fuel power generation avoided, and CO₂ emissions avoided

3. PROJECT COMPONENTS

3.1 The project has two components (see table 2):

1. Renewables-based power generation in South Africa: Technical assistance (TA) and capacity building will eliminate the barriers identified above.
2. Commercial solar water heating: Focusing only on the commercial segment (which complements a UNDP-GEF project focused on the residential¹ segment), TA and capacity building will address the barriers identified above. In particular, a "participating CSWH company program" will be created that would enhance the

¹ CSWH systems range in storage capacity 5,000 to 50,000 liters, whereas the capacity of residential systems is 200–300 liters. Some of the main end-users of CSWH systems include hotels, hostels, hospitals, fish farms, and flats/apartment blocks.

companies' credibility, as they would agree to observe the conditions of the program (including performance verifications of installed systems) in exchange for some performance-based grants for demonstrative subprojects in the initial stages of the project.

Table 2: Project Components and Financing Plan				
Component	Cost Estimates (US\$ million)	Financing Plan (US\$ million)		
		GEF	Government ¹	Private/Banks ²
Renewable energy power generation	5.75	4.05	1.70	0.00
CSWH*	10.70	1.40	0.30	9.00
Project Management Cost	0.85	0.55	0.30	
Total	17.30	6.00	2.30	9.00
<p>1. The Government of South Africa will provide \$2.30 million co-funding from the government's Renewable Energy Subsidy Fund, Renewable Energy Directorate budget, and in-kind contribution, over the Project implementation period.</p> <p>2. This project is expected to leverage \$ 9.00 million from the private sector for investment in CSWH systems sold under this project. As such, this leveraged fund cannot be committed in the same manner as Government or donor funds. However, unlike in many other countries, South Africa's financial markets have the required motivation and capability to provide funds of this magnitude.</p>				

Component A: Renewable Energy Power Generation

3.2 For renewable energy power generation, the project will assist South Africa in the creation and/or strengthening of the organizations and institutions that would help the government meet its renewable energy target. The capacity areas include development of legal and policy frameworks, promotion, regulation, service provision, and monitoring and evaluation of renewable energy power generation. The agencies would cover DME, NERSA, and potential project sponsors and financiers. Details are given in table 3.

3.3 Sub-Component 1. Policy and Regulatory Framework: This sub-component will develop legal, policy and regulatory framework, taking account of the experience with promoting grid-connected renewable energy power generation in both developed and developing countries, particularly the feed-in laws, renewable energy portfolio standards, and competitive tendering (see Annex 15 for details). The project will also adopt a mandated market policy that is appropriate for South Africa to achieve the renewable energy target and reduce costs. Currently, the South African government is contemplating to adopt a feed-in tariff scheme to promote renewable energy. This project will assist the government in developing a detailed design of the feed-in tariff policy and development of a draft Renewable Energy Law. It will include the following four sub-components:

- (a) 1.1 Reviewing renewable energy policy instruments and financing mechanisms of successful renewable energy programs worldwide, and recommending their adoption to South Africa;

- (b) 1.2 Supporting DME and NERSA to develop a legal, policy, and regulatory framework for renewable energy;
- (c) 1.3 Developing detailed financing mechanisms for covering the incremental cost between renewable and conventional energy; and
- (d) 1.4 Updating resource-specific supply curves in terms of the renewable energy target set in the government's *White Paper on Renewable Energy*, all through the provision of technical advisory services.

3.4 Sub-Component 2. Capacity Building: This sub-component will carry out capacity building activities to strengthen the relevant public and private sector institutions, and to enable them to meet the renewable energy power generation target. It will build capacity for government agencies such as DME and NERSA, as well as industries and financial institutions. It also will set up a Help Desk to provide advisory services and matching grants for project developers to conduct pre-feasibility studies to facilitate private sector investment in renewable energy. The TA provided by this project is expected to leverage significant private sector funds. It will include the following three sub-components:

- (a) 2.1 Developing public and private sector institutional capacity for renewable energy investments;
- (b) 2.2 Developing resource information and dissemination of renewable energy related information, all through the provision of technical advisory services; and
- (c) 2.3 Provision of Matching Grants to strengthen the capacity of the private sector to implement renewable energy Capacity Building Subprojects, and development of a “help desk”, including: (i) facilitating activities for renewable energy investments; (ii) preparing to pre-feasibility level renewable energy investments; and (iii) facilitating activities for promotion of off-grid renewable energy.

3.5 As a result of the TA, it is expected that in the four-year project period, renewable energy projects will be undertaken in conversion of landfill gas to electricity, sugar mill and pulp & paper cogeneration, and small hydro power generation. The total renewable generation capacity installed is expected to be about 100–135 MW (yielding about 600–800 GWh) with a capital cost of US\$90–120 million.

3.6 These investments will be financed outside this project by the private sector, with a small amount of government subsidies. In some cases, the financial viability of these investments will be enhanced by carbon financing, such as those provided by the Bank's carbon funds, but this does not reduce the need for upfront financing of capital costs, as these funds are paid only after the electricity is actually produced.

Component B. Commercial Solar Water Heating

3.7 CSWH is an integral component of South Africa's renewable energy policy framework. However, it is important to recognize that solar water heating is a substitute for all types of power generation, whereas renewable energy power generation is a substitute for fossil fuel power generation. As a result, solar water heating transactions are not linked to transmitting power over the main power grid, and there is no need to involve the grid operator (Eskom) in promoting this resource.

3.8 Sub-Component 3. Capacity Building: The sub-component will provide TA and capacity building to professional, technical, and business groups in key market segments and companies engaged in selling CSWH systems and services. This project will not support any renewable energy resource other than CSWH. Nevertheless, as shown in Table 1, CSWH companies are expected to contribute significantly towards the target of 10,000 GWh. There are two reasons for singling out CSWH for inclusion in this project. *First*, in contrast to other resources, this resource is near-commercial, and does not require significant subsidies. As such, it is suitable for GEF support aimed at reducing the barriers facing this resource. *Second*, most of the other resources are not near-commercial and require significantly larger subsidies to make them viable. However, they are suitable for sale of carbon emission reductions, the potential for which is shown by the ongoing discussions and progress already made in South Africa between interested buyers and sellers. In some cases, such sales may not be possible, and subsidies would have to be provided by the government, consumers, or some other source. It will include the following two sub-components:

- (a) 3.1 Carrying out activities to support the development of the solar water heating industry to international best practice levels through technical assistance in developing standards and codes for CSWH, promotion campaigns, and training.
- (b) 3.2 Provision of Matching Grants and Performance Grants to Eligible Beneficiaries, to establish a program for small and medium size private enterprises to design and implement CSWH Subprojects including, *inter alia*: (i) develop CSWH business development activities; (ii) improve performance in installation of systems; and (iii) meet the requirements for a code of conduct for use of best practice in designs, equipment and installation, transparent and credible practices in dealing with consumers. This sub-component will establish a "participating CSWH company program", which will assist the companies in a variety of ways on a as-needed basis. Company program assistance will include the following: securing certifications that companies' equipment meets standards; conducting independent installation and performance verifications of demonstrative subprojects to increase customer confidence; facilitating equipment performance guarantees in case this should be needed initially; providing co-finance performance grants for design, installation, or improvement; and monitoring and documentation of systems that are deemed to be demonstrative or path-breaking. In return, the participating companies will agree to meet the program's code of behavior and risk suspension in case they fail to meet the conduct code. These features will significantly improve the companies' status and make them more credible to their potential customers and lenders.

3.9 Supporting the implementation of Component A and B of the Project, including:

- (a) 4.1 Conducting due diligence on specific renewable energy investment that would be supported by DME;
- (b) 4.2 Monitoring and evaluation of progress towards achieving the renewable energy target set in the government's *White Paper on Renewable Energy*, and performance of GEF Trust Fund Grant and Recipient's funds for the Project; and
- (c) 4.3 Strengthening the capacity of the Implementation Support Unit (ISU) for Project coordination, management, and implementation.

Table 3: Technical Assistance, Capacity Building, and Implementation Support			
	<i>Funding source (US\$)</i>		
	Government/ private	GEF	Total
Component A. Renewable Energy Power Generation			
1. Policy and regulatory framework			
1.1 Review renewable energy policy instruments and financing mechanisms, and recommendations for South Africa	25,000	50,000	75,000
1.2 Develop legal, policy, and regulatory framework of mandated market policy for renewable energy implementation	200,000	1,000,000	1,200,000
1.3 Develop financing mechanisms, including voluntary green premiums	100,000	300,000	400,000
1.4 Update resource-specific supply curves in terms of total (10,000GWh) target, and corresponding green premium and financing requirements	100,000	100,000	200,000
2. Capacity building			
2.1 Capacity building for government agencies (DME & NERSA), industries, and financial institutions	200,000	500,000	700,000
2.2 Resource information development and dissemination; program promotion	325,000	450,000	775,000
2.3 "Help Desk" (advisory services and matching grants) to guide renewable power project developers, including for off-grid renewable energy	350,000	1,300,000	1,650,000
Component B. Commercial Solar Water Heating			
3. Capacity building			
3.1 Best practices, standards, promotion	100,000	400,000	500,000
3.2 Establish and operate "participating CSWH company program"* (matching grant and performance grant)	9,200,000	1,000,000	10,200,000
Implementation support for Components A and B			
4. Implementation support			
4.1 Due diligence on specific projects supported by Government	200,000	150,000	350,000
4.2 Monitoring and evaluation, and mid-term review	200,000	200,000	400,000
4.3 DBSA and ISU project coordination and implementation	300,000	550,000	850,000
Total	11,300,000	6,000,000	17,300,000
* The leveraged fund of US\$ 9.0 million under item 3.2 is the estimated cost of the equipment to be installed by the CSWH companies under this project.			

4. LESSONS LEARNED AND REFLECTED IN THE PROJECT DESIGN

4.1 Since there has been no significant experience with renewable energy power generation in sub-Saharan Africa, the only available lessons are from experience in other parts of the world. GEF—one of the prime supporters of renewable energy power generation—recently sponsored a forum that reviewed the worldwide experience on grid-connected renewable energy policies. The main lessons derived are discussed below and Annex 15 listed detailed lessons learned from other countries.

4.2 Twenty-five years of experience with successful renewable energy programs demonstrates that the implementation of an enabling environment of legal, policy, and regulatory frameworks to attract large-scale capital investments is instrumental to scaling up renewable energy. Such frameworks should ensure fair and open grid access and long-term stable tariffs for Independent Power Producers (IPPs). Long-term price predictability through long-term power purchase agreements (PPAs) with transparent and adequate pricing is the most important factor to attract investors.

4.3 Based on successful renewable energy programs around the world, three major mandated market policy options to promote renewable energy are operating to date in the marketplace:

- (a) *Price-based feed-in laws*, which require mandatory purchase of renewable energy at a fixed price. These are used in Germany, Spain, and France.
- (b) *Quantity-based renewable energy portfolio standards (RPS)*, which require that a minimum share of power or a minimum level of installed capacity in a given region must be met by renewable energy. These are used in Australia, Denmark, Italy, the Netherlands, and some U.S. states.
- (c) *A tendering mechanism*, which involves government-sponsored competitive bidding processes for the acquisition of renewable electricity. Long-term contracts are awarded to lowest priced projects. This is used in the British Non-Fossil Fuel Obligation, Ireland, and California.

4.4 All three mandated market policies ensure the right for the power suppliers to recover incremental costs of renewable energy from consumers, and to be able to connect to the grid. Each approach has its own advantages and disadvantages.

4.5 *Feed-in laws* produce high penetration rates in a short period, create local manufacturing opportunities, provide strong incentives for private investments, and can be cost effective if the tariff is periodically and wisely adjusted. To date, feed-in laws have demonstrated the highest installation rates for renewable energy and are considered most desirable by investors given their price certainty. *RPS* are good at reducing cost and price with competitive bidding, yet tend to favor least-cost technologies and established industry players unless separate technology targets or tenders are put in place. They are also more complex to design and administer than feed-in laws. *Tendering* policies are effective at reducing cost, but ensuring that signed contracts are realized is a key challenge.

4.6 The types of instruments selected should be based on objectives, country conditions, and power sector structure. There is no single solution. The effectiveness of a particular policy will rely on how well it is designed and enforced.

4.7 A range of financial incentives exists to level the playing field for renewable energy investments. These incentives can decrease upfront capital costs through subsidies, reduce capital/operating costs through tax credits, improve revenue streams with carbon credits, and provide financial support via loans and guarantees. Experience demonstrates that output-based incentives are generally preferable to investment-based incentives for grid-connected renewable energy. This is because the investment-based mechanisms do not necessarily provide incentives to generate electricity or maintain the performance of the renewable energy plants once they are installed, whereas the output-based incentives promote the desired outcome—generation of electricity from renewable energy.

4.8 The most frequent approaches for covering the incremental cost of renewable energy and the funding of the various policy measures are passing the costs onto consumers through a systems benefits charge (SBC), imposing a carbon tax on fossil fuel, and setting up a dedicated fund financed directly by the government or with donor support.

4.9 Project design fully reflects these lessons: the regulatory framework to be developed will create the appropriate incentives and market signals, and capacity building will be provided to various actors in the supply chains for renewable energy generation.

4.10 Furthermore, lessons learned from the Bank’s experience in South Africa have also been reflected in the project design. As South Africa is a sophisticated client, the Bank’s interventions in South Africa should be demand-driven, bring value added services, build local capacity, and act as a “knowledge bank”.

5. ALTERNATIVES CONSIDERED AND REASONS FOR REJECTION

5.1 For renewable energy, the conventional approach of the Bank, including GEF, of financing renewable energy power generation investments, was rejected. In other words, unlike most renewable energy projects where the Bank and/or GEF finance both TA and investments, this project supports only TA. South Africa has well-developed private and financial sectors. Project developers have access to both domestic and international financial market to finance investment in renewable energy. However, the current main barriers to renewable energy development in South Africa are lack of regulatory frameworks and limited local capacity to identify and develop renewable energy projects. Therefore, this project will only provide TA to remove these barriers. As a result, an improved enabling environment and local capacity are expected to leverage private sector investment.

C. IMPLEMENTATION

1. PARTNERSHIP ARRANGEMENTS

Related Ongoing Activities

1.1 There are some activities related to renewable energy power ongoing outside this project:

- Development of power generation projects. The adoption of the *White Paper on Renewable Energy* has stirred some interest in the private sector in developing suitable projects. This interest has been whetted by the possibility of obtaining external carbon funds, following the government's approval of the Kyoto Protocol. These projects, which are in advanced stages of development, are special cases in the sense that there are unique underlying factors. For example, the Durban landfill-gas-to-electricity project is for own use; that is, not for sale to the main grid, for which there are no rules so far.
- Government subsidies. The government has established a Renewable Energy Subsidy Fund (about US\$500,000-\$700,000 per year), managed by DME, to subsidize suitable renewable energy power projects. The purpose is to get some experience with the nature of the projects that are likely to emerge in the future and get an estimate of the extent of subsidies that would be required to reach the 10,000 GWh target. As explained in Table 2, the government has committed the majority of this Subsidy Fund as co-funding to this project.
- DANIDA capacity building in energy efficiency and renewable energy. This DANIDA project has recommended market rules for renewable energy in South Africa, developed a cost-supply curve for renewable energy development, and conducted a renewable energy resource assessment that focuses on solar, biomass, and hydro. This GEF project builds on the DANIDA study recommendations to assist the government in developing a detailed legal, policy, and regulatory framework for renewable energy. Resource assessment under this project will primarily focus on compilation of existing renewable energy resource information in a database and mapping to make it available for private developers.
- UNDP/GEF solar water heaters for low-income housing in peri-urban areas. This UNDP project aims to support a solar water heater business plan in South Africa in order to overcome market barriers for widespread use of residential solar water heaters. To complement this UNDP project, this proposed GEF project will only support commercial solar water heaters.

1.2 Annex 4 also describes in detail the UNDP/GEF South Africa Wind Energy Project, and proposed coordination mechanisms with UNDP and DANIDA. In addition, it is expected that, outside this project, carbon funds will help finance renewable energy investments.

2. INSTITUTIONAL AND IMPLEMENTATION ARRANGEMENTS

2.1 The DBSA will be the implementing agent for this project. A Memorandum of Understanding (MoU) will be entered into between DME and DBSA for the purposes of spelling out the overall implementation arrangements under which DBSA will act as the implementing agent of DME. Furthermore, for the purposes of carrying out the agreed activities in the MoU, DBSA would be contracted for services by DME pursuant to Bank guidelines.

2.2 DBSA is a well-established agency that has considerable expertise in both financing and managing development projects. In recent years, DBSA has taken an interest in promoting renewable energy investments. DBSA is familiar with World Bank procedures and does not face constraints in areas such as financial management and procurement. Although DBSA does not have extensive in-house capacity on renewable energy, this is not a constraint as DBSA will set up an ISU and hire (mainly local) consultants in implementing this project.

2.3 A Steering Committee (SC) to be appointed by DME will oversee the project. The SC will be responsible for monitoring project implementation and identifying actions to ensure that it proceeds in a timely and efficient manner. The SC will consist of five members: (i) Deputy Director General of Hydrocarbon, Energy Planning, and Clean Energy, DME as its Chair; (ii) Chief Director, Clean Energy, DME; (iii) Director, New and Renewable Energy, DME; (iv) National Energy Regulator of South Africa (NERSA); and (v) Central Energy Fund (CEF). The SC will meet at least twice every year. The SC may also expand to include technical expert(s) in renewable energy and private sector representative(s), as required.

2.4 The SC will provide overall advice and guidance to the project, and ensure recommendations made by the project will be incorporated in policy and regulatory frameworks and implemented. The SC will facilitate good coordination between the different agencies involved in scaling-up renewable energy implementation. The SC shall discuss and approve progress reports, changes in project implementation, and other items as may be requested by the DME. The SC shall monitor that proper quality assurance of the outputs is carried out by the Renewable Energy Market Transformation (REMT) project staff. The SC will guide and follow the development of the project according to the implementation schedule, and cause periodic progress reports to be submitted, including use of funds, to the Bank and DME.

2.5 The SC will form a working group of designated staff to provide close supervision and guidance to the project team during implementation. The SC may also decide to establish an advisory board or use other mechanisms to present and share ideas and to otherwise involve key external stakeholders in the implementation process. The stakeholders will include different sections within the renewable energy power generation and CSWH communities (for example, consumers, academic, finance, consulting engineers, NGOs, project developers/owners, and Eskom).

2.6 The DBSA will establish an ISU to manage day-to-day activities during the four years of the REMT project implementation. The ISU will be responsible for carrying out the various project activities—that is, the policy and institutional framework, capacity building, and implementation activities. As such the ISU will also be handling quality assurance and progress reporting. The ISU will also be responsible for administering the performance grants for CSWH

subprojects and the matching grants for renewable energy and CSWH capacity-building activities. The private sector will be responsible for implementing all the investments supported under this project.

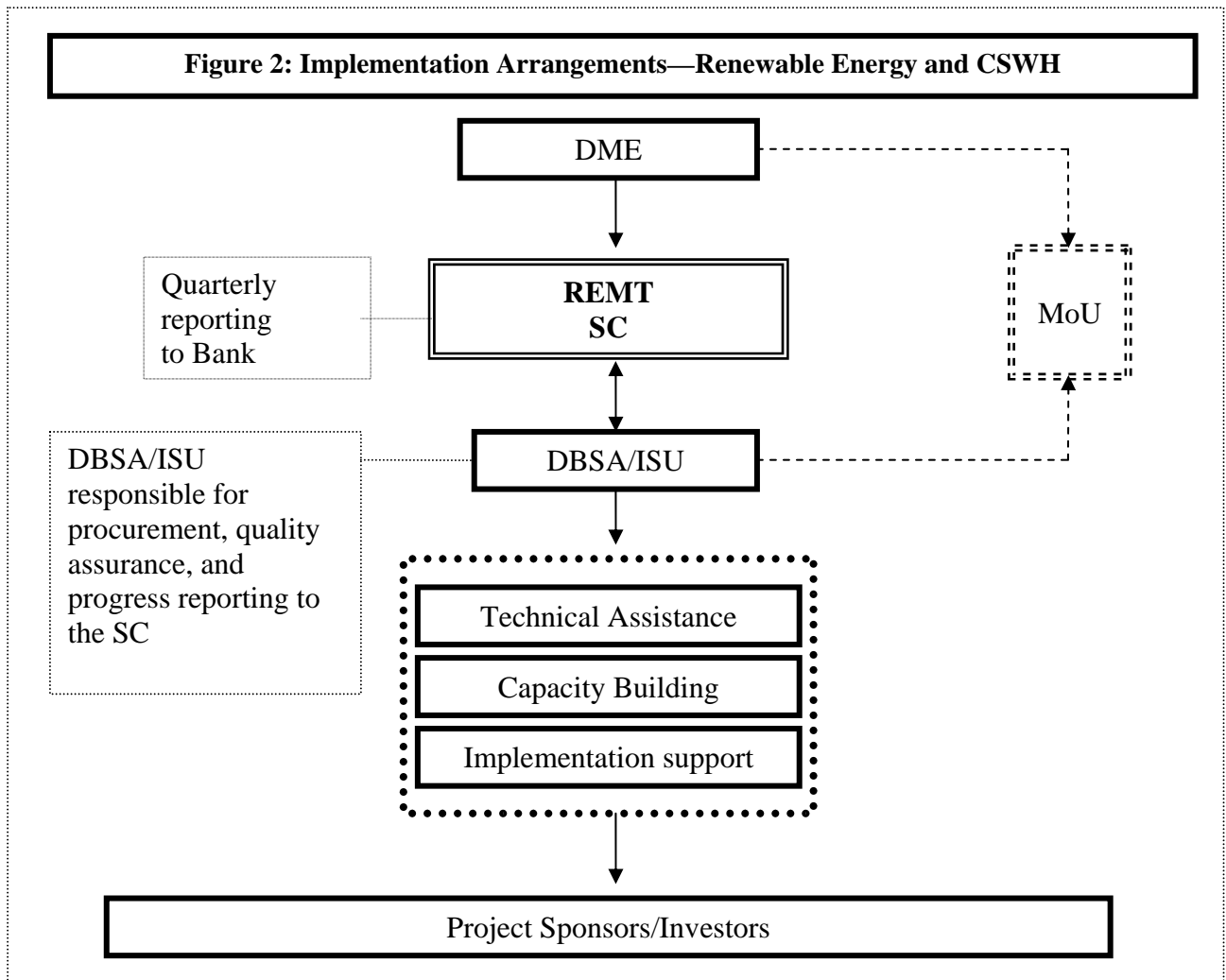
2.7 The ISU will be headed by an international Project Coordinator, who will lead the implementation activities of the REMT project and will be responsible for the substantive work for renewable energy policy and institutional framework development and capacity building. In addition, the ISU will also consist of a business support manager, who will be a national consultant and is responsible for implementing the Help Desk to guide project developers for both renewable energy power generation and CSWH, and one support staff. Existing DME staff will be allocated to provide close supervision and guidance to the project team during implementation. Short-term consultants and advisors will provide services on an as-needed basis.

2.8 The Agencies Unit within DBSA is responsible for procurement, financial management, disbursement, budgeting, accounting, treasury services, and corporate services such as human resources management, legal advisory services, and so forth.

2.9 The direct stakeholders involved in this project are as follows:

- DME: overall responsibility for this project
- NERSA: responsible for regulating the power sector, and will be assisted by the project in formulating the rules by which independent power producers (including renewable energy based generators) will sell power into the main grid
- CEF: mandated to engage in acquisition, exploration, generation, marketing, and distribution of any energy form and engage in research in the energy sector
- DBSA: implement the project on a day-to-day basis
- CSWH companies: will be assisted by the project
- Professional, technical, and business groups: will receive capacity building under the project
- Potential and actual buyers and financiers of CSWH systems: will receive information under the project
- Potential renewable energy generation developers: will be assisted by the project in developing their plans

2.10 The relations between the different stakeholders are shown in the figure 2 below, and the detailed implementation arrangements and flow of funds are shown in Annex 6.



3. Monitoring and Evaluation of Outcomes/Results

3.1 The overall responsibility for monitoring and evaluation will be with DME; the day-to-day responsibility will be with the ISU overseen by DBSA. DBSA is well-suited to undertake this type of work and will hire additional consultants as needed. The costs of this activity have been included in tables 2 and 3.

3.2 The ISU will submit regular reports to DME, which will include all the information necessary for managers and policy makers to assess the project’s effectiveness.

3.3 The monitoring and evaluation system will consist of four parts and, to the extent feasible, will be integrated in the preparatory activities for the mid-term review of the *White Paper*:

- (a) Monitoring TA activities: This will consist of indicators of (i) progress of various studies and modalities and level of the implementation of their recommendations and action plans, and (ii) training and capacity building of various stakeholders.
- (b) Monitoring CSWH companies: Key information will be collected about the nature, magnitude, and performance of the systems involved (including investments and power generation avoided); the customers' views about their systems; and the overall activities of the participating companies.
- (c) Monitoring renewable energy power generation: Key information will be collected about the nature, magnitude, and performance of the installations involved, including investments and power generation.
- (d) Monitoring progress towards the overall 10,000 GWh target: This will be developed as a part of the TA activities under the project, and will be used to assist the government in its mid-term evaluation of its overall target.

4. SUSTAINABILITY AND REPLICABILITY

Sustainability

4.1 South Africa's commitment to renewable energy is shown by the *White Paper on Renewable Energy*, and there is little risk that the policy framework supported by this project will not be developed.

4.2 There is limited concern about the sustainability of the investments undertaken either under this project or within the framework developed by the project. This is because the investments would be installed and financed mainly by private sector entrepreneurs, who would have a clear incentive to maintain and sustain their individual investments.

4.3 However, there are some concerns about South Africa's ability to achieve its long-term target of 10,000 GWh, even if the framework is successfully developed. The main source of this concern is the low cost of generating coal-based power in South Africa, which makes it difficult for renewable energy to be competitive. As a result, local or external funds are required to support renewable energy investments. Long-term sustainability depends upon the following: (i) future increases in Eskom's costs, arising from the need to add generation capacity; (ii) reductions in renewable energy costs, arising from scale economies; and (iii) the continued availability of an adequate level of local and global carbon funds.

4.4 As mentioned in Section A1, given the current severe power shortage in South Africa, Eskom plans to expand power capacity to meet growing demand. According to NERSA, the power tariff for newly built power plants has increased to 3.6–4.3 U.S. cents/kWh. With additional revenue streams from carbon financing, some renewable energy technologies can be financially viable at this tariff level. In addition, based on the recommendations made from the DANIDA study, the government currently plans to adopt a mandatory feed-in tariff and a voluntary green electricity trading scheme to promote renewable energy development.

4.5 It is expected that increased government funds to support renewable energy investments would become available in the future. First, a track record would be established that would show

that renewable energy investments can be successfully financed and undertaken in South Africa, and the extent of the grants required would also be clear. This would make it easier to incorporate such grants into the budgetary process. Second, it is expected that other high-priority subsidized energy activities such as rural electrification will reach their end in the future, thus creating additional fiscal space for renewable energy. However, there is no assurance that these events will actually take place, with the implication that future government funds to support renewable energy are not assured.

4.6 It is also expected that external carbon funds will be available to support renewable energy in the future. While current indications are that such funds will be available, their actual availability will depend upon various factors beyond the ambit both of this project and the Government of South Africa. Much will depend upon how various international agreements, such as the Kyoto Protocol, are actually implemented—there is no experience so far—and how risky the international community views investments in South Africa. Thus, there is no assurance that external funds will be available in the long-term in the needed amounts.

Replicability

4.7 After the legal, policy, and regulatory framework for renewable energy is put in place and institutional capacity is strengthened through this project, it is expected that this project will leverage significant private sector investment to scale up renewable energy development in South Africa. There is clear potential for long-term growth of the CSWH in both the retrofit market as well as the new opportunities opened by the growth of the economy.

4.8 Outside South Africa, the framework developed in this project would also be applicable in other countries throughout Africa, as well as in other parts of the world. At present, an increasing number of developing countries are developing renewable energy legal and policy frameworks, and this project can be replicated in other developing countries.

5. CRITICAL RISKS AND POSSIBLE CONTROVERSIAL ASPECTS

5.1 The project has no significant risks and appears to be largely non-controversial, as the project will primarily provide technical assistance and capacity building to local stakeholders in South Africa, and the implementing agencies are well-established and suitable for the job. The Project has been rated as a Category C project under the Bank's safeguard policies. The principal risks, their ratings, and related mitigation measures are as follows:

Table 4: Principal Risks, Ratings, and Mitigation Measures

Main Risks	Risk Rating	Risk Mitigation Measures
A lack of private sector investment in renewable energy projects	L	The project will provide advisory services, matching grants, and performance grants to the private sector developers through the Help Desk.
Inadequate power purchase tariff for renewable energy projects	L	The project will assist the government in developing a regulatory framework to set up the feed-in tariff levels for renewable energy technologies.
Renewable energy power cannot be sold to the grid	M	The project will assist the government in developing a Renewable Energy Law that requires mandatory purchase of renewable energy.
Overall Rating	L	

S: Substantial; M: Moderate; L: Low

6. CREDIT CONDITIONS AND COVENANTS

6.1 The conditions for negotiations have already been met as follows:

- Draft Procurement Plan
- Draft Description of status, responsibilities, composition, and functioning of the project SC
- Draft MoU between DME and DBSA
- Draft Terms of Reference for the Project Coordinator

6.2 The conditions for effectiveness are as follows:

- Establishment of SC
- Signed MoU between DME and DBSA
- Appointment of DBSA as the Implementing Agency
- Appointment of the Project Coordinator in ISU according to the Bank Consultant Guidelines

6.3 Disbursement conditions are as follows:

- Disbursement for the Matching Grant, or, the Performance Grant will be made in accordance with the eligibility criteria and procedures, and on terms and conditions set forth in the Rules and Policies of Evaluation and Assessment of proposals.

D. APPRAISAL SUMMARY

1. ECONOMIC AND FINANCIAL ANALYSIS

1.1 The economic and financial analysis examined a sample of potential projects for each renewable energy technology—small hydro, sugar bagasse, wind, pulp and paper industry, landfill gas, and solar water heating—to reach the 10,000 GWh target set in the government’s White Paper for Renewable Energy. Therefore, REMT can proceed with some confidence that there are viable renewable energy project transactions that will be taken up by the private sector in response to the market transformation activities planned for REMT.

1.2 The economic and financial analysis follows a renewable energy cost supply curve approach, as shown in Figure 1, based on a detailed economic and financial analysis of a sample of projects to meet the government’s target of 10,000 GWh per year. This approach is particularly appropriate to a sector where the bulk of the projects are expected to be undertaken in the private sector, structured either as non-recourse financed IPPs or under balance sheet financing by large corporations (e.g. as in pulp and paper).

1.3 While economic analysis shows a project to be economically attractive, based on economic costs, shadow priced as appropriate, and benefits assessed on the basis of avoided generation costs priced at economic long-run marginal cost (LRMC), financial returns can be insufficient for implementation by the private sector. This is because traditional financial analysis, based on discounted cash-flow accounting, undervalues future fuel price risks and completely ignores the environmental and health costs of fossil-fueled power plant emissions. As a result, the current utilization of modern renewable energy (excluding traditional biomass use) in many countries is quite small. Given the market distortion that environmental externalities and diversification values are not recognized in the market place, together with a series of market barriers, financial incentives are required in the form of higher level of tariff, government subsidy, concessional loans from development banks, and various forms of public-private partnerships to attract investors to achieve the economically viable optimum quantity of renewable energy.

1.4 The economic and financial analysis demonstrated that, with the exception of wind, it was possible to find viable projects for all the resources. The analysis shows that it is feasible to reach the government’s target of 10,000 GWh with relatively small amounts of carbon finance. The analysis also shows that the only resource where carbon finance increases the returns significantly is landfill gas; in other cases, carbon finance will play mainly a catalytic role. Table 1 shows the technology mix and supply potential from each technology to reach government’s target of 10,000 GWh.

Economic Analysis

1.5 A standard economic analysis was undertaken for each sample project. NPV and economic rate of return (ERR) are calculated, and benefits of avoided energy at the applicable substation are calculated at the LRMC. ERR is calculated both with and without environmental benefits. In economic analysis, avoided greenhouse gas emissions are valued at the reported PCF

transaction price for the Durban Landfill gas project as the proxy for global willingness to pay for South Africa's carbon reductions.

1.5 The analysis identified a number of candidate projects to be financed by the private sector under REMT. The calculated ERRs with environmental benefits range from 13 percent to 24 percent for small hydro projects, 15 percent to 38 percent for sugar bagasse projects, 18 percent for a pulp and paper project, and 31 percent to 34 percent for landfill gas projects.

1.6 An economic analysis of a CSWH system was conducted (see Annex 9 for details). In this analysis, the economic costs are the current costs prevailing in South Africa. It is expected that costs will decline in the future as the scale of the market increases. There are two types of benefits:

- Local: Since the use of CSWH instead of conventional electricity is a form of “fuel switching,” the benefits are the costs avoided by switching; that is, the economic cost of the electricity saved. In the CSWH case, this consists of the generation plus network costs, and in South Africa, Eskom's tariff is the best available indicator of these costs. For simplicity, the “demand charge” and the “energy charge” have been rolled into a single cost per kWh. It is estimated that this combined charge is 25 rand cents (3.62 U.S. cents) per kWh. The economic cost of generation is expected to increase in the next 3–5 years when Eskom would have to add generation capacity to meet peak demand.
- Global: The market value of the carbon emission reductions (CERs) is a measure of global benefits, even though it is recognized that, in practice, it is not yet feasible to sell these CERs because of high transaction costs. The CER price is estimated to be US\$4/ton of CO₂.

1.7 The economic analysis shows that, at today's CSWH costs and power tariffs, the CSWH systems are marginally attractive, with an internal rate of return of 14 percent based only local benefits, and 17 percent on adding global benefits. This is consistent with the low level of CSWH market penetration, and indicates that CSWH cost reductions are necessary to make them more attractive to individual end-users as well as the economy as a whole.

Financial Analysis

1.8 A standard financial model to calculate financial internal rate of return (FIRR) has been developed. The financial analysis is conducted from the perspective of the implementing entity, and the calculated FIRR is therefore a function of the capital structure assumed. In addition, the projects to be financed will be screened by private promoters, commercial lenders, external carbon fund financiers, and in some cases government agencies. The private sector will only invest commercially feasible projects. The financial analysis identified a number of financially viable small hydro, sugar bagasse, pulp and paper, and landfill gas projects, which can be financed by the private sector under REMT.

2. TECHNICAL

2.1 The project itself does not feature any significant technical issues, apart from the investments in the CSWH component. These investments will meet the technical standards established in South Africa.

3. FIDUCIARY

3.1 Disbursements from the Grant will be made on the basis of interim financial reports (IFRs). DBSA understands that this approach relies on comprehensive reports generated from its financial management system rather than the transaction based approach DBSA is currently using for the ongoing Bank-supported projects. Resources will need to be made available to ensure timely reporting and accuracy of information.

3.2 Project financial management will be overseen by the existing DBSA Finance Department, who will be responsible for receiving and reviewing the completeness and appropriateness of invoices and other requests for payment. The actual capture and settlement of those invoices will be made by and through the existing DBSA payments system. While the DBSA has its own existing “Administrative and Accounting Procedures Manual,” it will prepare an appropriate update or other version to incorporate the new positions and arrangements for the REMT ISU. This update or separate version will be circulated to the Bank for comment.

3.3 The Grant Agreement will require the submission of audited financial statements to the Bank within six months after the financial year-end. The financial statements will consist of the following: (i) A *Statement of Sources and Uses of Funds* that recognizes all cash receipts, cash payments, and cash balances controlled by the project; (ii) The *Designated Account Reconciliation*; and (iii) The *Accounting Policies Adopted and Explanatory Notes*. The explanatory notes should be presented in a systematic manner with items on the *Statement of Sources and Uses* being cross-referenced to any related information in the notes. Examples of this information include the following: (i) a summary of fixed assets by category of assets; (ii) copies of IFRs; and (iii) a *Management Assertion* that Bank funds have been expended in accordance with the intended purposes as specified in the relevant World Bank legal agreement.

3.4 The internal audit at DBSA is in-house. For the DBSA, the external audit will be carried out annually by the Controller and Auditor General (CAG). The external audit will cover all World Bank funds and counterpart funds at all levels of project execution. The auditor will be required to express an opinion on the audited project financial statements only, in compliance with International Standards on Auditing (IFAC/INTOSAI pronouncements), and submit the audit report within six months of the end of the financial year. In addition, detailed management letters will be prepared and submitted to management for follow-up. These letters will contain the auditor's assessment of the internal controls, accounting system, and compliance with financial covenants in the Grant Agreement, and suggestions for improvement. Although the Bank is satisfied with the Auditor General Standards, the agreed audit terms of reference will need to be reviewed for compliance with the requirements of the Bank.

3.5 Financial management supervision will be carried out regularly by the Bank’s Financial Management Specialist (FMS) at least once a year. The FMS will conduct financial management supervision shortly after project effectiveness. The FMS will also review the annual Audit Reports and Management Letters from the external auditors and follow up on material accountability issues by engaging with the Bank’s Task Team Leader for REMT, the DME, DBSA, and/or auditors.

4. SOCIAL

4.1 This project itself does not pose any significant social issues. However, there is evidence that some of the investments financed under the framework developed by this project may raise significant social issues, which is not unusual for power generation projects. These issues will be addressed during the course of each such generation projects, which will all have to meet the well-established South African guidelines for these types of projects; these guidelines are acceptable to the Bank.

5. ENVIRONMENT

5.1 This project itself does not raise any significant environmental issues. Any environmental issues raised by some of the investments financed under the framework developed by this project will be addressed during the course of each such generation projects, which will all have to meet the well-established South African guidelines for these types of projects; these guidelines are acceptable to the Bank.

6. SAFEGUARD POLICIES

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment (OP/BP/GP 4.01)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Natural Habitats (OP/BP 4.04)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pest Management (OP 4.09)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cultural Property (OPN 11.03 , being revised as OP 4.11)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Involuntary Resettlement (OP/BP 4.12)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Indigenous Peoples (OD 4.20 , being revised as OP 4.10)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Forests (OP/BP 4.36)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Safety of Dams (OP/BP 4.37)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Projects in Disputed Areas (OP/BP/GP 7.60)*	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Projects on International Waterways (OP/BP/GP 7.50)	<input type="checkbox"/>	<input checked="" type="checkbox"/>

6.1 The project is not expected to present any environmental or social risk. Solar water heating is not a “listed activity” with respect to South African environmental requirements, and therefore would not be subject to the environmental screening or environmental assessment process. Since the project does not involve any land taking, and the only construction will be

* By supporting the proposed project, the Bank does not intend to prejudice the final determination of the parties' claims on the disputed areas

within the perimeter of existing institutional, commercial, or industrial establishments (and in fact, mostly on rooftops), no social safeguards are expected to be triggered. Therefore, the project has been rated as a “C” (no environmental or social safeguard impact).

7. POLICY EXCEPTIONS AND READINESS

7.1 The project complies with all World Bank applicable policies and no exceptions are necessary. The Project Procurement Plan for consultants’ services has been reviewed by the Bank and is ready for the start of Project implementation. DME has prepared TORs for the Project Steering Committee, Project Coordinator, and MoU between DME and DBSA who acts as the implementing agent for DME.

Annex 1: Country and Sector or Program Background

South Africa – Renewable Energy Market Transformation Project

COUNTRY AND SECTOR ISSUES

1. **Overall economic conditions.** South Africa's economic performance during the first decade of freedom has been impressive on several counts. Sound macroeconomic policies and strong fiscal discipline contributed to the 3 percent average annual growth during the first decade after 1994. Recent economic performance has also been strong. Real GDP growth reached 4.9 percent in 2005 and 4.6 percent in 2006, employment has risen, and inflation has remained within the target band for over two and a half years. Foreign debt is low and overall borrowing has been brought below 40 percent of GDP. The fiscal deficit fell from 1.5 percent of GDP in FY2004/05 to 0.3 percent in FY2005/06, reflecting buoyant revenues. Owing to large capital inflows, international reserves continued to rise.

2. South Africa contributes 40 percent of Sub-Saharan Africa's GDP—its nine largest cities alone account for about 24 percent of Africa's GDP. Growth spillovers to the rest of the continent are exceptionally large by international standards: an additional percentage point of South African growth is associated with 0.5 to 0.75 percent GDP growth increases in the rest of Africa, independent of common regional shocks.

3. **Energy and Environmental Issues.** South Africa is one of the few countries in the world that heavily relies on coal to meet its energy needs, with 75% of total energy consumption from coal in 2004. It is the world's sixth largest coal producers, 90% of which was used for electricity generation and the synthetic fuel industry. As a result, South Africa has high greenhouse gas (GHG) emissions, the largest contributor in Africa.

4. **Power sector.** South Africa has a well-developed power sector, with a total installed capacity of 42 GW and a total electricity production of 244,607 GWh in 2004, which is predominantly coal-fired (92%), and includes nuclear (5%), hydro (2%), as well as solar, biomass, and gas (1%). South Africa accounted for 45% of the total power produced in all of Africa. The generation and transmission of power is concentrated in the hands of Eskom, the vertically integrated state-owned utility. Eskom is also the largest single distributor in the country in terms of energy sales for final consumption and number of customers, although there are more than 400 other distributors, mainly municipal electricity departments that also supply electricity to end customers. While Eskom is widely recognized as a world-class power utility (electricity prices in South Africa are among the lowest in the world, with an average sales price of around 2 U.S. cents per kWh), the Cabinet approved in June 1999 a plan to merge the large number of municipal distributors and Eskom's distribution businesses into six Regional Distribution Companies (REDs). However, implementation of the Cabinet's decision has been painfully slow and convoluted. The first RED was established only in 2005 and only on paper. Other changes to the generation and transmission sectors will be made in due course.

5. South Africa is currently experiencing power shortages and load shedding, as generation capacity has not increased over the past ten years, despite a steady growth in demand for electricity. Increasing power shortages in South Africa could pose a serious threat to sustained economic growth

and international competitiveness. ESKOM is currently planning to build 1,500 MW of power capacity each year over the next five years to meet the growing demand.

6. **Project background.** This project has been formulated after several years of dialogues and discussions between the World Bank and the Government of South Africa. In early 2000, the Minister of Energy (who is now South Africa's vice president) requested Bank assistance on two fronts: (i) utilizing renewable energy resources, and (ii) stimulating productive uses of electricity in the rural areas, where electricity had been successfully provided by Eskom under a subsidized program (which, however, had not led to income-generating activities). The Bank took the following measures in response:

- a) helped organize a People's Power workshop in South Africa in 2000
- b) helped draft the Government's *White Paper on Renewable Energy*, which was approved in 2003
- c) helped define a program to stimulate the productive uses of electricity in rural areas, in partnership with the Independent Development Trust (IDT) and a variety of stakeholders
- d) held extensive discussions with the Department of Housing about Bank assistance for an efficient-energy housing program, which did not proceed beyond the draft stage
- e) helped the government understand the practical opportunities open to South Africa under the Kyoto Protocol
- f) assisted the government with advice and expertise on a number of energy-related issues, such as ambient air pollution in townships like Soweto and removal of lead from gasoline

7. This proposed Renewable Energy Market Transformation (REMT) project is a result of this dialogue, and aims to help the government implement the *White Paper on Renewable Energy*. The project concept has been vetted by South Africa's National Treasury, which has formally requested the Bank to prepare this project using GEF grant support.

8. **Development of renewable energy.** The government has committed South Africa to reducing the country's GHG emissions. The government's *White Paper on Renewable Energy* (2003) sets the following target for renewable energy:

10,000 GWh (0.8 Mtoe) renewable energy contribution to final energy consumption by 2013, to be produced mainly from biomass, wind, solar and small-scale hydro. This is approximately 4 percent (1,667 MW) of the estimated electricity demand by 2013 (41,539).

The *White Paper* lists these sources for meeting the target:

The renewable energy is to be utilized for power generation and non-electric technologies such as solar water heating and bio-fuels.

9. South Africa has many renewable energy resources that can be used to generate power, but it is also well-endowed with low-cost, high-quality coal. At present, coal is and is likely to remain, from a financial viewpoint, an attractive source of power generation in South Africa, and renewable energy resources have remained largely untapped. At the same time, South Africa recognizes that the emissions of greenhouse gases, such as carbon dioxide, from the use of fossil fuels such as coal and petroleum products has led to increasing concerns, worldwide as well as in Africa, about global climate change, and it is the intention of the government to make South Africa's due contribution to the global effort to mitigate greenhouse gas emissions.

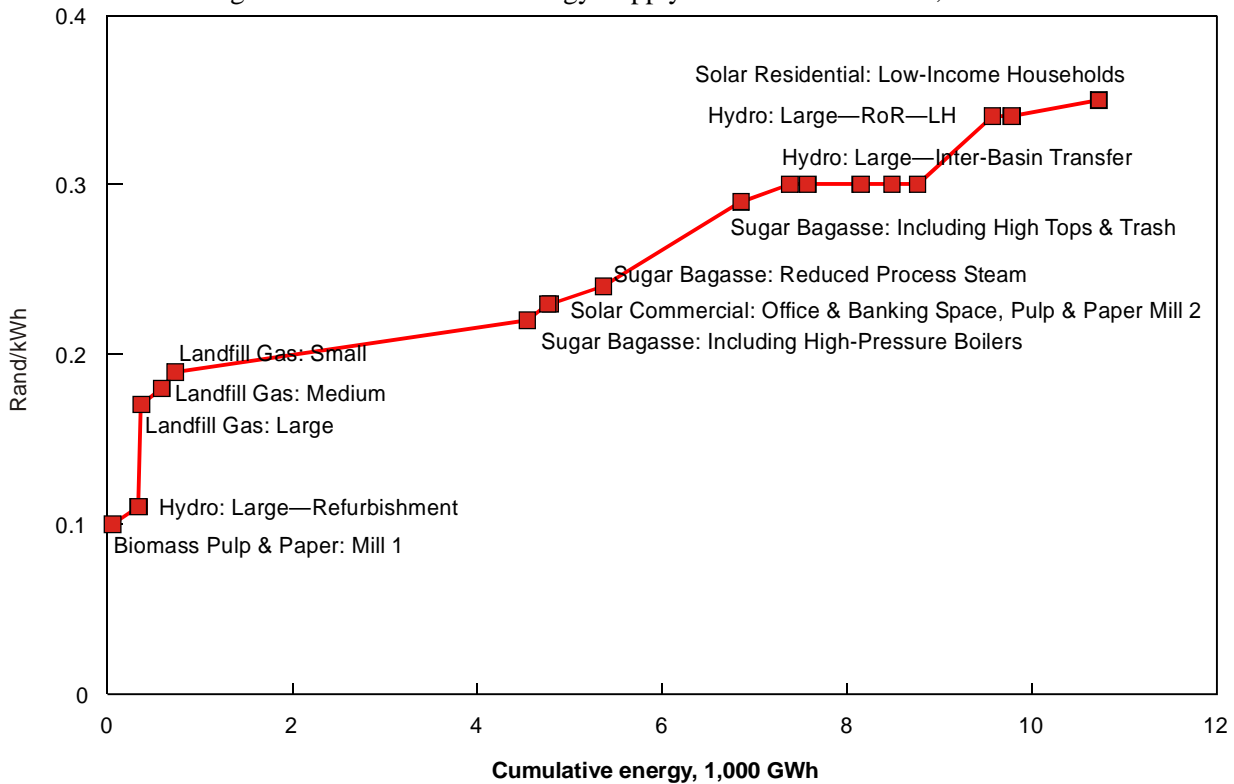
10. Government's long-term goal is the establishment of a sustainable renewable energy industry that will offer in future years an alternative to fossil fuels. The *White Paper on Renewable Energy* sets out the Government's vision, policy principles, strategic goals and objectives for promoting the potential of renewable energy. The 9 percent of final energy consumption currently provided by renewable energy has come about largely as a result of poverty (e.g. wood and animal waste used for cooking and heating). To get started on a deliberate path towards this goal, the Government's medium-term (10-year) target is that renewable energy sources share of final energy consumption should increase from 9 percent (2 216 793 TJ or 53 Mtoe in 1999) to 14 percent, an increase of 5 percent, by the year 2013. Specifically within the electricity sector, the Government's medium-term target is that renewable energy – excluding imports from large scale hydro – would provide about 5 percent of the total electricity generation.

11. This is an ambitious target. Achieving it requires a phased, flexible strategy for promoting renewable energy generation in a cost effective manner with limited number of "early win" investments based largely on relatively low cost technologies, such as waste-based cogeneration and commercial solar water heating. In keeping with this, the overall target for this Project is relatively modest, with scale-up to occur in the future. Further, mid-way through the ten-year government program, there would be a mid-term assessment, which would consider any changes required in policies, targets or implementation strategies, taking account of changes in costs of coal-based as well as renewable energy power generation, availability of international funds as well as any international obligations agreed-to by South Africa, and the South African budgetary situation.

12. There is also need for assurance that the "supply curve" of renewable energy shows that there are potential projects with reasonable costs. The estimated supply curve for the first 10,000 GWh shows that:

- Wind is not part of the first 10,000 GWh
- All of the landfill gas potential is within the first 10,000 GWh (and occupies a significant portion of the first 1,000 GWh)
- The balance of the 10,000 GWh target is made up of commercial solar water heating, small hydro, pulp & paper, and the sugar industry.

Figure A.1.1: Renewable Energy Supply Curve—The First 10,000 GWh



Source: Conningarth Economists, June 2004.

13. This “supply curve” should not be interpreted to mean that all the potential of a particular renewable resource will be fully used up by the GWh attributed to it. For example, the 240 GWh contribution of landfill gas (LFG) is from seven “identified projects” that have been studied in detail, and the additional contribution of 600 GWh is from 57 sites that have been studied in lesser detail. A very conservative approach was adopted for these 57 sites, and it is quite possible that the true potential is twice the estimated amount. A similar conservative approach has been used for the other resources also.

14. The government currently plans to adopt a mandatory feed-in tariff and a voluntary green electricity trading scheme to promote renewable energy development to achieve this target. In addition, given the high demand for solar water heaters, Eskom recently plans an aggressive solar water heater program to mitigate the power shortage. Solar water heaters have a large replication potential to reduce greenhouse gases by replacing fossil fuel combustion. Furthermore, the power tariff for newly built power plants has increased to 3.6–4.3 U.S. cents/kWh, according to the National Energy Regulator of South Africa (NERSA). With additional revenue streams from carbon financing, some renewable energy technologies can be financially viable at this tariff level.

15. Given South Africa’s strong industrial and financial sectors, and the high overall level of capacity, the 10,000 GWh target may appear to be easy to achieve. To the contrary, this is an ambitious target for South Africa, because it has significant barriers to renewable energy development. In principle, South Africa could eliminate these barriers on its own; however, long years of being cut off from international trends as well as the historical reliance on coal make it

very difficult for the country to move forward on renewable energy on its own. Consequently, the government has requested assistance from the World Bank and GEF.

16. The main barriers to this project's two sources of renewable energy are described below:

(a) Renewables-based power generation in South Africa: So far there are few renewable-based power generation in South Africa, though a few renewable energy power generation projects have been developed, with some form of financial assistance from official/bilateral funds or international carbon funds. The main barriers to such generation are as follows: (i) low current power tariff levels (an average tariff of 2.3 U.S. cents/kWh), well below the long-run marginal costs of expansion and costs of most renewable energy technologies in South Africa; (ii) lack of a policy and institutional framework for sale of power into the main grid; (iii) absence of readily available reliable basic information about renewable energy resources, (iv) potential developers' unfamiliarity with details of the government's approach for promoting renewable energy, as well as unfamiliarity with the nature and extent of support for renewable energy, and (v) inadequate capacity and knowledge in official agencies as well as private sector financial institutions that would finance renewable energy investments.

(b) Solar water heating: A nascent market has emerged in large-scale solar water heaters suitable for commercial establishments such as hotels, hospitals, old age homes, and rural fish farms. No official, bilateral, or international funds are involved in these transactions. The main barriers to scale-up are as follows: (i) lack of recognized industry best practices, standards, and codes; (ii) potential customer's unfamiliarity with the technology; and (iii) potential customers' unease at doing business with suppliers and vendors that are often viewed as lacking adequate stature and backing, given their small scale and recently established status.

Assessment of Availability of Commercial Funds for Overall Renewable Energy Development

17. An assessment has been made of the interest, awareness, capacity, and experience of South African financial organizations to finance the type of renewable energy investments required to meet the government's overall renewable energy target of 10,000 GWh per year. This assessment was based on the following:

- Discussions with three of the four largest banking groups in South Africa—Absa, FirstRand, and Standard; the relevant officials of the fourth major bank group, Nedcor, were not available at the time of the assessment mission
- Discussions with three specialized public sector development finance organizations (DFIs)—the Central Energy Fund, the Development Bank of Southern Africa (DBSA), and the Industrial Finance Corporation
- Reviews with each of these institutions of their arrangements, expectations, and issues for financing renewable energy investments of the type that would be expected to be supported

18. The main findings of the assessment are as follows:

- **Strong financial sector.** South Africa has a sophisticated, deep, and broad financial sector. The IMF has characterized the sector as sound and well regulated, and as having demonstrated, based on the 2001 experience, that it can handle sharp currency depreciations.
- **Strong interest in financing renewable energy projects.** The six finance organizations surveyed confirmed their interest in renewable energy investments. All are currently getting ready—in terms of organization, staffing, research, and marketing—to finance project investments for energy, including renewable energy. Energy is viewed as the “next big wave” in South Africa and the region by several financial institutions. The three banks have formed special energy units or have energy-specific staff capable of structuring competitive finance services for energy projects, including debt and assistance with equity placements. The three specialized finance organizations have particular interests and capabilities in the energy sector, including renewable energy.
- **Suitable financing packages can be made available.** The maximum debt sizes would not be limiting for renewable energy investments in South Africa, as these investments are relatively small by local standards. Tenure of debt of longer than seven years for the banks or ten years for the DFIs is a potential issue, although the South African financial sector has the capability to structure instruments for dealing with this. It is expected that the financial institutions will carefully scrutinize the quality of the power off-take agreements, particularly for the financial strength of the buyer.
- **Few renewable energy projects in the portfolio.** Renewable energy is a relatively new interest for South Africa’s financial sector. DBSA, for example, regards renewable energy as a potential area to provide debt financing. DBSA has a partnership agreement with the World Bank's Carbon Finance Unit for the identification of potential Clean Development Mechanism (CDM) project that might qualify for carbon finance. To date, the DBSA has approved debt financing for two renewable energy projects—a 4 MW Bethlehem Hydro project and a 4.2 MW Biotherm landfill-gas-to-energy project—both with carbon financing. DBSA also provided debt financing for the National Pilot Demonstration Darling Wind Farm project in the Western Cape region. The banks and DFIs expect that the renewable energy portfolio will grow, given the demand and the policy of attracting new sources of generation.

Annex 2: Major Related Projects Financed by the Bank and/or other Agencies South Africa – Renewable Energy Market Transformation Project

1. The Bank has not financed any energy projects in South Africa. The Bank has financed one ongoing carbon project: Durban Landfill Gas-To-Electricity Project (P080600). UNDP/GEF is currently supporting two energy projects: South Africa Wind Energy Project and Solar Water Heaters for Low-income Housing in Peri-Urban Areas. DANIDA has completed a Capacity Building in Energy Efficiency and Renewable Energy Project.

Annex 3: Results Framework and Monitoring
 South Africa – Renewable Energy Market Transformation Project

Project Development Objective	Outcome Indicators	Use of Result Information
<p>The project development objective is to establish policy and regulatory frameworks and build institutional capacity for renewable energy development in South Africa.</p> <p>The global environmental objective, in line with GEF Operational Program 6, is to remove the barriers to renewable energy technologies to help mitigate greenhouse gas emissions.</p>	<ul style="list-style-type: none"> • The policy and regulatory frameworks and institutional capacity required for meeting the government’s renewable energy target • An established CSWH industry • Increased renewable energy investment, contributing to government’s long-term renewable energy target of 10,000 GWh • CO₂ emissions avoided 	<p>Contribute to national target for renewable energy</p>
Intermediate Results	Outcome Indicators	Use of Result Information
<p>Renewable energy power generation Potential renewable energy promoters assisted with developing their investments</p>	<ul style="list-style-type: none"> • No. of companies assisted in a satisfactory manner, and no. of pre-feasibility studies prepared 	<p>Refine assistance provided</p>
<p>Commercial solar water heating Assist CSWH vendors</p>	<ul style="list-style-type: none"> • No. of CSWH systems installed • Fossil fuel-based power generation and CO₂ emissions avoided • No. of CSWH investments 	<p>Low levels will indicate need either to revise overall target or improve assistance</p>

Outcome Indicators	Baseline	Target Values (Accumulative)				Data Collection and Reporting		
		YR1	YR2	YR3	YR4	Frequency and Reports	Data Collection Instruments	Responsibility for Data Collection
REPG: 1. Government and electricity regulator prepared the legal, policy, and regulatory frameworks for grid-based renewable energy power, and submitted for government approval by December 31, 2009	No frameworks in place	Policy and regulatory frameworks under preparation	Policy and regulatory frameworks submitted for government approval	Policy and regulatory frameworks in effective	N/A	Quarterly reports	Progress reports from DBSA, NERSA, DME	ISU
2. Renewable energy resource database is available	Information on solar, biomass, hydro available	Gap identified. Site specific resource assessment conducted	renewable energy resource database developed and available to private developers					
3. 10-14 potential renewable energy power generation developers assisted, and 4-6 pre-feasibility studies prepared	Very few renewable energy projects by private developers	2-3 firms assisted, and 1 pre-feasibility studies conducted	4-6 firms assisted and 2-3 pre-feasibility studies conducted	7-10 firms assisted and 3-5 pre-feasibility studies conducted	10-14 firms assisted and 4-6 pre-feasibility studies conducted			
4. Knowledge about renewable energy increases in relevant official agencies and private sector financial institutions	Lack of renewable energy experience	Training, workshops, conducted	Training, workshops, conducted	Training, workshops, conducted	Training, workshops, conducted			

Outcome Indicators	Baseline	Target Values (Accumulative)				Data Collection and Reporting		
		YR1	YR2	YR3	YR4	Frequency and Reports	Data Collection Instruments	Responsibility for Data Collection
CSWH: 5.. Formulation of industry standards and codes	Limited standards in place	Work started	Standards and codes prepared	Standards and codes adopted		Quarterly reports	Progress reports from DBSA, DME	ISU
6. 200 CSWH systems installed	40 systems	60 systems	100 systems	150 systems	200 systems			
7. Power generation avoided	15 GWh	20 GWh	35 GWh	50 GWh	85 GWh			
8. Investments in CSWH systems	\$1.8 million	\$2.7 million	\$4.5 million	\$6.7 million	\$9.0 million			
9. CSWH CO2 emissions avoided	Survey at project launch	0.2 million tons	0.3 million tons	0.45 million tons	0.75 million tons			

Arrangements for Results Monitoring

- Institutional issues: The monitoring and evaluation will be carried out at the ground level by ISU, which is implementing the program, with oversight from DBSA and DME. Given the relatively new nature of the activities to be supported by this project, the early results from monitoring and evaluation will be critical in refining the nature of the support to be provided to various private sector participants.
- Data collection: This will be the responsibility of ISU. The costs of data collection are expected to be small relative to the size of the project.
- Capacity: The relevant institutions have adequate capacity to carry out this work.

Annex 4: Detailed Project Description

South Africa – Renewable Energy Market Transformation Project

1. The project has two components:
 - A. Renewables-based power generation in South Africa: Technical assistance (TA) and capacity building will eliminate the barriers identified above.
 - B. Commercial solar water heating: Focusing only on the commercial segment (which complements a UNDP-GEF project focused on the residential² segment), TA and capacity building will address the barriers identified above. In particular, a “participating CSWH company program” will be created that would enhance the companies’ credibility, as they would agree to observe the conditions of the program (including performance verifications of installed systems) in exchange for some performance-based grants for demonstrative subprojects in the initial stages of the project.

A. COMPONENT A. RENEWABLE ENERGY POWER GENERATION

2. For renewable energy power generation, the project will assist South Africa in the creation and/or strengthening of the organizations and institutions that would help the government meet its renewable energy target. The capacity areas include development of legal and policy frameworks, promotion, regulation, service provision, and monitoring and evaluation of renewable energy power generation. The agencies would cover DME, NERSA, and potential project sponsors and financiers.

Sub-Component 1. Policy and Regulatory Framework

3. This sub-component will develop legal, policy and regulatory framework, taking account of the experience with promoting grid-connected renewable energy power generation in both developed and developing countries, particularly the feed-in laws, renewable energy portfolio standards, and competitive tendering (see Annex 15 for details). The project will also adopt a mandated market policy that is appropriate for South Africa to achieve the renewable energy target and reduce costs. Currently, the South African government is contemplating to adopt a feed-in tariff scheme to promote renewable energy. This project will assist the government in developing a detailed design of the feed-in tariff policy and development of a draft Renewable Energy Law. It will include the following four sub-components:

² CSWH systems range in storage capacity 5,000 to 50,000 liters, whereas the capacity of residential systems is 200–300 liters. Some of the main end-users of CSWH systems include hotels, hostels, hospitals, fish farms, and flats/apartment blocks.

1.1 Review renewable energy policy instruments and financing mechanisms and recommendations for South Africa

4. This activity will review and summarize: (i) existing renewable energy policy instruments used around the world, particularly mandated market policies such as feed-in laws, renewable energy portfolio standards, and competitive tendering mechanisms; (ii) financial incentive policies such as grants, concessional loans, and tax credits; and (iii) financing mechanisms such as system benefit charges to cover the incremental costs between renewable energy and conventional energy. Then recommendations for adaptation of these policy instruments and financing mechanisms will be made. Specifically, this activity will update the DANIDA study on market rules for renewable energy.

1.2 Prepare South Africa legal and regulatory framework for renewable energy implementation

5. Based on the outputs from above, this activity will assist the Government of South Africa in developing legal, policy, and regulatory framework to promote renewable energy in order to achieve the 10,000 GWh renewable energy target set in the *White Paper*. The principles governing electricity market rules will help facilitate the sale of renewable energy power into the main grid.

6. The South African government is contemplating adoption of a feed-in tariff scheme for renewable energy. This activity will assist the government in preparing: (i) a Renewable Energy Law that mandates Eskom to purchase renewable energy power and adopts feed-in tariff policy for renewable energy; and (ii) a renewable energy regulatory framework for the regulator (NERSA) to set up feed-in tariff levels for different renewable energy technologies; develop sample PPAs; establish detailed implementation mechanisms for sharing the incremental costs between renewable energy and conventional energy across the national grid network; and linking the mandated market mechanisms with CDM. The detailed implementation regulation should also specify financial incentive policies, including subsidies on capital costs, tax credits, and concessional loans and guarantees; a streamlined approval procedure; the responsibilities of each agency in implementing the Renewable Energy Law; and how to count heating services such as solar water heaters to replace electricity towards the 10,000 GWh target.

1.3 Develop financing options for financing subsidies, including green premiums

7. This activity will help develop financing options, such as system benefit funds or voluntary consumer “green payments,” for financing the incremental costs between renewable energy power generation and conventional energy. The government is now piloting the green electricity scheme. This activity will help the government design detailed market rules for such a scheme.

1.4 Update resource-specific supply curves in terms of total (10,000 GWh) target, and specify corresponding green premium and financing requirements

8. This activity will update the supply curve analysis already undertaken by consultants, namely: (i) Conningarth Economists, June 2004, *Economic and Financial Analysis Due*

Diligence, Renewable Energy Market Transformation (REMT) Project, Report to the World Bank; and (ii) the cost-supply curve study by DANIDA. This will help the Government of South Africa select the least-cost renewable energy technology to achieve the renewable energy target.

Sub-Component 2. Capacity Building

9. This sub-component will carry out capacity building activities to strengthen the relevant public and private sector institutions, and to enable them meet the renewable energy power generation target. It will build capacity for government agencies such as DME and NERSA, as well as industries and financial institutions. It also will set up a Help Desk to provide advisory services and cost sharing matching grants for project developers to conduct pre-feasibility studies to facilitate private sector investment in renewable energy. The TA provided by this project is expected to leverage significant private sector funds. It will include the following three sub-components:

2.1 Capacity building for government agencies, industries, and financial institutions for renewable power generation

10. This activity will build capacity for (i) government agencies, particularly DME and NERSA, in renewable energy policy instruments, including selection of appropriate renewable energy policy for South Africa, lessons learned from design and implementation of renewable energy policies, development of regulatory frameworks for renewable energy particularly on mandatory purchase of renewable energy and tariff levels, and financing mechanisms to cover the incremental costs through training and workshops; (ii) renewable energy industry and enterprises to initiate, undertake and manage renewable energy projects; and (iii) financial institutions in evaluating and appraising renewable energy projects. This activity will involve traditional training, workshops, and consultant services.

2.2 Resource database development and dissemination

11. Information related to renewable energy resources is a public good; that is, there is little incentive for any single promoter to collect this information. Yet, this information is the base on which renewable energy power projects can be designed. This activity will: (i) compile existing renewable energy resource information from the DANIDA project, UNDP project, and other sources to develop a renewable energy database and mapping; (ii) disseminate this resource information together with technology information indicating feasible development options for the resources; and (iii) conduct site-specific resource measurement and assessment, if needed.

12. The promotional activities will be linked to the business-to-business help desk (below) as much of the promotion will be early-stage building of business capacity and early identification with investors and financial institutions of potential investment-grade projects.

13. The promotion will include the development of a Web site with links to comprehensive information on South Africa's renewable energy resources and development options. This will be part of the project's broader capacity-building strategy of widening the base of businesses,

professionals, and others that have access to relevant information on renewable energy opportunities.

2.3 Provision of Matching Grants

14. This activity will support a “help desk” to provide cost sharing matching grants and business-to-business advisory services to strengthen the capacity of the private sector to implement renewable energy Capacity Building Subprojects, in the following main areas: (i) facilitate activities leading to the financial closure of 10 to 14 investment projects; (ii) prepare to pre-feasibility level an additional 4 to 6 investments for possible financial closure in the year following project closing; and (iii) assist the promotion of off-grid renewables, including the related development of productive uses and “energy stores.” The help desk will assist project developers in promoting, identifying, preparing, and financing of renewable energy generation investment projects. The services would assist the project sponsors to identify, prepare, and finance renewable energy investments. Most of the capacity-building assistance to the private sector would be on a cost-share basis using matching grants, which are described in details in Section D. It is expected that a private sector project sponsor will develop each investment. The project sponsor will undertake the necessary technical, market, environmental/social safeguards, and other needed studies; prepare the financing package; and implement the project.

15. These services are targeted at investments that will be financed during the four years of the REMT project and others that would be financed during the initial year following project implementation. The focus will be on the provision of the upstream transaction identification support. South Africa has most of the capacities necessary to carry investments forward from this stage into detailed feasibility and implementation planning and closure, although specialist services would be available through these services as needed.

B. COMPONENT B. COMMERCIAL SOLAR WATER HEATING

16. The sub-component will provide TA and capacity building to professional, technical, and business groups in key market segments and companies engaged in selling CSWH systems and services. This project will not support any renewable energy resource other than CSWH. Nevertheless, CSWH companies are expected to contribute significantly towards the target of 10,000 GWh. There are two reasons for singling out CSWH for inclusion in this project. *First*, in contrast to other resources, this resource is near-commercial, and does not require significant subsidies. As such, it is suitable for GEF support aimed at reducing the barriers facing this resource. *Second*, most of the other resources are not near-commercial and require significantly larger subsidies to make them viable. However, they are suitable for sale of carbon emission reductions, the potential for which is shown by the ongoing discussions and progress already made in South Africa between interested buyers and sellers. In some cases, such sales may not be possible, and subsidies would have to be provided by the government, consumers, or some other source. It will include the following two sub-components:

Sub-Component 3. Capacity Building

3.1 Best practices, standards, promotion

17. The project will support activities to improve the CSWH practices in South Africa to international best practice levels. UNDP's Residential Solar Water Heating Project supports the sale and installation of solar water heaters at residences. The proposed project focuses on commercial solar water heaters only, and thus complements UNDP's project. In addition, the experience gained with developing codes, standards, and so forth in the UNDP project will be utilized in the proposed project.

18. Standards for SWH equipment are being improved under the UNDP supported project, and test equipment is being procured. The REMT project support will take into account the standards and testing progress achieved under the UNDP project and provide the additional support necessary to help improve industry and government arrangements to ensure international best practice levels of technology and services. This would include standardized ratings of equipment to facilitate comparisons of projected energy and cost savings and assistance to the industry to improve standards. Standards to be used in the project's participating CSWH company program would be no less than those applied in the UNDP supported domestic project. Equipment certified by international testing bodies acceptable to the Bank and the DME would also be eligible. The cost share matching grants and performance grants, described below, are market-based incentives for moving to best practice levels.

19. Based on experience from China, integrating solar water heaters in buildings can potentially penetrate a large market share and can substantially reduce GHG emissions. This activity will evaluate the feasibility of this approach in South Africa. If applicable, this activity can help develop model design of integration of solar water heaters in buildings, and assist in developing building standards and codes if necessary.

20. Marketing activities, including targeted public relations, information dissemination, workshops, and participation in key events will be conducted to increase awareness of CSWH. Promotional activities would be linked to the human resource capacity building and design and performance verifications and documentation.

21. There will be an aggressive program of short CSWH information and design workshops customized and targeted for professionals and technical specialists. The workshops will increase CSWH knowledge among architects, developers and builders, financial specialists, installers, hotel and other facilities managers, owners, and others. These workshops will cover best practices for incorporating CSWH in new and retrofit applications. The capacity building will also take into account the Black Economic Empowerment (BEE) opportunities that the sector offers throughout the CSWH value chain.

3.2 Provision of Matching Grants and Performance Grants

22. This activity will provide matching grants and performance grants to support the development of South Africa's nascent solar water heating industry by promoting the installation of systems for commercial, institutional, and industrial applications. The target would be the small- and medium-scale CSWH segments. The project would support capacity-building activities for market development that improve the quality and product credibility of CSWH

equipment and installations, and thus raise confidence in the technology's cost savings opportunities.

23. A focus of the work is to facilitate the development of 10 or more sustainable private enterprises selling and installing quality CSWH to hospitals, schools, hotels, and other commercial, industrial, and institutional users of hot water. As of late 2004 there were an estimated five companies selling CSWH products and services at a low level with, in most cases, only occasional sales of CSWH systems; for all of these the CSWH portion of their business was small and recent. In mid-2004, a CSWH system was installed on a retirement home on an energy services basis, apparently the first use of an energy service company (ESCO) model on a fully commercial basis. Sales and installations supported under the project will be on a competitive, market-driven basis.

24. CSWH companies that meet minimum standards of design, equipment, installation, after sales service, and customer relations will be considered eligible to participate in a "participating CSWH company program." Business development support for capacity-building activities will be provided to participating companies on a cost share basis through matching grants. Performance grants will be available for capacity building based on the installations of systems that are demonstrative or path-breaking. The participating companies will agree to meet the program's code of conduct requiring the use of best practice designs, equipment, and installations and that follow transparent and credible business practices in dealing with customers; companies will also risk suspension in case of noncompliance. These activities will improve significantly the companies' status and make them more credible to their potential customers and lenders.

25. The initial designs of proposed installations by participating CSWH companies will be independently vetted by specialists, if requested by the company, to motivate sales. Providing potential customers with independent professional assessments will contribute to building confidence in the market. The design verifications will contribute to capacity building.

26. The initial two or three CSWH demonstrative installations in each subsector (for example, retirement homes, hotels, correctional facilities, fish farms, mining hostels) supported by capacity-building performance grants will be fitted with standard data loggers. Performance will be monitored independently, with a view to developing authoritative South African documentation that can be used by participating CSWH companies in their marketing and by project-supported capacity-building activities. It is expected that there would be documented, promotional profiles of up to five investments with performance data available within 18 months.

27. The capacity building supported by REMT through matching and performance grants will be demand driven. In addition, the program will assist the participating CSWH companies in a variety of ways on a as-needed basis. This support will include getting certifications that companies' equipment meets standards, independent installation and performance verifications to increase customer confidence, and possibly equipment performance guarantees in case this should be needed initially. Section D outlines detailed description of matching grants and performance grants.

C. Implementation Support to Components A and B

28. The specific activities to be supported are as follows:

4.1 Due diligence on specific projects supported by the government

29. This activity will develop and pilot DME's green premium payment intermediation, including due diligence and approval/payment procedures. The intermediation will be assisted by a team led by DME with members drawn from IDC, DBSA, DEAT, as well as private sector and financial sector representatives. Independent and professional due diligence assistance will be provided by consultants under contract with DBSA through the ISU. Financial models will be developed for conducting independent analyses of developers' proposals.

4.2 Monitoring and evaluation and mid-term review of feasibility of total target

30. This activity will support DME's monitoring and evaluation of the project by putting a comprehensive monitoring and evaluation scheme in place. This scheme will address a number of issues: (i) project and off-project performance indicators, including overall monitoring of the 10,000 GWh target; (ii) the overall progress of the CSWH component; and (iii) monitoring of the performance and disbursements of GEF and government funds.

31. This activity will compile and update a database of renewable energy development status, including the status of enforcement, installed capacity of renewable energy, costs and tariff of renewable energy, renewable energy effectiveness and impacts, and so forth.

32. Independent and professional assistance will be provided by consultants under contract with DBSA, who will be responsible for ensuring that an appropriate monitoring and evaluation scheme is in place. The scheme will be built around the project indicators.

4.3 Project coordination and implementation

33. This activity will support program coordination and management, financial management, information activities, and coordinated monitoring and evaluation for both components. The project activities cover a fairly broad spectrum of policy, capacity-building, and TA activities with concerns for policy development, investment, and commercialization, and will involve a large number of actors in business, finance, government, professional and civil society groups.

34. A project coordinator will head up the ISU at the DBSA and directly contributing to development of the policy and institutional frameworks. The project coordinator and the ISU will conduct the overall management function, including responding to the authorities (the Project SC, DME, the World Bank) and interfacing with stakeholders. The project coordinator and the ISU will be responsible for project planning, implementation, financial management, and reporting. Through its REMT Web site and through its handling of the REMT-supported workshops, conference participations, media events and other information activities, the project coordinator and the ISU will ensure that REMT contributes strongly to renewable energy

development in South Africa. In addition, DBSA charges a 5 percent management fee to implement this project.

D. IMPLEMENTATION GUIDELINES FOR GRANTS

35. The project provides two types of grants:

- **Matching grants (MG) for capacity-building subprojects.** The objective of these grants, which are open to participating CSWH companies and other organizations in renewable energy power generation and CSWH, is to assist the beneficiaries to identify, prepare, and finance investments and improve their business and market development capabilities. A MG reimburses a portion of the total costs of a capacity-building activity undertaken by the beneficiary. The range of possible capacity-building activities is wide, and could include, for example, a consultant study, a workshop, the preparation of marketing materials, and promotional campaigns. Disbursements are against documentation and verification of completion of agreed milestones (such as satisfactory consultant report received or training workshop completed) and subject to satisfactory documentation and verification of expenditures. Capacity-building subprojects for CSWH companies that cover the independent documentation of the design, installation, and performance of a CSWH system, so as to prepare materials suitable for use in the broader promotion of the technology, will be eligible for MG support to share costs related to consultant services. The GEF Grant will finance only consultants' services under the Matching Grants.
- **Performance grants (PG) for CSWH subprojects.** The objective of these grants, which are limited to CSWH companies, is to support capacity-building subprojects covering the design, installation, or improvement, monitoring and documentation of demonstrative CSWH systems. A PG would be for a specific amount that would be an estimated percent of the total cost of the activities. It would be disbursed against documentation and verification of completion of agreed milestones related to the completion of the subproject (for example, 50 percent upon commissioning of a system; 50 percent upon confirmation of satisfactory operation, monitoring and documentation after six months). The GEF Grant will finance only consultants' services and goods under the Performance Grants.

36. This document establishes the basic guidelines to be followed by the ISU in managing the matching and performance grants. The ISU will issue forms, standard agreements, and additional implementation instructions as may be necessary for the management of the support. The ISU will develop detailed rules and procedures for evaluating and assessing proposals submitted for subprojects to be financed through MG and PG acceptable to the Bank, prior to the disbursement of MG and PG sub-components.

(a) Eligible Recipients

Matching grants

- Private companies registered and operating in South Africa that are engaged in businesses related to renewable energy power generation or CSWH are eligible. This may include individuals and firms that are conducting pre-investment activities related to renewable energy power generation or CSWH.
- Private organizations engaged in activities related to the development of renewable energy power generation or CSWH are also eligible.

Performance grants

- Private companies registered and operating in South Africa engaged in CSWH investments that meet minimum standards (to be specified by the ISU) of design, equipment and installation, after-sales service, and customer relations.

(b) Eligible Activities

Matching grants

- Market, business, or investment project development and improvement activities, including the following: site and market assessments, customer surveys, feasibility studies, business plan preparation, financial or other systems development, staff or other training, design and production of promotional materials, marketing and advertising, participation in promotional events, and other capacity-building activities
- Product development, including improvement in the product process, quality control, inspection, and ISO or other certification

Performance grants

- Capacity-building activities that include installation or improvement of a CSWH system that results in a demonstrative output that would improve the CSWH product technology credibility in the market and benefit the development of the CSWH sector.

(c) Eligible Expenditures to be Cost Shared

Matching grants

37. Matching grants may be given for expenditures for consultants' services under contracts procured in accordance with the GEF Grant Agreement, including the following:

- Costs of services of independent, nonrelated consultants or firms, including their travel and travel-related costs and direct expenses in providing services under their Terms of Reference
- Costs of services for design of services or materials (for example, for training or promotions) and manuals
- Fees and other costs for inspections for ISO or other certifications
- Fees and other costs of participating in marketing events
- Costs associated with capacity building and training activities, and customer and market surveys
- Fees and other costs associated with documentation of performance of the activities supported by the matching grants

Performance grants

- Expenditures of consultants' services and goods associated with an approved CSWH subproject

(d) Ineligible Expenditures

38. Any expenditure other than consultants' services, including:

- Salaries of staff or long-term consultants of the proponent/company
- Expenses of staff of the company, including honoraria for attending training courses, exhibitions, and so forth.
- Salaries and expenses of government, including provincial government officials
- Expenses associated with routine business activities

(e) Evaluation Criteria

39. The proposals for grants will be evaluated according to the following criteria:

- The activities proposed for assistance are well targeted and consistent with the company's development needs and strategy. For instance, the activities would be included within the company's market, business, or product development plan, or within an analysis of the company's strengths and weaknesses, or be identified during an ISU or other professional review of the company's capacity building requirements.
- The need, the activity, and the assistance are clearly all described.
- The implementation arrangements and schedule are feasible and likely to be effective.
- Deliverables are clearly defined and easily verifiable by the ISU.
- Outcomes are defined in a form that can be objectively monitored. The proponent will specify in the proposal a level of outcome achievement the accomplishment of which would mean that the company is very satisfied with the outcome of the supported activity and assistance.
- If a consultant is proposed, the terms of reference are satisfactory (including tasks, schedule, deliverables, and budget) and the proposed consultant is well suited to the

assignment. Any fees being charged must be broadly in line with market realities, and overcharging is to be strictly avoided.

- The budget is sufficiently detailed and reasonable.
- The proposal achieves a minimum score of 80 percent against the criteria listed below.

Table A.4.2: Proposal Evaluation Criteria

Criteria	Weights (%)
• Relevance of proposal to company’s market, business, or product/process development plan and identification of need for the proposed work	25
• Relevance of the proposed activity to the development of renewable energy power generation or CSWH in South Africa	25
• Qualification of consultants and other participants, or event to be attended	25
• Clarity and adequacy of the implementation plan and likelihood of successful implementation given the proponent’s capabilities and the proposed activities, schedule, budget, and management arrangements	25

40. The evaluation of requests by the ISU will also consider the following:

- Group activities. For matching grants, group activities covering more than one eligible company (for instance, those sponsored by an association) may be supported. Applications will be evaluated separately for each eligible company. In particular, each company that is supported will match by 50 percent the costs of providing the group-based assistance to that particular company.
- Avoiding double subsidies. Grant support will not be provided to match contributions from public sources or other subsidies. In such cases, the level of assistance will be calculated so that the total subsidy element from all sources external to the companies for the particular activity does not exceed 50 percent.
- Supplier selection. The choice of suppliers will be made by the company and will not be restricted to suppliers already in contact with the ISU. However, the ISU will satisfy itself as to the supplier’s competence for the task intended; that there is a genuine, arms-length commercial relationship between the supplier and the company; and that the company is following good commercial practice in its purchasing.

(f) Maximum Support and Cost Share Levels

Matching grants

41. The maximum amount of MG support is as follows. For capacity-building subprojects related to renewable energy generation, the maximum aggregate amount per company is the equivalent of US\$100,000 over the course of the REMT project. For capacity-building subprojects related to CSWH, the maximum amount per company is the equivalent of US\$50,000 over the course of the project.

42. The support provided by a MG can be used to reimburse up to a maximum of 50 percent of eligible expenditures.

Performance grants

43. The maximum aggregate amount of PG support per CSWH company is expected to be US\$50,000 over the course of the REMT project.

44. Exceptions to the maximum support level per company and the maximum amount of eligible costs to be reimbursed may be made with the approval of the SC and “no objection” from the World Bank.

(g) Approval and Rejection

Matching and performance grants

45. To apply for MG and PG support, eligible companies and organizations submit proposals to the ISU at the DBSA. The ISU will issue standard forms for this purpose.

46. The ISU will evaluate the proposal and inform the proponent of the result within 30 working days after receipt. The ISU will establish internal procedures, which will be approved by the SC, for its evaluations and approvals of MG and PG proposals.

47. The first MG award for each company will require the prior approval of the SC and “no objection” of the World Bank. Subsequent MG awards will be subject to post review by the SC and the World Bank. The ISU will seek the prior concurrence of the SC and the “no objection” of the World Bank for the approval of any MG proposal that it considers raises potential issues with regard to eligibility or evaluation.

48. Each PG award by the ISU will require the prior approval of the SC and “no objection” of the World Bank.

49. Any rejections are to be discussed by the ISU with the proponent, to give an opportunity for identification of possible next steps. The intention is to give each company maximum opportunity and assistance required to benefit from the MG and PG facilities of the project. All

rejection notifications to companies will be in writing. The ISU will report to the SC on rejected applications.

(h) Processing of Approved Grant Applications

Matching and performance grant agreements

50. On receiving approval of its proposal, each company will be required to sign an MG or PG Agreement with the ISU, which will define the contractual obligations and rights of each party. The ISU will develop standard MG and PG Agreements, which will be approved by the SC and receive the “no objection” of the World Bank, that will bind the company to present defined deliverables for viewing by the ISU. All outputs from the supported activities will remain the exclusive property of the company or organization, with commercial confidentiality fully preserved. ISU staff and consultants will respect the commercial confidentiality of all deliverables, outputs, and information supplied during contact with the company or organization.

51. The MG and PG Agreements will require the beneficiary company or organization to undertake the following:

- carry out the subproject with due diligence and efficiency and in accordance with sound technical, financial, managerial, and environmental standards and to maintain adequate records
- obtain services or goods to be co-financed out with the grant at a reasonable price using good commercial practices, account being taken also of other relevant factors such as quality and the competence of the suppliers
- provide all information that the ISU, DME, or the Bank may reasonably request relating to the subproject and to the related administration, operations, and financial condition of the beneficiary company or organization

52. The MG and PG Agreements will also stipulate that the ISU may suspend or terminate a Matching Grant Agreement or Performance Grant Agreement in case of failure by the beneficiary to comply with the terms of the Agreement or for engaging in corrupt, fraudulent, collusive, or coercive practices. A MG or PG Agreement may be suspended or terminated with the agreement of the SC and the “no objection” of the World Bank.

(i) Disbursements and Company Reports

Matching and performance grants

53. After signing a MG or PG Agreement, the ISU may pay the company or organization an advance of up to 50 percent of the agreed level of support, subject to any conditions that the ISU may specify. After the assistance is completed, the company or organization can request payment of the balance of the support, submitting a completion report and evidence of eligible

expenditures and agreed deliverables. If the ISU determines that the work has been performed satisfactorily, it will pay the company or organization the balance amount.

54. The company or organization must substantiate all claims for reimbursement for eligible expenditures. The ISU will verify that expenditures have indeed been made. The company must retain the documentation and deliverables for three years after receipt of the matching grant or performance grant assistance for possible inspection by auditors, the ISU, or Bank supervision missions.

(j) Mitigation of Fraudulent and Corrupt Practices

55. The implementation manual for matching and performance grants should include adequate control and oversight mechanisms as well as legal remedies to mitigate fraudulent and corrupt practices, such as the following:

- inflated or duplicated claims
- fraudulent claims
- unjustified expense claims
- conflicts of interest (for example, grant recipients awarding consulting and other contracts to their own staff and/or own subsidiaries/affiliates)
- approving grant proposals prepared by staff of the Implementing Agency

Annex 5: Project Costs

South Africa – Renewable Energy Market Transformation Project

1. The project costs by activity have been shown in Tables A.5.1 and A.5.2; these include contingencies.

Table A.5.1: Project Components and Financing Plan				
Component	Cost Estimates (US\$ million)	Financing Plan (US\$ million)		
		GEF	Government ¹	Private/Banks ²
Renewable energy power generation	5.75	4.05	1.70	0.00
CSWH*	10.70	1.40	0.30	9.00
Project Management Cost	0.85	0.55	0.30	
Total	17.30	6.00	2.30	9.00
<p>1. The Government of South Africa will provide \$2.30 million co-funding from the government's Renewable Energy Subsidy Fund, Renewable Energy Directorate budget, and in-kind contribution, over the Project implementation period.</p> <p>2. This project is expected to leverage \$ 9.00 million from the private sector for investment in CSWH systems sold under this project. As such, this leveraged fund cannot be committed in the same manner as Government or donor funds. However, unlike in many other countries, South Africa's financial markets have the required motivation and capability to provide funds of this magnitude.</p>				

Table A.5.2: Technical Assistance, Capacity Building, and Implementation Support			
	<i>Funding source (US\$)</i>		
	Government/ private	GEF	Total
Component A. Renewable Energy Power Generation			
1. Policy and regulatory framework			
1.1 Review renewable energy policy instruments and financing mechanisms, and recommendations for South Africa	25,000	50,000	75,000
1.2 Develop legal, policy, and regulatory framework of mandated market policy for renewable energy implementation	200,000	1,000,000	1,200,000
1.3 Develop financing mechanisms, including voluntary green premiums	100,000	300,000	400,000
1.4 Update resource-specific supply curves in terms of total (10,000GWh) target, and corresponding green premium and financing requirements	100,000	100,000	200,000
2. Capacity building			
2.1 Capacity building for government agencies (DME & NERSA), industries, and financial institutions	200,000	500,000	700,000
2.2 Resource information development and dissemination; program promotion	325,000	450,000	775,000
2.3 "Help Desk" (advisory services and matching grants) to guide renewable power project developers, including for off-grid renewable energy	350,000	1,300,000	1,650,000
Component B. Commercial Solar Water Heating			
3. Capacity building			
3.1 Best practices, standards, promotion	100,000	400,000	500,000
3.2 Establish and operate "participating CSWH company program"* (matching grant and performance grant)	9,200,000	1,000,000	10,200,000
Implementation support for Components A and B			
4. Implementation support			
4.1 Due diligence on specific projects supported by Government	200,000	150,000	350,000
4.2 Monitoring and evaluation, and mid-term review	200,000	200,000	400,000
4.3 DBSA and ISU project coordination and implementation	300,000	550,000	850,000
Total	11,300,000	6,000,000	17,300,000
* The leveraged fund of US\$ 9.0 million under item 3.2 is the estimated cost of the equipment to be installed by the CSWH companies under this project.			

Annex 6: Implementation Arrangements

South Africa – Renewable Energy Market Transformation Project

1. DME has designated DBSA as the implementing agent for this project. This annex describes: (a) DBSA; (b) the Project Steering Committee; (c) the Implementation Support Unit; (d) stakeholders participation; (e) flow of funds; and (f) coordination with ongoing activities.

A. DBSA

2. DBSA will be the implementing agent for this project. An MoU will be entered into between DME and DBSA that spells out the overall implementation arrangements under which DBSA will act as the implementing agent of DME. Furthermore, for the purposes of carrying out the agreed activities in the MoU, DBSA would be contracted by DME pursuant to Bank guidelines under a contract for services.

3. DBSA is a well-established agency that has considerable expertise in both financing and managing development projects. In recent years, DBSA has taken an interest in promoting renewable energy investments. DBSA is familiar with World Bank procedures and does not face constraints in areas such as financial management and procurement. Although DBSA does not have extensive in-house capacity on renewable energy, this is not a constraint as DBSA will set up an ISU and hire (mainly local) consultants in implementing this project.

B. Project Steering Committee

4. A Steering Committee (SC) to be appointed by DME will oversee the project. The SC will be responsible for monitoring project implementation and identifying actions to ensure that it proceeds in a timely and efficient manner. The SC will consist of five members: (i) the Deputy Director General of Hydrocarbon, Energy Planning, and Clean Energy, DME as its Chair; (ii) the Chief Director, Clean Energy, DME; (iii) the Director, New and Renewable Energy, DME; (iv) the National Energy Regulator of South Africa (NERSA); and (v) the Central Energy Fund (CEF). The SC will meet at least twice every year. The SC may also expand to include technical expert(s) in renewable energy and private sector representative(s), as required.

5. The SC will provide overall advice and guidance to the project, and ensure recommendations made by the project will be incorporated in policy and regulatory frameworks and implemented. The SC will facilitate good coordination between the different agencies involved in scaling-up renewable energy implementation. The SC shall discuss and approve progress reports, changes in project implementation, and other items as may be requested by the DME. The SC shall monitor that proper quality assurance of the outputs is carried out by the Renewable Energy Market Transformation (REMT) project staff. The SC will guide and follow the development of the project according to the implementation schedule, and cause periodic progress reports to be submitted, including use of funds, to the Bank and DME.

6. The SC will form a working group of designated staff to provide close supervision and guidance to the project team during implementation. The SC may also decide to establish an

advisory board or use other mechanisms to present and share ideas and to otherwise involve key external stakeholders in the implementation process. The stakeholders will include different sections within the renewable energy power generation and CSWH communities (for example, consumers, academic, finance, consulting engineers, NGOs, project developers/owners, and Eskom).

C. Implementation Support Unit

7. The DBSA will establish an ISU to manage day-to-day activities during the four years of the REMT project implementation. The ISU will be responsible for carrying out the various project activities—that is, the policy and institutional framework, capacity building, and implementation activities. As such the ISU will also be handling quality assurance and progress reporting. The ISU will also be responsible for administering the performance grants for CSWH subprojects and the matching grants for renewable energy and CSWH capacity-building activities. The private sector will be responsible for implementing all the investments supported under this project.

8. The ISU will be headed by an international Project Coordinator, who will lead the implementation activities of the REMT project and will be responsible for the substantive work for renewable energy policy and institutional framework development and capacity building. In addition, the ISU will also consist of a business support manager, who will be a national consultant and is responsible for implementing the Help Desk to guide project developers for both renewable energy power generation and CSWH, and one support staff. Existing DME staff will be allocated to provide close supervision and guidance to the project team during implementation. Short-term consultants and advisors will provide services on an as-needed basis.

9. The Agencies Unit within DBSA is responsible for procurement, financial management, disbursement, budgeting, accounting, treasury services, and corporate services such as human resources management, legal advisory services, and so forth.

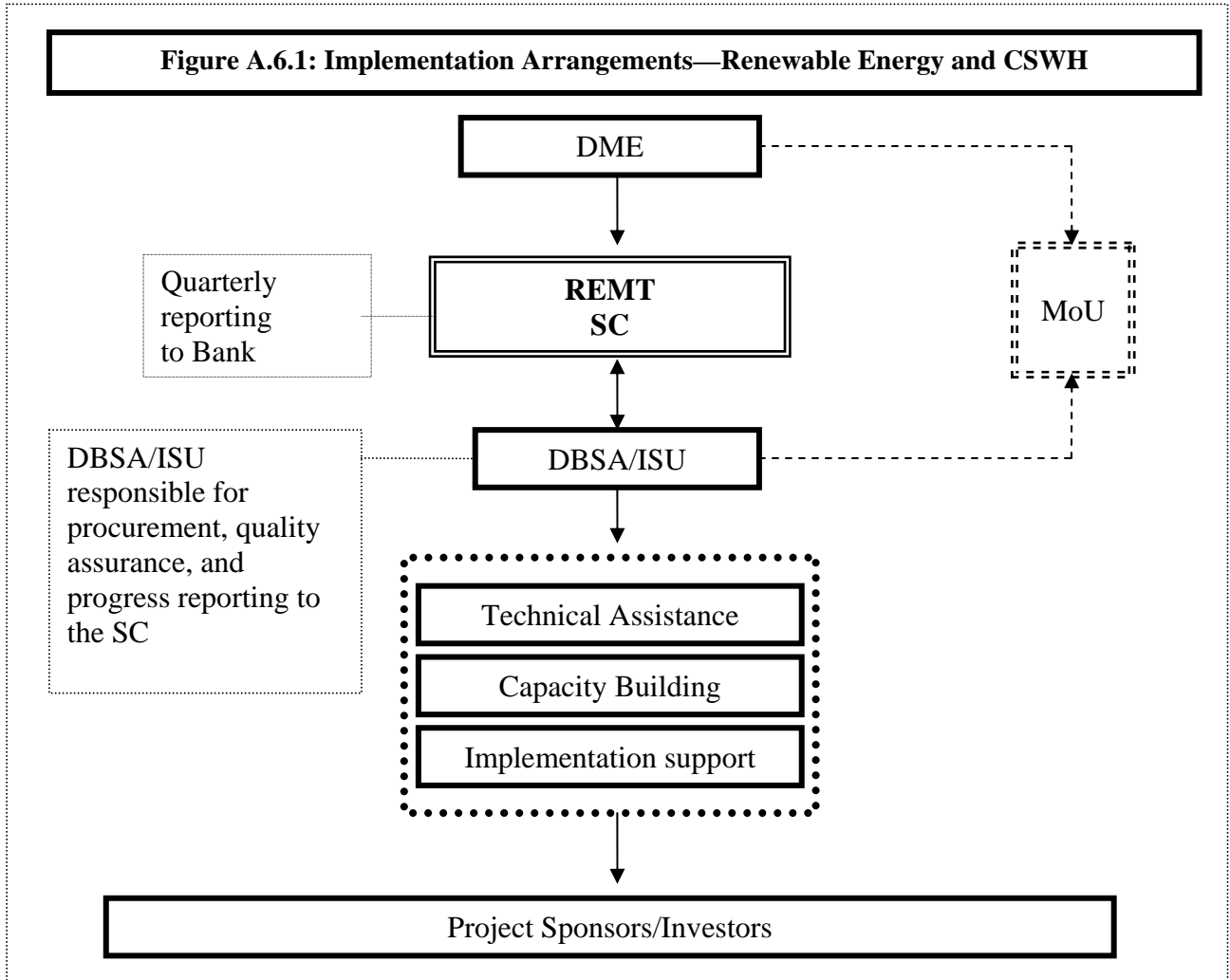
D. Stakeholders Participation

10. The direct stakeholders involved in this project are as follows:

- DME: overall responsibility for this project
- NERSA: responsible for regulating the power sector, and will be assisted by the project in formulating the rules by which independent power producers (including renewable energy based generators) will sell power into the main grid
- CEF: mandated to engage in acquisition, exploration, generation, marketing, and distribution of any energy form and engage in research in the energy sector
- DBSA: implement the project on a day-to-day basis
- CSWH companies: will be assisted by the project
- Professional, technical, and business groups: will receive capacity building under the project
- Potential and actual buyers and financiers of CSWH systems: will receive information under the project

- Potential renewable energy generation developers: will be assisted by the project in developing their plans

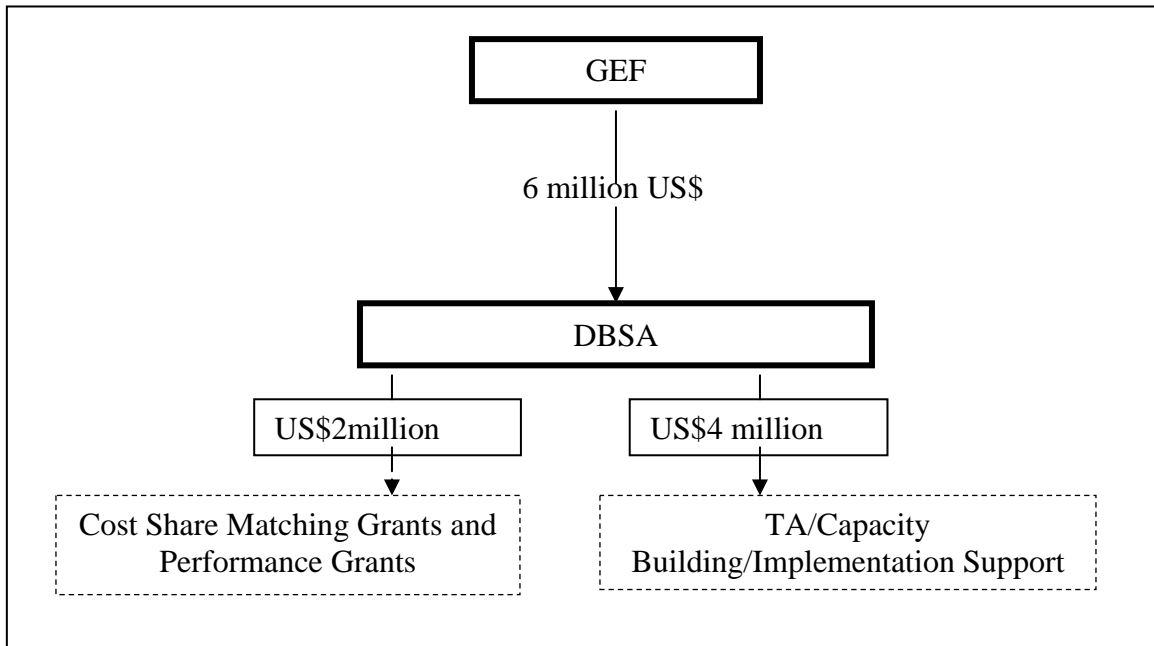
11. The relations between the different stakeholders are shown in the figure A.6.1 below.



E. Flow of Funds

12. A designated account will be set up at the Standard Bank by DBSA, which will be responsible for the disbursements and requests for replenishments from the World Bank.

Figure A.6.2: Flow of Funds



F. Coordination with Ongoing Activities

13. This set of activities will facilitate the creation of a detailed framework for sale and wheeling of renewable energy power into the main grid. These efforts will build on the work being undertaken by UNDP (under the GEF-financed South Africa Wind Energy Project—SAWEP) and DANIDA. It is expected that the detailed framework will be finalized during the course of this project, and investments undertaken during this project will be able to utilize the framework.

14. SAWEP focuses only on wind power. The project has six components, of which three are particularly relevant to this project:

- *Green power funding.* To assist initiatives geared towards green power marketing and setting up and implementing Tradable Renewable Energy Certificates as well as implementing a green power guarantee scheme.
- *Long-term policy and implementation framework for wind energy.* To assist the Government of South Africa with the development of a long-term policy, including implementation strategy, for wind energy development.
- *Capacity building and institutional strengthening.* To strengthen and support stakeholders involved in wind energy development, including key government departments (for example, national and provincial environmental departments), public agencies (such as financing), the wind farm industry (such as the South African Wind Energy Association), and independent private firms.

15. It has been agreed with UNDP that this project will be coordinated with SAWEP (and UNDP's Residential Solar Water Heating [REMT] project) according to the following principles:

- There will be high-level coordination between the Task Managers. Specifically, (i) the Bank mission will meet with UNDP on every visit to South Africa, and (ii) the UNDP and Bank Task Managers will be in touch with each other by phone or e-mail on key issues. This coordination will be open-ended; that is, the Task Managers will discuss coordination issues as they arise, and make suitable adjustments as needed. This has already been done in the past, and will continue.
- There will be coordination in design. Specifically, this project will determine its detailed tasks—the TORs for specific TA components—with reference to the UNDP SAWEP TORs. The purpose is to take advantage of synergies and avoid duplication. This will be close-ended coordination. There will be an initial “synchronization” of REMT TORs with SAWEP TORs, followed by an exchange of e-mails on a regular basis (say four times a year) to ensure coordination over time on key areas. A similar arrangement will be made for the CSWH Component of the REMT project, with the coordination focus mainly on standards and certifications.
- There will be coordination in implementation without imposing a coordination burden. Specifically, the REMT and UNDP project implementers will use formal and informal opportunities and occasions to meet each other and discuss coordination issues, but each group will be free to pursue its activities without waiting for approval from the other. Formal opportunities are the existing SAWEP and SWH Steering Committees, to which the REMT implementers will be invited (as per agreement with UNDP) as soon as REMT becomes effective. This coordination will be facilitated in practice by the similar implementation arrangements in the Bank and UNDP projects.

Annex 7: Financial Management and Disbursement Arrangements

South Africa – Renewable Energy Market Transformation Project

A. SUMMARY OF THE FINANCIAL MANAGEMENT ASSESSMENT

Country Risk

1. No Country Financial Accountability Assessment (CFAA) has been carried out on South Africa to date. However, it is generally accepted that the country has one of the more developed accounting professions in the world, and is certainly amongst the more technically capable countries in the region. However, experience of Bank-financed projects is not widely available, although to the project's advantage, DBSA is familiar with World Bank procedures.

2. The country has a good reservoir of qualified accounting professionals and as a middle-income country has an adequately staffed Audit Office. In addition, where time is of the essence, the Auditor General is allowed, by legislation, to outsource some of the work. The Auditor General's Office has already produced several annual audit reports, satisfactory to the Bank.

Project Risks

3. The DBSA is a well-established agency that has considerable expertise in both financing and managing development projects. This is an advantage in that the project will be handled by a very experienced project management organization. The potential disadvantage of competing projects has been mitigated by the existence of the ISU, a small unit within DBSA that is dedicated to the management of the project.

Financial Management Strengths and Weaknesses

Strengths

4. Project financial management will be overseen by the existing DBSA Finance Department. The ISU will be responsible for receiving and reviewing the completeness and appropriateness of invoices and other requests for payment. The actual capturing and settlement of those invoices will be made by and through the existing DBSA payments system. While the DBSA has its own existing "Administrative and Accounting Procedures Manual," a small update has to be made to this to incorporate the new positions at the ISU, and how they relate to existing DBSA structures. The production of this enhanced "Administrative and Accounting Procedures Manual" will be circulated to the Bank for comment.

Weaknesses

5. There are no known weaknesses.

Financial Management System and Reporting

Organizational structure

6. An ISU will be established specifically for the management of the project, and will conduct day-to-day management of project operations. In addition to a Coordinator, the ISU will be supported by the Finance/Procurement Specialist from DBSA.

“Administrative and Accounting Procedures Manual”

7. Project financial management will be based on the existing DBSA financial management system. The DBSA already has a comprehensive “Administrative and Accounting Procedures Manual.” The manual will need to be revised to incorporate the new ISU’s activities, and to elaborate on the flow of GEF funding.

Accounting system

8. The accounting system for the proposed project will be based on computerized systems at the DBSA. Systems objectives will include the following:

- proper recording of assets, liabilities, revenues (where applicable), and expenditures of the project
- providing accurate and timely management information
- providing timely and accurate information for use by other stakeholders in the formats that they require
- supporting the preparation of statutory and other audits

9. The accounting systems must support the general principles of equity, economy, efficiency, and effectiveness. With regards to the Bank’s requirements, DBSA will coordinate and collate the quarterly progress reports. These reports must be able to support the production of quarterly internal financial reports (IFRs) that integrate project accounting, procurement, contract management, disbursement, and physical progress of activities on the ground.

Reporting (IFRs)

10. Formats of the various periodic IFRs, to be generated from the financial management system, have been developed to provide quality and timely information to project management and various stakeholders on project performance.

11. The following minimum quarterly IFRs will be produced:

- financial reports
- sources and uses of funds by activity and component
- designated account reconciliation
- physical progress report
- procurement monitoring report

12. The scope, content, and format of these reports have been discussed with DBSA.

Project financial statements

13. The Grant Agreement will require the submission of audited financial statements to the Bank within six months after the financial year-end. The financial statements will consist of:

- A *Statement of Sources and Uses of Funds* that recognizes all cash receipts, cash payments, and cash balances controlled by the project.
- The *Designated Account Reconciliation*.
- The *Accounting Policies Adopted and Explanatory Notes*. The explanatory notes should be presented in a systematic manner with items on the *Statement of Sources and Uses* being cross-referenced to any related information in the notes. Examples of this information include:
 - a summary of fixed assets by category of assets
 - copy of IFRs
 - a *Management Assertion* that Bank funds have been expended in accordance with the intended purposes as specified in the relevant World Bank legal agreement.

B. AUDIT ARRANGEMENTS

Internal Audit

14. DBSA has an in-house internal audit department.

External Audit

15. For the ISU at DBSA, the external audit will be carried out annually by the Controller and Auditor General (CAG). The external audit will cover all GEF trust fund grants and counterpart funds at all levels of project execution. The auditor will be required to express an opinion on the audited project financial statements only, in compliance with International Standards on Auditing (IFAC/INTOSAI pronouncements), and submit the audit report within six months of the end of the financial year. In addition, detailed management letters containing the auditor's assessment of the internal controls, accounting system and compliance with financial covenants in the Grant Agreement, and suggestions for improvement will be prepared and submitted to management for follow-up. While the Bank is satisfied with the Auditor General Standards, the agreed audit terms of reference will need to be reviewed for compliance with the requirements of the Bank.

Supervision

16. Financial management supervision will be carried out regularly by the Financial Management Specialist (FMS) at least once a year.

17. The FMS will:

- conduct a financial management supervision shortly after project effectiveness
- review the annual Audit Reports and Management Letters from the external auditors and follow up on material accountability issues by engaging with the Task Team Leader, Client, and/or Auditors.

C. DISBURSEMENT ARRANGEMENTS

18. The proposed GEF Trust Fund Grant of US\$6.0 million would be disbursed over four years from FY 2008 through FY 2011. The annual estimated disbursements are indicated on the first page of the Project Appraisal Document. The proposed allocation of grant proceeds is shown in table A.7.1.

Table A.7.1: Allocation of Grant Proceeds

Expenditure category	Amount in US\$ million	Financing percentage
(1) Consultants' services (under matching grants)	1.75	100% of foreign expenditures 83% of local expenditures
(2) Consultants' services and goods (under performance grants)	0.25	100% of foreign expenditures 83% of local expenditures
(3) Other consultants' services	3.25	100% of foreign expenditures 83% of local expenditures
(4) Training and workshops	0.25	100%
(5) Unallocated	0.50	
Total GEF grant allocated	6.00	

19. The flow of funds arrangements for the project will entail the operation of the following bank accounts:

GEF funds: A rand-denominated Designated Account will be operated by the counterpart and held at the Standard Bank. The Bank will disburse an initial advance from the proceeds of the Grant into the DBSA Designated Account. Replenishment will be through submission of IFRs.

Counterpart funds will be allocated through the entities' normal budget processes. Details of the necessary authorizations and the bank account signatories should be documented as part of an "Administrative and Accounting Procedures Manual" to be prepared by the ISU.

20. Disbursements from the Grant will be made on the basis of reports, which shall include the IFR and any other Bank-specified information (Report-based Disbursements). In the case of the first such request submitted to the Bank before any withdrawal has been made from the Designated Account, the submission shall only include a statement with the projected sources and applications of funds for the project for the six-month period following the date of such request.

21. Where necessary, the direct payment method, involving direct payments from the Designated Account to third parties for services, may be utilized upon the recipient's request. The Bank's Disbursement Letter will stipulate the minimum application value for direct payment procedures.

D. CONCLUSION

22. The overall conclusions of the current financial management assessment are as follows:

- The proposed financial management arrangements satisfy the Bank's minimum requirements for financial management at the project.
- Overall project financial management risk is assessed as low.

Annex 8: Procurement Arrangements

South Africa – Renewable Energy Market Transformation Project

A. GENERAL

1. The procurement under this project involves selection and employment of consultants in the following broad areas: project management, policy formulating, capacity building (including training and workshops), monitoring and evaluation, and management associated with implementing the project. It also involves the procurement of goods as part of demonstrative CSWH subprojects supported with cost-share performance grants.

2. Contracts for consulting services by firms or individuals will be awarded in accordance with the Bank's *Guidelines for Selection and Employment of Consultants by World Bank Borrowers*, dated October 2006, and the provisions stipulated in the Grant Agreement. The Bank's Standard Request for Proposals (RFP), the appropriate Forms of Contracts (lump sum, time-based, and/or simplified contracts for short-term assignments and individual consultants), as well as the Sample Form of Evaluation Report for the Selection of Consultants will be used. For each contract to be financed by the Grant, the different procurement methods or consultant selection methods, the need for pre-qualification, estimated costs, prior review requirements, and time frame are agreed between the Grant Recipient and the Bank in the Procurement Plan. The Procurement Plan will be updated at least annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.

Selection of Consultants

3. The ISU at DBSA will obtain consultant services in the form of TA, including implementation support through contracts with firms and individuals. These consultants will assist the ISU at DBSA in a suite of activities such as project management, policy formulating, capacity building (including training and workshops), monitoring and evaluation, and management associated with implementing the project. The selection of consultants will be done in the following manner:

- For contracts estimated to cost less than US\$500,000 equivalent per contract, the shortlist may contain entirely national consultants (firms registered or incorporated in the country), provided the shortlist complies with paragraph 2.7 of the *Consultant Guidelines*.
- *Quality-and-cost-based selection*: All consulting service contracts with firms valued at more than US\$200,000 equivalent will be awarded through the quality and cost-based selection (QCBS) method in accordance with the provisions of Section II, paragraph 3 of Appendix 1 and Appendix 2 of the *Consultant Guidelines*.
- *Selection based on consultants' qualifications* (applicable to selection of firms): This method may be used for assignments, valued at less than US\$200,000 equivalent per

contract, for which the need for preparing and evaluating competitive proposals is not justified. In such cases, the DBSA will follow the procedures in paragraph 3.7 of the *Consultant Guidelines*: "The Client will prepare the TORs, request expressions of interest and information on the consultants' experience and competence relevant to the assignment and establish a short list, and select the firm with the most appropriate qualifications and references. The selected firm shall then be asked to submit a combined technical and financial proposal for consideration and contract negotiation."

- DME noted that they are obligated to follow the government policy to encourage Black Economic Empowerment (BEE), as DME is one of the leading ministries that initiated the BEE policy. When calling for Expressions of Interest from interested firms, one of the criteria for shortlisting may include the South African BEE policy; that is, to show proof that they have fulfilled this policy requirement of the government. The shortlisting process will, among other key criteria, take BEE into account.
- Evaluation of Expression of Interest shall not be an arithmetical exercise. Short list shall comprise six qualified firms, according to paragraph 2.6-2.7 of the *Consultant Guidelines*.
- Evaluation of proposals from the shortlisted firms will be based on criteria elaborated in the *Consultant Guidelines*, such as experience of the firm in the specific area of the TOR, qualifications of key staff, methodology, and so forth.
- Although national firms are capable of carrying out most of the project activities, in cases where international experience or expertise is needed (particularly regarding renewable energy policy and regulatory frameworks), the TOR will specify that international experience and expertise are required (as reflected by participation among key staff) and should be listed as one of the key evaluation criteria. This does not exclude South Africa nationals who have required international experience and expertise.
- All contracts for the selection of firms will have their short list established only after publication of a Solicitation of Expression of Interest (SOEI) in local newspapers of wide circulation. This can be done for several consultancy services at once, if convenient, particularly if the services are needed at the same period. In addition, SOEI for contracts worth US\$200,000 or more equivalent shall be advertised in UNDB online and dgMarket, according to paragraph 2.5 of the *Consultant Guidelines*
- Services of individual consultants meeting the requirements of Section V of the *Consultant Guidelines* will be selected under the provisions for the Selection of Individual Consultants method. For large assignments, such as assignments No. 11–12 in the procurement plan, requests for expression of interests shall be advertised in a national newspaper and in an international newspaper or a technical magazine. This can be done for several consultancy services at once from time to time to enable the project to have a roster of interested and qualified individual consultants. Individual consultants (IC) will be selected through comparison of the applicant's curriculum vitae against job description requirements, or requirements identified directly by DBSA. Civil servants

cannot be hired as consultants under the project, unless conditions stated in 1.11 (d) of the *Consultant Guidelines* are met.

- Services that are estimated to cost less than US\$100,000 equivalent per contract, may, with the Bank's prior agreement, be procured in accordance with the provisions of paragraph 3.9 to 3.13 of the *Consultant Guidelines*.

B. ASSESSMENT OF THE AGENCY'S CAPACITY TO IMPLEMENT PROCUREMENT

4. DBSA will be responsible for all the procurement activities including contract management. An assessment of the capacity of the Implementing Agency to implement procurement actions for the project has been carried out by the Lead Procurement Specialist, Africa Region. The following summarizes the findings from the assessment:

- From 1997 to 1999, DBSA successfully administered PHRD Grant No. TF027018 amounting to US\$1 million. All procurements under the grant were done using the Bank's Procurement Guidelines. The total number of contracts handled was 12, and this included handling of all contract management issues.
- From 2002 to 2004, DBSA, on behalf of the South Africa National Treasury, successfully handled all procurement activities (mainly selection of consultants) under the Municipal Financial Management TA Project (IBRD Loan 7146). The total amount of contracts awarded was over US\$12 million using QCBS method.
- All procurement activities will be handled by a team of four professionals, who have adequate experience in handling Bank-financed contracts. They will be responsible for handling all financial and accounting aspects of contract management.

C. PROCUREMENT OF CONSULTANT SERVICES AND GOODS BY COMPANIES AND ORGANIZATIONS UNDER MATCHING GRANTS AND PERFORMANCE GRANTS

5. The project has allocated US\$1,750,000 for matching grants and US\$250,000 for performance grants. Annex 4 has outlined preliminary Implementation Guidelines for the matching grants and performance grants, including eligible recipients, eligible activities and expenditure, evaluation criteria and procedure, and so forth. Development of detailed rules and procedures for the matching grants and performance grants is a condition for disbursement of the matching grant and performance grant components. The ISU will evaluate the proposals for matching grants and performance grants, and will establish internal approval and rejection procedures, which will be approved by the SC.

6. The matching grant will provide up to a maximum of 50 percent of eligible expenditure on consulting services for both generation of renewable energy power and CSWH-related capacity-building subprojects, and performance grants will provide up to a maximum of 50 percent of eligible expenditure on consulting services and goods for CSWH-related capacity-

building subprojects. The maximum aggregate amount of matching grants and performance grants per company will be no more than US\$100,000 over the course of the REMT project for capacity-building subprojects related to renewable energy power generation , and US\$50,000 over the course of the project for CSWH-related capacity-building subprojects.

7. Consultant services that are procured as part of subproject activities co-financed by matching grants and services and goods procured as part of subproject activities co-financed by performance grants will be procured by the beneficiary company or organization in accordance with prudent and established commercial practices acceptable to the Bank. Consideration shall also be given to the use of competitive procedures, as outlined in the *Consultant Guidelines*, particularly for large assignments.

8. The commercial practices for procurement under the matching grants and performance grants should be explained in detail in the grant implementation procedures manual to be reviewed and approved by the Bank, and emphasized that adequate mitigation measures and control mechanisms against fraudulent and corrupt practices should be included in the detailed rules and procedures for the matching grants and performance grants.

9. The overall project risk for procurement is *low*.

D. PROCUREMENT PLAN

10. The Recipient, at appraisal, developed a Procurement Plan for project implementation that provides the basis for the procurement methods. This Plan will be agreed between the Recipient and the Project Team on April 23, 2007. The Plan will also be available in the project's database and on the Bank's external Web site. The Procurement Plan will be updated in agreement with the Project Team annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.

E. FREQUENCY OF PROCUREMENT SUPERVISION

11. In addition to the prior review supervision to be carried out from Bank offices, the capacity assessment of the Implementing Agency has recommended one supervision mission per year to visit the field to carry out post review of procurement actions.

F. DETAILS OF PROPOSED MAJOR CONTRACTS UNDER THE GRANT

(a) List of consulting assignments for the first 18 months of project implementation

1	2	3	4	5	6	7	8
No	Description of assignment	Estimated cost (US\$ equivalent)	Selection method	Advertising	Review by Bank (prior/post)	Proposals submission date	Expected completion date
Renewable Energy Power Generation							
Policy and Regulatory Framework							
1.	Review renewable energy policy instruments and financing mechanisms and recommendations for South Africa	50,000	IC	Yes	Post	10/2007	03/2008
2.	Preparation of Renewable Energy Law in South Africa	400,000	QCBS	Yes	Prior	12/2007	06/2009
3.	Preparation of detailed renewable energy policy and regulations	500,000	QCBS	Yes	Prior	12/2007	06/2009
4.	Develop financing mechanisms	200,000	QCBS	Yes	Prior	12/2007	06/2009
Capacity Building and Information Dissemination							
5.	Capacity building to DME and NERSA on renewable energy policy framework (training and workshop)	50,000	CQS	Yes	Post	01/2008	12/2008
6.	Capacity building and training to industry and financial institutions on renewable energy power and solar	80,000	CQS	Yes	Prior	01/2008	12/2008
7.	Renewable Energy Resource: compile existing information and develop database	250,000	QCBS	Yes	Prior	12/2007	12/2009
Business support							
8.	Design the matching grant (criteria, procedure, etc.) for renewable energy power generation and solar water heater	50,000	IC	Yes	Post	10/2007	2/2008
Commercial Solar Water Heating							
Capacity building							
9.	Preparation of standards and design of integration of solar water heaters in buildings to become best practices for CSWH	\$100,000	IC	Yes	Prior	12/2007	12/2008
10.	Promotion campaign for CSWH	\$100,000	CQS	Yes	Prior	01/2008	12/2009
Project management, implementation support, and monitoring and evaluation							
11.	Project Coordinator for renewable energy power generation and solar water heating	400,000	IC	Yes	Prior	10/2007	12/2011
12.	Business Support Specialist for	300,000	IC	Yes	Prior	10/2007	12/2011

	renewable energy power generation and solar water heaters						
13.	Collection of baseline data and setting up of monitoring and evaluation for renewable energy power generation and CSWH	25,000	IC	No	Post	07/2007	12/2007

(b) Goods, services, and consultants services procured by companies and organizations under matching grants and performance grants

1.	Consulting services under the matching grants cost-shared pre-feasibility and feasibility studies (help desk) for Renewable Energy Power Generation and CSWH	1,750,000	Commercial practice based on Implementation Guidelines	Yes	Prior Refer to (c) below	12/2007	12/2011
2.	Consulting services and goods under the performance grants for Commercial Solar Water Heating	\$250,000	Commercial practice based on Implementation Guidelines	Yes	Prior Refer to (c) below	12/2007	12/2011

(c) The Bank will review the Terms of Reference for all consultancy services, except for those procured by companies or organizations under cost-share matching grants and performance grants, for firms and individuals. In addition, in the case of contracts above US\$100,000 for consulting firms and above US\$75,000 for individual consultants, prior Bank review will apply for the following: (i) selection procedures, shortlists and RFPs, technical evaluation reports, final evaluation reports, and draft contracts when the estimated cost of the contract exceeds US\$100,000 for firms and US\$75,000 for individuals; and (ii) contract amendments as per paragraph 3 of Appendix 1 of the *Consultant Guidelines*. Contracts not subject to prior review will be post reviewed in accordance with Appendix 1 of the *Consultant Guidelines*.

(d) *Short lists composed entirely of national consultants*: Short lists of consultants for services estimated to cost less than US\$500,000 equivalent per contract may be composed entirely of national consultants in accordance with the provisions of paragraph 2.7 of the *Consultant Guidelines*.

Annex 9: Economic and Financial Analysis

South Africa – Renewable Energy Market Transformation Project

1. The economic and financial analysis examined a sample of potential projects for each renewable energy technology—small hydro, sugar bagasse, wind, pulp and paper industry, landfill gas, and solar water heating—to reach the 10,000 GWh target set in the government’s White Paper for Renewable Energy. Therefore, REMT can proceed with some confidence that there are viable renewable energy project transactions that will be taken up by the private sector in response to the market transformation activities planned for REMT.

2. The economic and financial analysis follows a renewable energy cost supply curve approach, as shown in Figure A.9.1, based on a detailed economic and financial analysis of a sample of projects to meet the government’s target of 10,000 GWh per year. Similar approach for economic and financial analysis is also adopted in other World Bank renewable energy projects in China and Croatia. This approach is particularly appropriate to a sector where the bulk of the projects are expected to be undertaken in the private sector, structured either as non-recourse financed IPPs or under balance sheet financing by large corporations (e.g. as in pulp and paper).

3. Such a methodology of economic analysis for renewable energy is illustrated by figure A.9.2. Traditional financial analysis, based on discounted cash-flow accounting, undervalues future fuel price risks and completely ignores the environmental and health costs of fossil-fueled power plant emissions. As a result, the current utilization of modern renewable energy (excluding traditional biomass use) in most countries is quite small. Yet, on a life-cycle cost basis, some renewable energy technologies are already cost competitive with conventional energy sources. However, the potential of these financially viable renewable energy technologies is not fully realized because of a variety of market barriers.

4. As shown in figure A.9.2, if the cost of local environmental externalities and global externalities (for example, carbon credits) are included in the economic valuation, as is done in a typical World Bank Group economic calculation, the economically viable quantity of renewable energy increases. If the diversification value is also added to the economic cost, the economically viable optimum quantity of renewable energy becomes even larger.

5. While economic analysis shows a project to be economically attractive, based on economic costs, shadow priced as appropriate, and benefits assessed on the basis of avoided generation costs priced at economic long-run marginal cost (LRMC), financial returns can be insufficient for implementation by the private sector. Given the market distortion that environmental externalities and diversification values are not recognized in the market place, together with a series of market barriers, financial incentives are required in the form of higher level of tariff, government subsidy, concessional loans from development banks, and various forms of public-private partnerships to attract investors to achieve the economically viable optimum quantity of renewable energy.

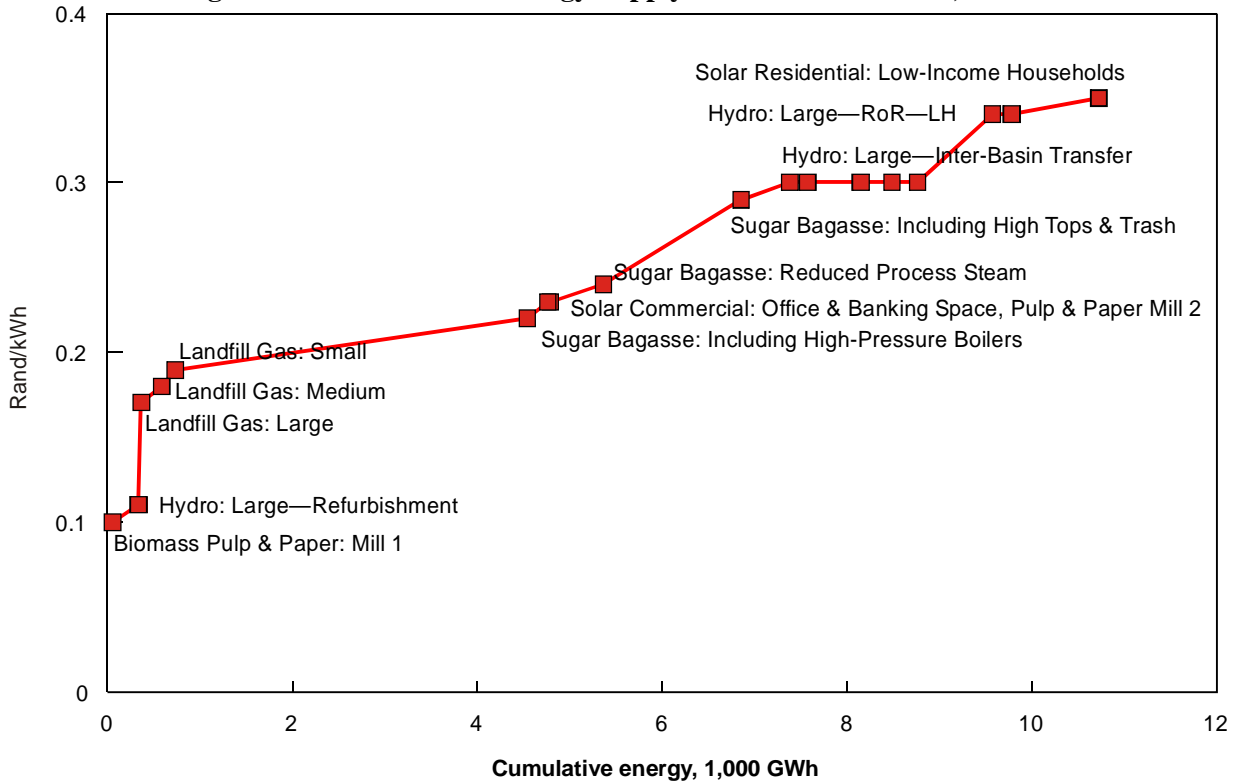
6. The analysis shows that the estimated least-cost supply for the first 10,000 GWh would come from the following technologies:

- Wind is not part of the first 10,000 GWh
- All of the landfill gas potential is within the first 10,000 GWh (and occupies a significant portion of the first 1,000 GWh)
- The balance of the 10,000 GWh target is made up of commercial solar water heating, small hydro, pulp & paper, and the sugar industry.

7. Therefore, with the exception of wind, it was possible to find viable projects for all the resources, and the analysis shows that it is feasible to reach the government's target of 10,000 GWh with relatively small amounts of carbon finance. The analysis shows that the only resource where carbon finance increases the returns significantly is landfill gas; in other cases, carbon finance will play mainly a catalytic role.

8. Table A.9.1 shows the technology mix and supply potential from each technology to reach government's target of 10,000 GWh. This should not be interpreted to mean that all the potential of a particular renewable resource will be fully used up by the GWh attributed to it. For example, the 240 GWh contribution of landfill gas (LFG) is from seven "identified projects" that have been studied in detail, and the additional contribution of 600 GWh is from 57 sites that have been studied in lesser detail. A very conservative approach was adopted for these 57 sites, and it is quite possible that the true potential is twice the estimated amount. A similar conservative approach has been used for the other resources also.

Figure A.9.1: Renewable Energy Supply Curve—The First 10,000 GWh

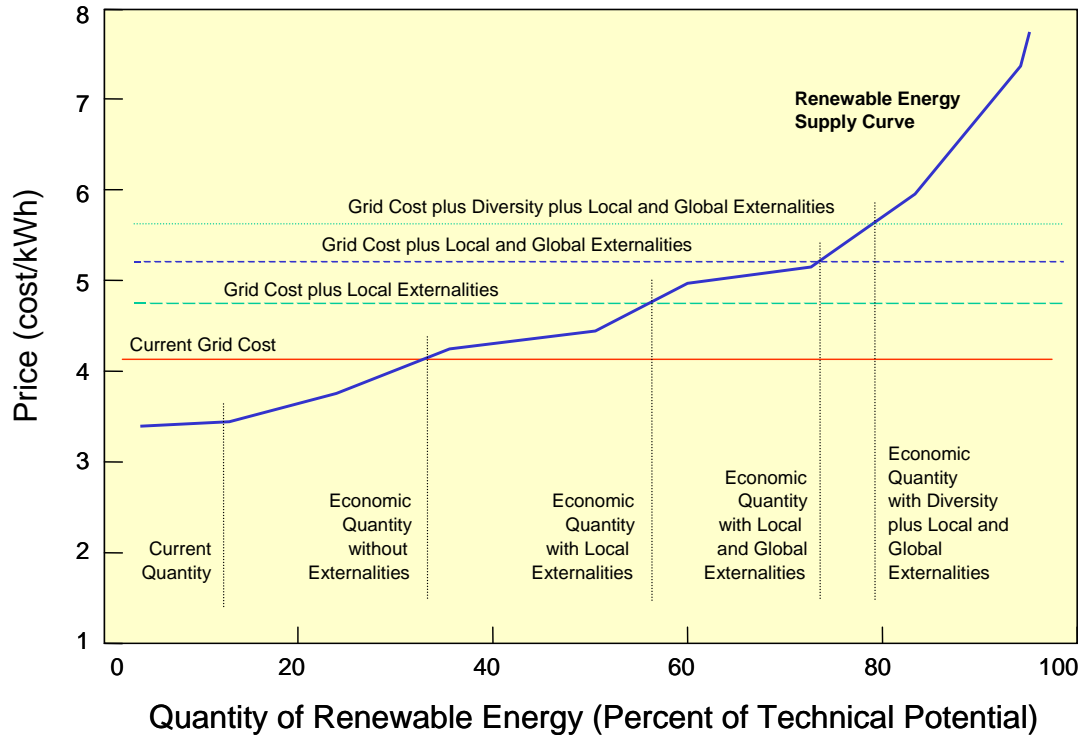


Source: Conningarth Economists, June 2004.

Table A.9.1: Renewable Energy Supply Curve—Sources

Source	Project	First 1,000 GWh	Next 4,000 GWh	Total 10,000 GWh target
Sugar	Sugar mills spare capacity	55	55	55
	Reduced-process steam	109	109	109
	Full-scale cogeneration		551	1,380
Solar Water Heater		175	1,000	3,633
Pulp & Paper	Ngodwana	65	65	65
	Additional projects	20	170	340
Hydro	Identified projects	210	210	210
	Additional projects	75	1,000	3000
Landfill Gas	Identified projects	240	240	240
	Additional projects	51	600	600
Wind		0	0	368
Total		1,000	4,000	10,000

Figure A.9.2: Economic Valuation of Renewable Energy



A. ECONOMIC ANALYSIS

9. A standard economic analysis was undertaken for each sample project. NPV and economic rate of return (ERR) are calculated, and benefits of avoided energy at the applicable substation are calculated at the LRMC. ERR is calculated both with and without environmental benefits. In economic analysis, avoided greenhouse gas emissions are valued at the reported PCF transaction price for the Durban Landfill gas project of \$4/tonne CO₂, which is used as the proxy for global willingness to pay for South Africa’s carbon reductions and may be taken as the relevant economic benefit. The quantity of GHGs avoided is taken at 0.89 Kg CO₂/kWh, based on the PCF Durban LFG Emission Reduction Study.

10. The analysis identified a number of candidate projects to be financed by the private sector under REMT. The calculated ERRs with environmental benefits range from 13 percent to 24 percent for small hydro projects, 15 percent to 38 percent for sugar bagasse projects, 18 percent for a pulp and paper project, and 31 percent to 34 percent for landfill gas projects.

11. For commercial solar water heating, in the absence of any significant taxes or government subsidies, the decision of individual commercial establishments to purchase these systems implies that they will enjoy savings over the conventional electric systems, which in turn implies that there are savings for the country as a whole; that is, the projects are justified on an economic basis. This is reinforced by the fact that a small number of such systems are already being bought and sold in South Africa without any government interventions.

12. An economic analysis of a CSWH system was conducted. In this analysis, the economic costs are the current costs prevailing in South Africa; it is expected that costs will decline in the future as the scale of the market increases. There are two types of benefits:

- Local: Since the use of CSWH instead of conventional electricity is a form of “fuel switching,” the benefits are the costs avoided by switching; that is, the economic cost of the electricity saved. In the CSWH case, this consists of the generation plus network costs, and in South Africa, Eskom’s tariff is the best available indicator of these costs. For simplicity, the “demand charge” and the “energy charge” have been rolled into a single cost per kWh. It is estimated that this combined charge is 25 rand cents (3.62 U.S. cents) per kWh. The economic cost of generation is expected to increase in the next 3–5 years when Eskom would have to add generation capacity to meet peak demand.
- Global: The market value of the carbon emission reductions (CERs) is a measure of global benefits, even though it is recognized that, in practice, it is not yet feasible to sell these CERs because of high transaction costs. The CER price is estimated to be US\$4/ton of CO₂.

13. The economic analysis shows that, at today’s CSWH costs and power tariffs, the CSWH systems are marginally attractive, with an internal rate of return of 14 percent based only local benefits, and 17 percent on adding global benefits. This is consistent with the low level of CSWH market penetration, and indicates that CSWH cost reductions are necessary to make them more attractive to individual end-users as well as the economy as a whole.

South Africa REMT Project												
Economic Analysis of Commercial Solar Water Heating												
	Capital Cost		Annual Electricity Savings			Net Economic Benefits		Annual CO2 Reductions			Net Economic + Environmental Benefits	
Year	ZAR	US\$	kWh	ZAR	US\$	ZAR	US\$	tons	ZAR	US\$	ZAR	US\$
1	200,000	28,986	115,264	28,816	4,176	(171,184)	(24,809)	123	3,401	493	(167,783)	(24,316)
2	-	-	115,264	28,816	4,176	28,816	4,176	123	3,401	493	32,217	4,669
3	-	-	115,264	28,816	4,176	28,816	4,176	123	3,401	493	32,217	4,669
4	-	-	115,264	28,816	4,176	28,816	4,176	123	3,401	493	32,217	4,669
5	5,000	725	115,264	28,816	4,176	23,816	3,452	123	3,401	493	27,217	3,944
6	-	-	115,264	28,816	4,176	28,816	4,176	123	3,401	493	32,217	4,669
7	-	-	115,264	28,816	4,176	28,816	4,176	123	3,401	493	32,217	4,669
8	-	-	115,264	28,816	4,176	28,816	4,176	123	3,401	493	32,217	4,669
9	-	-	115,264	28,816	4,176	28,816	4,176	123	3,401	493	32,217	4,669
10	5,000	725	115,264	28,816	4,176	23,816	3,452	123	3,401	493	27,217	3,944
11	-	-	115,264	28,816	4,176	28,816	4,176	123	3,401	493	32,217	4,669
12	-	-	115,264	28,816	4,176	28,816	4,176	123	3,401	493	32,217	4,669
13	-	-	115,264	28,816	4,176	28,816	4,176	123	3,401	493	32,217	4,669
14	-	-	115,264	28,816	4,176	28,816	4,176	123	3,401	493	32,217	4,669
15	-	-	115,264	28,816	4,176	28,816	4,176	123	3,401	493	32,217	4,669
IRR						14%	14%				17%	17%
Notes and Assumptions												
System size (liters)						10,000						
Solar panel need (liters/square meter)						100						
Cost (installed) per panel						2,000						
Exchange rate (Rand/\$)						6.90						
Electricity cost savings: (US cents/kWh)						3.62						
CO2 emissions (kg per kWh)						1.07						
Value CO2 (\$/ton)						4.00						

B. FINANCIAL ANALYSIS

14. A standard financial model to calculate financial internal rate of return (FIRR) has been developed. The financial analysis is conducted from the perspective of the implementing entity, and the calculated FIRR is therefore a function of the capital structure assumed. Capital costs have been estimated by the sector technical experts at 2004 prices, including physical contingencies, but excluding price contingencies. Capital costs are escalated by the applicable inflation rate to the year of assumed construction outlay. The model assumes loans at variable rather than fixed rates. The current rate of VAT is 14%.

15. In addition, the projects to be financed will be screened by private promoters, commercial lenders, external carbon fund financiers, and in some cases government agencies. The private sector will only invest commercially feasible projects. The financial analysis identified a number of financially viable small hydro, sugar bagasse, pulp and paper, and landfill gas projects, which can be financed by the private sector under REMT.

16. The CSWH investments supported under this project will involve the purchase of these systems by individual commercial customers from independent private sector vendors. It follows that these investments will be viable from the viewpoint of the buyers and sellers, and that the buyers will have a strong incentive to maintain their systems over time.

17. This project will not have any fiscal impacts on the government, apart from the counterpart funds required for this project. Overall, the government's fiscal position is sound, and these expenses will be within the government's medium term expenditure framework (MTEF).

Annex 10: Safeguard Policy Issues

South Africa – Renewable Energy Market Transformation Project

TA and Capacity Building

1. The overall objective of the project is the creation and/or strengthening of the organizations and institutions that would help the government meet its renewable energy target. The capacity areas covered would be the policy setting, promotion, regulation, service provision, and monitoring and evaluation of renewable energy power generation. The agencies covered would include DME, NERSA, and potential project sponsors and financiers.
2. The project development objective is to enhance environmental sustainability in South Africa's energy sector by facilitating significant reduction in South Africa's GHG emissions. DME will contract DBSA to be the implementing agent for the project.

Investments

3. **Commercial solar water heating (CSWH).** The project will support expansion of South Africa's nascent solar water heating industry by promoting installation of systems for solar water heating for commercial, institutional, and industrial applications. This will be coordinated with a UNDP/GEF program aimed at the residential market.
4. There are already a few companies serving the CSWH market in South Africa. However, without any subsidies or other incentives they face some barriers that make it difficult for them to scale up. The near-commercial nature of the CSWH presents good prospects for rapid take-off during the project with GEF support.
5. The project-supported solar water heating investments will be installed in existing institutional, commercial, and industrial facilities, within the confines of their facility perimeters. In most cases, the solar arrays will be installed on rooftops of existing buildings, but ground mounting of the arrays is possible. The associated water storage tanks, pumps, water softening equipment, and so forth for the most part will be installed inside existing buildings, but in any case will be in close proximity to the associated (existing) institutional, commercial, or industrial uses of the hot water. No new land taking is envisioned for the investments.
6. **Renewable energy power generation.** This project is expected to trigger significant private sector investments in renewable energy power generation. *These investments will be financed outside of the REMT project by a combination of private equity and debt, with debt financing facilitated by an output-based revenue stream provided by external "carbon funds" such as the PCF.*

Project Location

7. Project-supported CSWH will be installed primarily in the major cities, including Johannesburg, Pretoria, and Capetown, but eligibility for the program is country-wide.

Safeguard Policies that Might Apply

8. The TA and solar water heating investments in the project are not expected to present any environmental or social risk. Solar water heating is not a “listed activity” with respect to South African environmental requirements, and therefore would not be subject to the environmental screening or environmental assessment process. Since the project does not involve any land taking, and the only construction will be within the perimeter of existing institutional, commercial, or industrial establishments, (and in fact, mostly on rooftops), **no social safeguards are expected to be triggered.**

Annex 11: Project Preparation and Supervision

South Africa – Renewable Energy Market Transformation Project

Timeline

- *PCN review*—July 2004
- *Initial PID to PIC* —July 2005
- *Initial ISDS to PIC* —July 2005
- *Appraisal* —August 2005
- *Negotiations*—November 2005
- *Board/RVP approval* —January 2006
- *Planned date of effectiveness (consistent with Cover Sheet)*—April 2006
- *Planned date of mid-term review (if applicable)*—July 2008

Key institution(s) responsible for preparation of the project.

The key institution responsible for preparing the project is DME. There have also been detailed discussions with DBSA, as it will have a key role in implementation.

Bank staff and consultants

- Xiaodong Wang, Task Team Leader
- Arun P. Sanghvi, Lead Energy Specialist
- Edith Mwenda, Senior Counsel
- Slaheddine Ben-Halima, Senior Procurement Specialist
- Patrick Piker Umah Tete, Senior Financial Management Specialist
- Suzanne Morris, Senior Finance Officer
- Christopher Warner, Senior Environmental Specialist
- Augustine Wright, Program Assistant

Project preparation costs to date	US\$160,000
Estimated costs to approval	US\$40,000
Supervision costs	US\$65,000 per year

Annex 12: Documents in the Project File
South Africa – Renewable Energy Market Transformation Project

- Government of South Africa, 2003, *White Paper on Renewable Energy*
- Conningarth Economists, June 2004, *Economic and Financial Analysis Due Diligence*, Renewable Energy Market Transformation (REMT) Project, Report to the World Bank
- World Bank, August 17, 2004, “Assessment of Interest and Capacity of South African Financial Organizations to Finance Renewable Energy Investments”

Annex 13: Statement of Loans and Credits
South Africa – Renewable Energy Market Transformation Project

Table A.13.1: South Africa: Renewable Energy Market Transformation

Project ID	FY	Purpose	Original Amount in US\$ millions					Difference between expected and actual disbursements		
			IBRD	IDA	SF	GEF	Cancel.	Undisb.	Orig.	Frm. Rev'd
P064438	2004	GREAT ADDO	0.00	0.00	0.00	5.50	0.00	5.50	0.48	0.00
P075997	2004	ZA-CAPE Action Plan (FY04)	0.00	0.00	0.00	9.00	0.00	7.85	0.35	0.00
P076901	2003	Municipal Financial Management TA	15.00	0.00	0.00	0.00	0.00	13.37	7.42	0.00
P052368	2002	ZA - MALOTI-DRAKENSBERG CONSERV. & DEV	0.00	0.00	0.00	7.93	0.00	7.75	3.32	0.00
P035923	1998	CAPE PENINSULA	0.00	0.00	0.00	12.30	0.00	0.56	12.28	0.00
P048606	1997	IND.COMPET&JOB CREAT	46.00	0.00	0.00	0.00	21.53	3.02	24.55	-1.39
Total:			61.00	0.00	0.00	34.73	21.53	38.05	48.40	- 1.39

Table A.13.2: South Africa Statement of International Financial Services Companies (IFCs)—Held and Disbursed Portfolio (US\$ million)

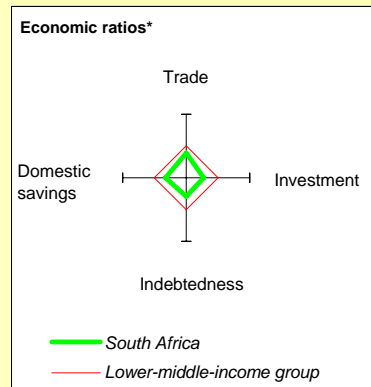
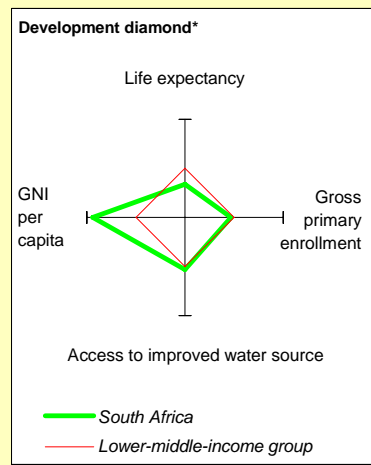
FY Approval	Company	Committed				Disbursed			
		IFC				IFC			
		Loan	Equity	Quasi	Partic.	Loan	Equity	Quasi	Partic.
1999	AEF Bulwer	0.00	0.00	0.19	0.00	0.00	0.00	0.19	0.00
1996	AEF Carosa Farm	0.00	0.09	0.13	0.00	0.00	0.09	0.13	0.00
2000	AEF DBS	0.00	0.00	0.75	0.00	0.00	0.00	0.75	0.00
1999	AEF Dargle Timbr	0.38	0.00	0.00	0.00	0.38	0.00	0.00	0.00
1997/98	AEF E.R. Medical	0.00	0.18	0.00	0.00	0.00	0.18	0.00	0.00
1999	AEF Foxtrot Meat	0.38	0.00	0.00	0.00	0.38	0.00	0.00	0.00
1999	AEF IHS Techno	0.15	0.00	0.65	0.00	0.15	0.00	0.65	0.00
2000	AEF Tusk	1.67	0.10	0.00	0.00	1.67	0.10	0.00	0.00
1995/96/99	AFLIFE	0.00	5.86	0.00	0.00	0.00	5.86	0.00	0.00
2002/04	African Bank	5.60	0.00	0.00	0.00	4.04	0.00	0.00	0.00
2002	Bioventures	0.00	2.52	0.00	0.00	0.00	1.41	0.00	0.00
2004	City of Johannes	30.09	0.00	0.00	0.00	30.09	0.00	0.00	0.00
2000	EDU LOAN	2.41	0.00	0.00	0.00	2.41	0.00	0.00	0.00
2004	Hernic	23.89	4.70	1.86	0.00	5.70	4.70	1.38	0.00
2004	Mvela Gold	0.00	0.00	27.95	0.00	0.00	0.00	27.95	0.00
2002	NAMF	0.00	5.00	0.00	0.00	0.00	0.54	0.00	0.00
2001	Printability	5.85	1.50	2.36	0.00	5.85	1.50	2.36	0.00
1995	SAFCF	0.00	1.18	0.00	0.00	0.00	1.18	0.00	0.00
2000/02/03/04	SAHL	0.00	0.66	0.00	0.00	0.00	0.66	0.00	0.00
1999	SAPEF	0.00	27.22	0.00	0.00	0.00	26.60	0.00	0.00
2001	Spier	16.13	1.87	0.00	0.00	16.13	1.87	0.00	0.00
Total portfolio:		86.55	50.88	33.89	0.00	66.80	44.69	33.41	0.00

		Approvals Pending Commitment			
FY Approval	Company	Loan	Equity	Quasi	Partic.
2000	EDU LOAN	0.00	0.00	0.00	0.00
Total pending commitment:		0.00	0.00	0.00	0.00

Annex 14: Country at a Glance

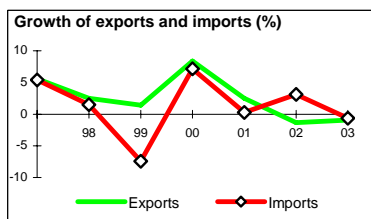
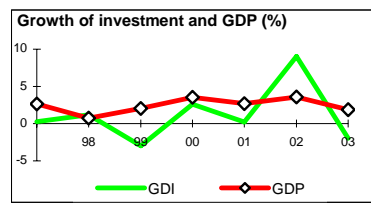
South Africa – Renewable Energy Market Transformation Project

POVERTY and SOCIAL	South Africa	Sub-Saharan Africa	Lower-middle-income		
2003					
Population, mid-year (millions)	45.3	703	2,655		
GNI per capita (Atlas method, US\$)	2,780	490	1,480		
GNI (Atlas method, US\$ billions)	125.9	347	3,934		
Average annual growth, 1997-03					
Population (%)	1.7	2.3	0.9		
Labor force (%)	2.0	2.4	1.2		
Most recent estimate (latest year available, 1997-03)					
Poverty (% of population below national poverty line)		
Urban population (% of total population)	57	36	50		
Life expectancy at birth (years)	46	46	69		
Infant mortality (per 1,000 live births)	52	103	32		
Child malnutrition (% of children under 5)	11		
Access to an improved water source (% of population)	86	58	81		
Illiteracy (% of population age 15+)	14	35	10		
Gross primary enrollment (% of school-age population)	105	87	112		
Male	107	94	113		
Female	103	80	111		
KEY ECONOMIC RATIOS and LONG-TERM TRENDS					
	1983	1993	2002	2003	
GDP (US\$ billions)	84.7	130.4	106.3	159.9	
Gross domestic investment/GDP	24.7	15.3	15.5	14.9	
Exports of goods and services/GDP	24.4	21.5	33.3	27.6	
Gross domestic savings/GDP	28.3	19.0	18.9	18.9	
Gross national savings/GDP	24.6	16.4	15.7	16.1	
Current account balance/GDP	0.0	1.1	0.3	0.4	
Interest payments/GDP	0.0	0.0	0.8	0.6	
Total debt/GDP	0.0	5.1	23.5	17.4	
Total debt service/exports	0.0	0.0	12.2	10.5	
Present value of debt/GDP	23.5	..	
Present value of debt/exports	64.8	..	
	1983-93	1993-03	2002	2003	2003-07
(average annual growth)					
GDP	0.9	2.7	3.6	1.9	3.2
GDP per capita	-1.4	0.6	2.3	2.0	3.5



STRUCTURE of the ECONOMY

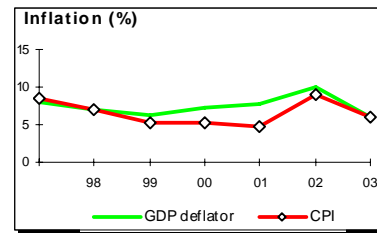
	1983	1993	2002	2003
<i>(% of GDP)</i>				
Agriculture	4.4	4.2	4.1	3.8
Industry	44.5	35.5	32.2	31.0
Manufacturing	23.4	21.1	19.4	18.9
Services	51.1	60.3	63.7	65.2
Private consumption	55.2	60.9	62.3	67.3
General government consumption	16.4	20.1	18.9	13.8
Imports of goods and services	20.8	17.8	29.9	23.7
<i>(average annual growth)</i>				
Agriculture	3.2	1.5	4.0	-5.2
Industry	0.1	1.8	3.7	0.5
Manufacturing	0.3	2.2	5.2	-1.0
Services	1.6	3.3	3.1	3.2
Private consumption	1.8	2.8	3.1	2.7
General government consumption	2.8	1.2	3.7	6.0
Gross domestic investment	-4.0	2.8	9.0	-2.0
Imports of goods and services	2.8	3.9	3.1	-0.7



* The diamonds show four key indicators in the country (in bold) compared with its income-group average. If data are missing, the diamond will be incomplete.

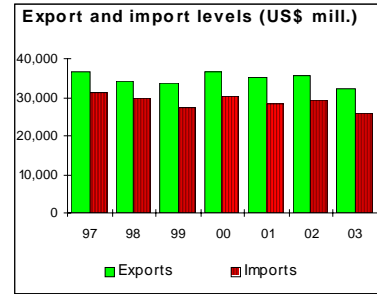
PRICES and GOVERNMENT FINANCE

	1983	1993	2002	2003
Domestic prices				
<i>(% change)</i>				
Consumer prices	12.3	9.7	8.9	6.0
Implicit GDP deflator	18.5	13.1	10.1	5.9
Government finance				
<i>(% of GDP, includes current grants)</i>				
Current revenue	22.4	26.5	24.2	23.3
Current budget balance	0.1	-4.6	1.0	0.2
Overall surplus/deficit	-4.6	-8.9	-1.1	-1.9



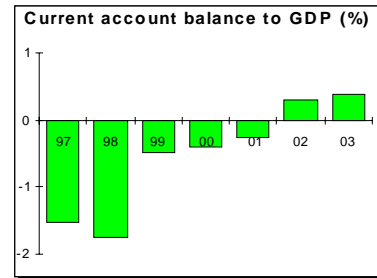
TRADE

	1983	1993	2002	2003
<i>(US\$ millions)</i>				
Total exports (fob)	20,966	28,034	35,471	32,179
Gold	8,912	6,872	4,046	3,667
Food, beverages, and tobacco	1,366	1,984	2,091	..
Manufactures	4,225	11,359	18,917	22,206
Total imports (cif)	15,865	20,873	29,453	26,021
Food	663	774	983	4,225
Fuel and energy	1,136	951	1,461	4,225
Capital goods	2,627	3,547	4,960	4,894
Export price index (1995=100)	..	93	78	81
Import price index (1995=100)	..	95	79	82
Terms of trade (1995=100)	..	97	99	99



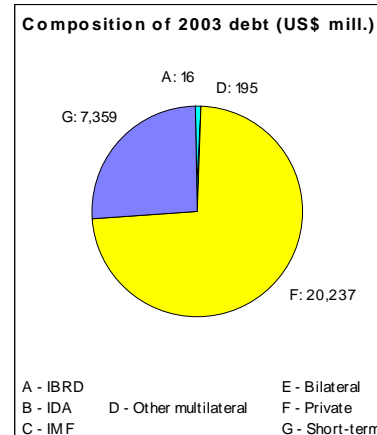
BALANCE of PAYMENTS

	1983	1993	2002	2003
<i>(US\$ millions)</i>				
Exports of goods and services	20,917	28,025	36,670	36,867
Imports of goods and services	17,609	23,233	33,039	31,576
Resource balance	3,308	4,792	3,631	5,291
Net income	-3,494	-2,662	-2,748	-3,714
Net current transfers	95	-641	-572	-961
Current account balance	9	1,489	310	616
Financing items (net)	291	1,240	-3,715	-615
Changes in net reserves	-300	-2,729	3,404	-1
Memo:				
Reserves including gold (US\$ millions)	4,459	3,589	7,620	7,495
Conversion rate (DEC, local/US\$)	1.1	3.3	10.5	7.6



EXTERNAL DEBT and RESOURCE FLOWS

	1983	1993	2002	2003
<i>(US\$ millions)</i>				
Total debt outstanding and disbursed	..	6,655	25,041	27,807
IBRD	..	0	13	16
IDA	..	0	0	0
Total debt service	..	0	4,692	4,116
IBRD	..	0	1	1
IDA	..	0	0	0
Composition of net resource flows				
Official grants	..	0	281	..
Official creditors	..	0	4	69
Private creditors	..	0	432	2,644
Foreign direct investment	69	11	739	..
Portfolio equity	..	2	-388	..
World Bank program				
Commitments	..	0	15	0
Disbursements	..	0	5	3
Principal repayments	..	0	0	0



Annex 15: Incremental Cost Analysis

South Africa – Renewable Energy Market Transformation Project

A. INTRODUCTION

1. The government's *White Paper on Renewable Energy* (2003) sets the following target for renewable energy:

10,000 GWh (0.8 Mtoe) renewable energy contribution to final energy consumption by 2013, to be produced mainly from biomass, wind, solar and small-scale hydro. The renewable energy is to be utilized for power generation and non-electric technologies such as solar water heating and bio-fuels. This is approximately 4% (1,667 MW) of the estimated electricity demand by 2013 (41,539).

2. There are two broad sources that will contribute to this target:

- Renewable energy power generation. A small part of this would be for own use, while the bulk of it would for sale to third parties *via* Eskom's grid.
- Using sources of energy other than electricity. Prominent in this category is solar water heating, which is a direct substitute for using electricity for water heating.

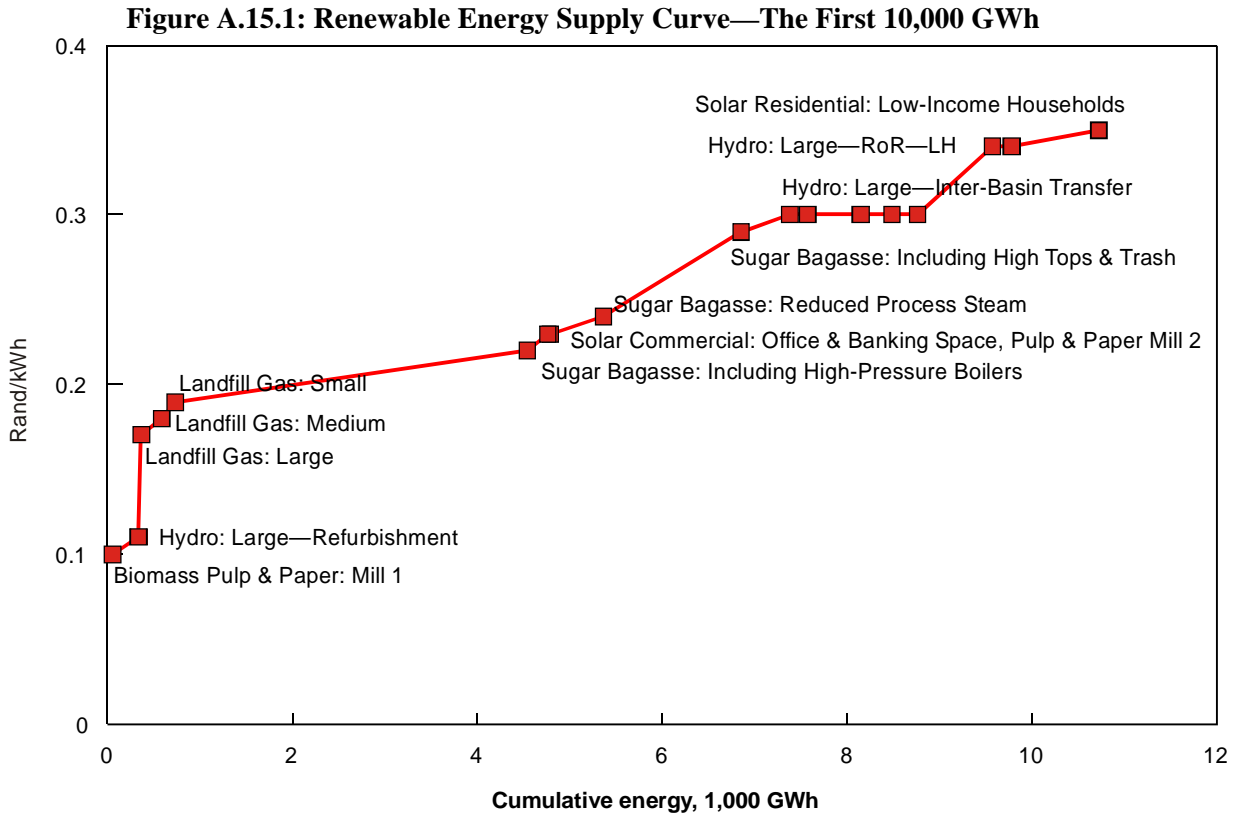
3. Given South Africa's strong industrial and financial sectors, and the high overall level of capacity in the government, a 10-year target of 10,000 GWh may appear to be easy for South Africa to achieve. On the contrary, this is an ambitious target, and there remain significant barriers to meeting it as described below. As long as these barriers remain, there is likely to be limited progress toward achieving this goal.

4. In principle, South Africa could take steps on its own to eliminate these barriers; however, long years of being cut off from international trends as well as an earlier policy of relying heavily on coal make it very difficult for South Africa to move forward alone on renewable energy. With this in mind, the government has requested assistance from the World Bank/GEF in overcoming these barriers.

5. For this purpose, the government intends to use the World Bank as a "knowledge bank" and not as a lending institution, which is consistent with the overall relationship between the government and the Bank so far. The key role of GEF in this project is to grant co-finance TA that would jumpstart the move towards the 10,000 GWh target by eliminating the main barriers. There is no need for GEF to finance the renewable energy investments itself, as the lack of funds to finance the costs of renewable projects is not a barrier in South Africa.

6. The technical feasibility of achieving this target has been demonstrated in a consultant study (Conningarth Economists, June 2004), which developed a “supply curve” of renewable energy. The study examined specific projects in different sources of renewable energy, such as sugar cogeneration, solar water heating, pulp and paper, wind, and so forth. The supply curve derived in this study is shown below in figure A.15.1 and the detailed contribution of each source towards the 10,000 GWh target is shown in table A.15.1.

7. Note that this aggregate supply curve includes solar water heating, which faces a different competitive environment than the other sources. This is because water heating competes, effectively, against the retail electricity tariff, whereas the other sources compete against the wholesale electricity tariff. The implication is that solar water heating is likely to be more attractive than shown in this aggregate supply curve.



Source: Conningarth Economists, June 2004.

8. This supply curve should not be interpreted to mean that all the potential of a particular renewable resource will be fully used up by the GWh attributed to it. For example, the 240 GWh contribution of landfill gas (LFG) is from seven “identified projects” that have been studied in detail, and the additional contribution of 600 GWh is from 57 sites that have been studied in lesser detail. A very conservative approach was adopted for these 57 sites, and it is quite possible that the true potential is twice the estimated amount. A similar conservative approach has been used for the other resources also.

B. BASELINE SCENARIO

Renewable Energy Power Generation

9. While a number of pilots have been proposed for renewable energy power generation in South Africa, they are still at the advanced preparation stage, and have not reached financial closure, including the proposed Darling Wind Farm. All of them represent “special cases,” in the sense that there are unique factors that underlie the projects. A common factor is that none of them are financially attractive on their own; given Eskom’s low-cost, coal-based power generation, all of them rely on external funds to be financially attractive. Nevertheless, perhaps two or three of these will reach financial closure in the next few years with financial support from official or international funds.

Table A.15.1: Renewable Energy Supply Curve—Sources

<i>Source</i>	<i>Project</i>	<i>First 1,000 GWh</i>	<i>Next 4,000 GWh</i>	<i>Total 10,000 GWh target</i>
Sugar	Sugar mills spare capacity	55	55	55
	Reduced-process steam	109	109	109
	Full-scale cogeneration		551	1,380
Solar Water Heater		175	1,000	3,633
Pulp & Paper	Ngodwana	65	65	65
	Additional projects	20	170	340
Hydro	Identified projects	210	210	210
	Additional projects	75	1,000	3000
Landfill Gas	Identified projects	240	240	240
	Additional projects	51	600	600
Wind		0	0	368
Total		1,000	4,000	10,000

10. Once a government, and particularly a government with the extent of the resources that the South African government commands, officially adopts a target, it seems natural to presume that the achievement of this target is the baseline scenario, with the implication that GEF funds should be used to go beyond this target. However, this is not the case in South Africa, where the government adopted the target with the expectation that external funds would be available to help achieve the target. In part, this expectation arose from the fact that, in the process of preparing the *White Paper on Renewable Energy*, DME and the World Bank had a lengthy dialog, during which the government came to view the Bank as a knowledge bank as well as a conduit for external funds.

11. At the June 2004 Bonn International Conference on Renewable Energies, South Africa reaffirmed its commitment to the goals set out in the *White Paper on Renewable*

Energy, and clearly laid out the expectation that the World Bank and GEF would be key actors in achieving the *White Paper* goals, as shown by table A.15.2 below.

12. As a result, the baseline scenario is that there will be insignificant progress towards meeting the government’s 10,000 GWh renewable energy target.

Table A.15.2: Actors in Achieving *White Paper* Goals

Leading actor(s)	Participating actor(s)	Title
South Africa/DME	Key government departments, DANIDA, Eskom, GEF, NERSA, CEF, DBSA, World Bank, Association of Commercial Building Owners, ESCOs, South African Qualifications Authority, energy sector, Education and Training Authority, educational institutions, appliance labeling industry, consumer groups, EU, USAID	The <i>White Paper</i> , the Energy Efficiency and the Appliance Labeling Program
South Africa: (1) NERSA (2) Department of Science and Technology	(1) Energy utilities, CEF, other energy stakeholders and the donor community (2) Research bodies	(1) Regulatory Framework for Renewable Energy (2) Research and Development on Renewable Energy
South Africa/DME	DBSA, UNDP, Central Energy Fund, Eskom, National Electricity Regulator, public/private sector, World Bank, GEF and donor community	South African Wind Energy Program

Source: http://www.renewables2004.de/pdf/conference_report.pdf.

13. The main barriers to scale-up are as follows:

- Lack of policy and institutional framework for sale of power into the main grid. The government has set up working groups to formulate plans for unbundling Eskom. This is expected to lead to the formation of about six regional electricity distributing companies (REDs), about three generating companies, and a transmission company. Since these working groups do not have a mandate to specifically consider renewable energy, the government has requested Bank assistance in this regard.
- Absence of readily available, reliable, basic information about renewable energy resources. This information has the characteristics of a “public good,” which no individual developer has any incentive to develop, and therefore has to be developed with public resources.
- Developers’ potential unfamiliarity with details of the government’s approach for promoting renewable energy and the nature and extent of government’s support

available for it. The government's *White Paper on Renewable Energy* puts forward broad policy principles and strategies, which is enough to attract potential developers, but not enough to give them concrete guidelines about how to develop individual projects that are consistent with the overall policies.

- Lack of adequate capacity and knowledge in official agencies, and lack of private sector financial institutions that would finance renewable energy investments. While these agencies are generally competent and well-developed, the novelty of renewable energy investments in a country that has historically relied on coal is responsible for the lack of capacity and knowledge.

CSWH

14. South Africa enjoys a very high level of solar radiation—between 4.5 and 6.5 kWh/m² or between 16 and 23 millijoules/m². It is a most promising country for promotion of solar water heating as a carbon avoidance strategy, because of a unique mix of circumstances: high per capita use of electricity for water heating (in turn a function of per capita income and, to some extent, low electricity prices and cold climate); near-total reliance on coal for power generation to meet that electricity demand; and high levels of solar radiation in the areas that use electricity for water heating.

15. A UNDP/GEF Medium Sized Project (GEF Project ID 805) has initiated a process of barrier removal to the adoption of small, household-size solar water heaters. Methods of barrier removal include strengthening standards and testing regimes, establishing codes of practice for installation and service, and demonstration of technologies and financing mechanisms. The GEF project targets about 9,000 household-size solar water heaters in peri-urban housing upgrades for low-income residents.

16. A few firms in the CSWH industry³ have managed to set themselves up without external support or government subsidies, and are supplying a limited number of systems to institutional users such as hotels, hospitals, and hostels.

17. Discussions with companies and potential customers as well as preliminary financial analysis indicates that there is a considerably large market potential for solar water heating systems in the “commercial/institutional market,” both in the main urban centers and in more remote areas. These customers (for example, hospitals and hotels) generally need relatively low-temperature (below boiling) hot water round the clock, and frequently have the ability to finance conversions from, or supplements to, existing electric water heaters. In most cases, these systems will help reduce the demand charge that the commercial users pay to Eskom by reducing their peak electricity demand.

18. The main barriers to scale-up are as follows:

³ The term “commercial” as used here refers to the specific market segment in the solar water heater business. “Commercial” and “institutional” customers use larger systems, as distinguished from “household” customers who use small systems.

- Lack of recognized industry best practices, standards, and codes. The fledgling CSWH market in South Africa does not have established industry best practices, standards, and codes, and the knowledge of the technology among key professional technical and business groups (such as designers, developers, and general contractors) in the potential value chain is limited. Without well-established and understood practices and standards, it is difficult for potential customers in the value chain to make informed decisions. Apart from government standards, it is possible that a *voluntary* or third-party rating of systems may also be of value.
- Potential customers' unfamiliarity and confidence in the performance of the technology. CSWH is a relative novelty in South Africa.
- Potential customers' unease at doing business with the CSWH companies. CSWH companies are small-scale and have been only recently established, especially as compared with the main competitor, Eskom.

Government Strategy

19. The government will set up the policy and institutional framework and financial support schemes to meet its renewable energy target. The *White Paper* states the following:

“The amount of renewable energy that is actually consumed within the next 10 years will be a function of

- The regulatory framework with regard to electricity, liquid fuels and housing and building markets.
- The evolving electricity pricing structure.
- The incentives provided.
- The availability of supportive international finance – donor and private – as well as Government funds, to enable implementation.
- The final operational structure of the power sector and the ease of accessing the national electricity grid and wheeling power to end-users.
- Detailed feasibility results for individual projects.
- Private investment in renewable energy.
- Public awareness, as well as the creation of a demand for green electricity in various sectors of the economy.
- The affordability of renewable energy technology.
- The market uptake of renewable energy technologies.
- Voluntary GHG mitigation measures.
- Enforcement of the CDM.”

(South Africa DME, 2003, *White Paper on Renewable Energy*, p. 25)

20. This statement explicitly recognizes the role of donor international finance, such as GEF funds to be provided under this project, in meeting the 10,000 GWh target.

C. Project Scenario

21. In formal terms, the project has a limited scope and reach, as it provides only funds for technical assistance. However, this TA is catalytic in nature, and is designed to help South Africa reach its 10,000 GWh goal. In other words, looking beyond the specific outputs associated with technical assistance, the ultimate outcome is a jumpstart and significant progress towards meeting the long-term target, which will be met many years after this project is over.

Renewable energy power generation

22. The project will address barriers with TA and capacity building, as shown below (please refer to the main text for detailed financial allocations).

Table A.15.3: Strategies for Dealing with Renewable Energy Barriers

Barrier	Strategy
Lack of policy and institutional framework for sale of power into the main grid	<ul style="list-style-type: none"> • Develop principles and rules specifically targeted at renewable energy power sales in to the grid • Update “supply curve” to meet target, and likely long-term subsidy requirements (green premiums) • Develop detailed options for financing green premiums
Absence of readily available reliable basic information about renewable energy resources	Develop the information and the system for making it available
Potential developers’ unfamiliarity with details of the government’s approach for promoting renewable energy, and the nature and extent of support available for it	Set up a “help desk” to guide potential investors
Lack of adequate capacity and knowledge in official agencies, as well as private sector financial institutions that would finance renewable energy investments	Develop the necessary capacity in this project

23. These activities will take account of and complement the support to be provided by UNDP under the Darling Wind Farm project.

24. These activities are expected to trigger significant private sector investments in renewable energy power generation; these investments will be financed *outside this*

project by a combination of private equity and debt, with debt financing facilitated by an output-based revenue stream provided by external carbon funds. Preliminary analysis indicates the investments would utilize resources such as landfill-gas-to-electricity; bagasse cogeneration in the sugar industry; waste-based generation in the paper industry; small hydro; and possibly wind.

Solar water heating

25. The project will address the barriers with TA and capacity building, as shown below (please refer to the main text for detailed financial allocations).

Table A.15.4: Strategies for Dealing with Solar Water Heating Barriers

Barrier	Strategy
Lack of industry best practices, standards and codes	Assist the industry and government in developing c
Potential customers’ unfamiliarity with the technology and its performance	A promotion program targeted at potential customers in the value chain
Potential customers’ unease at doing business with the companies selling CSWH systems and services	<p>Initiate a “participating CSWH company program”</p> <ul style="list-style-type: none"> • Participation of companies in a program sponsored by an established international agency, which will supervise and verify performance, performance-based monetary incentives for participation, will significantly improve the companies’ status and make them more credible to potential customers. • The program will assist companies in a variety of ways on an as-needed basis: for example, getting certifications that equipment meets standards, equipment performance guarantees in case needed initially, business development services (about US\$250,000 in total) on a cost-shared basis, performance grants (not to exceed US\$250,000 total) for installed systems that are deemed demonstrative or path-breaking. • In return, the companies will agree to meet the program’s code of behavior and risk suspension if they fail to meet the code.

26. These activities are expected to significantly accelerate the CSWH market. It is estimated that without this project an average of about 10–12 commercial systems will be sold per year for the next four or five years. With the project, it is estimated that about 45–50 systems will be sold per year.

Calculation of CO₂ avoidance

27. The CO₂ avoidance calculations are based on the following assumptions and calculated outcomes:

- Average size of a CSWH system: 100 m² collector area; 10,000 liter water storage capacity.
- Increase in water temperature: To 60 degrees Celsius from 17 degrees Celsius.
- Share of solar power in water heating: 60 percent.
- Implied electricity savings per system per day: 320 kWh.
- CO₂ avoided: 1.03 kg/kWh delivered.
- Indirect effect on future CSWH systems: About five times, as the estimated CSWH contribution to the next 4,000 GWh (see Table 1) is about five times that of the expected contribution for the first 1,000 GWh.
- Indirect effects on other resources. The contribution of the other resources is about three times that of CSWH for the next 4,000 GWh (Table 1).

D. LESSONS LEARNED AND REFLECTED IN PROJECT DESIGN

28. Since there has been no significant experience with renewable energy power generation in sub-Saharan Africa, the only available lessons are from experience in other parts of the world. GEF—one of the prime supporters of renewable energy power generation—has sponsored a number of studies that review the worldwide experience, including that in industrialized countries. The main lessons derived from these reviews are as follows:

- Policies that promote production-based incentives rather than investment-based incentives are more likely to spur the best industry performance and sustainability.
- Power-sector regulatory policies for renewable energy should support IPP/PPA frameworks that provide incentives and long-term stable tariffs for private power producers.
- Regulators need skills to understand the complex array of policy, regulatory, technical, financing, and organizational factors that influence whether renewable energy projects are viable.

29. Project design fully reflects these lessons. The regulatory framework to be developed will create the appropriate incentives and market signals, capacity building will be provided to various actors in the supply chains for renewable energy generation, and subsidies by GEF for CSWH will follow the principles of output-based aid.

30. The key features and lessons of other relevant GEF projects are given below.

Wind Power

31. India. During the 1990s, under the Renewable Resources Project, the GEF and World Bank directly financed 41 MW of wind turbine installations and 45 MW of mini-hydro capacity in India. The project also strengthened the capabilities of the India Renewable Energy Development Agency (IREDA) to successfully promote and finance additional private-sector investments.

32. GEF support for wind power occurred in parallel with the rapid market growth that emerged in the mid-1990s, fueled by favorable investment tax policies and a supportive regulatory framework. As a result, and in keeping with international trends, installed costs declined from around \$1,200/kW in 1991 to US\$815–1,010/kW in 1998. In the 1990s, one-year 100 percent investment tax depreciation provided large economic gains for installation of wind farm capacity, regardless of the electricity generation from that capacity; as a result, by 2000, almost 1,200 MW of wind capacity had been installed in India, virtually all of that by the private sector. However, many wind turbines are reportedly not operating at all, with no efforts made by the developers to repair them. A key lesson is that output-based incentives are preferable to investment-based incentives.

33. China. The emerging experience from the World Bank/GEF Renewable Energy Development project in China highlights the pressing need to address regulatory frameworks and find ways to reduce risks to project developers. The project was designed to finance four newly formed wind farm companies for construction of 190 MW of wind farms in Inner Mongolia, Hebei, Fujian, and Shanghai provinces. These companies were to be jointly owned by the State Power Corporation and subsidiary electric power utilities (at regional, provincial, or municipal levels) and would sell power to utilities under PPAs developed through the project. The costs of wind-generated electricity from these wind companies would be higher than those of conventional electricity generation, but utilities in three provinces (Hebei, Fujian, and Shanghai) were initially willing to purchase this wind power from the project developers, because the added costs of wind power were marginal relative to total utility revenue for these three large utilities. This willingness to bear the higher costs disappeared after power sector institutional changes. As a result, plans for 170 MW (out of an original plan of 190 MW) of wind capacity were cancelled. The general lesson suggested by this experience is that some explicit mechanism must be in place to finance the difference between renewable energy and conventional power generation costs. Merely relying on the power utility's willingness to bear the higher costs is not a sound policy.

34. Costa Rica. In Costa Rica, a significant private-sector wind-power industry has emerged from new dialogue and policy frameworks promoted by a World Bank/GEF project. The private sector installed a 20 MW wind farm and began operating it in 1997. Apparently, early project preparation activities, including institutional and technical feasibility studies, have engendered favorable perceptions and regulatory frameworks for

wind (including “iron clad” PPAs). Under the project, an additional 20 MW of wind power capacity has been installed.

35. A key lesson from Costa Rica is that regulatory frameworks, technology perceptions, and studies that address non-technical issues (and reduce non-technical risks) may be more important than mitigation of perceptions of technical risk through hardware demonstrations. This lesson is similar to that suggested by the Mauritius project described below.

Bagasse Power

36. Mauritius. A World Bank/GEF Sugar Bio-Energy project indirectly catalyzed dramatic changes in electricity generation in Mauritius. From 1994 to 1996, the project dispersed US\$6 million for efficiency investments in sugar mills to provide surplus bagasse for power generation. The project also provided TA and technology demonstrations to promote private/public sector cooperation in power plant ventures and evaluate ways to decrease the transport costs for bagasse and to optimize the use of sugar cane for power generation. This TA helped to formulate a framework for IPP development and an administrative focal point for private/public sector partnership in IPP development.

Small Hydropower

37. Sri Lanka. In Sri Lanka, the World Bank/GEF Energy Services Delivery project begun in 1997 points to the difficult and time-consuming nature of evolving business and regulatory models suitable to a given country and the flexibility needed to support approaches that show promise. The project financed more than 21 MW of small hydro by IPPs, along with a developing regulatory framework, including standardized power-purchase tariffs and contracts (PPAs). The key lesson from this project is that the power purchase tariff offered to IPPs must be carefully structured so that tariffs have some stability over time, and are able to pay for both the energy as well as the capacity that they provide, recognizing that power generation from renewable sources can vary significantly, depending upon nature.

Industrialized Country Experience

38. In 1998, with a view toward formulating lessons for developing countries, the Bank's Climate Change Team sponsored a review of the experience of several industrialized countries with renewable energy development. The principal findings of the review are as follows:

- The Renewables Portfolio Standard used in the United States is not suitable for developing countries. This scheme requires each retail supplier of electricity to include a specified percentage of renewable energy in its portfolio of electricity supplies, with individual obligations to be tradable.

- Another scheme used in California—the System Benefits Charges—is based on principles that are relevant for developing countries, but its administrative procedures are very complex.
- The Non-Fossil Fuel Obligation (NFFO) scheme used in the United Kingdom offers a good model for developing countries. Under NFFO, renewable energy power producers had to bid for subsidies in a competitive manner. A major weakness of NFFO was that its design favored large, deep-pocketed companies, who were in a position to bear the costs of project preparation for bidding, even though they were not in a position to estimate accurately their chances of winning, given the rapidly changing nature of the emerging market.
- The Electricity Feed Law (EFL), used in Germany, Spain, and Denmark, proved to be extremely effective in promoting renewable energy power generation. EFL sets a guaranteed premium price for the purchase of electricity from renewable energy. The power utilities are required to pay this premium price from their own resources, and have often resisted this requirement. A frequent criticism of EFL is that there is no pressure to reduce costs.

39. The framework to be developed in this project will take account of this experience, particularly NFFO and EFL, and propose an arrangement that maintains the cost-reduction pressures of NFFO while providing some assurances of the type offered by EFL.

G8 Renewable Energy Task Force

40. The Okinawa G8 Summit in 2000 created the G8 Renewable Energy Task Force to assess the barriers and to recommend actions to encourage the use of renewable energy in developing countries. Their main findings relevant to this project are as follows:

- Promoting renewable energy can be best done through enlarging markets, increased, focused R&D efforts, and stimulating the market environment in both developing and developed countries. Market creation would reduce costs and widen the provision of services. **These are primarily private sector activities within an appropriate regulatory framework** (emphasis added).
- Creation of widespread commercial renewable energy markets faces significant challenges: mobilizing private capital; developing and aggregating dispersed markets; extending financial services to the retail level; building business and maintenance infrastructure; and scaling up manufacturing. Together, actions taken to overcome these barriers will drive down costs and further increase market size.

Incremental Cost Matrix				
COMPONENT	BENEFITS/COSTS	BASELINE	ALTERNATIVE	INCREMENTAL
Renewable Energy Power Generation	Global Environmental Benefits	Insignificant progress towards <i>White Paper</i> target	Strong progress towards <i>White Paper</i> 10,000 GWh target; comprehensive, catalytic framework; and capacity to support renewable energy power generation	Jump start of renewable energy development; elimination of barriers that impede renewable energy power generation will accelerate investments, which will be financed outside this project
	Domestic Benefits	Job creation in emerging industry	Job creation in emerging industry	None
	Costs	US\$2 million government	US\$6.425 million government and GEF	\$4.425 million GEF
Commercial Solar Water Heating	Global Environmental Benefits	Private sector sales will continue at slow rate, with limited government support	Promotion program and support to companies under a “participating CSWH company program” will accelerate sales	Elimination of barriers will accelerate sales of CSWH systems
	Domestic Benefits	Private sector profits	Private sector profits	None
	Costs	US\$2.8 million, of which government US\$0.3 million, private sector US\$2.5 million	US\$10.875 million, of which government and GEF US\$1.875 million, private sector US\$9.0 million	US\$8.075 million, of which GEF US\$1.575 million, private sector US\$6.5 million

TOTAL	Global Environmental Benefits	Slow progress towards overall renewable energy target; 15–year cumulative value of CO ₂ emissions avoided by CSWH systems would be about 0.15 million tons	Accelerated progress towards overall renewable energy target; 15–year cumulative value of CO ₂ emissions avoided by CSWH systems would be about 1.15 million tons	<ol style="list-style-type: none"> 1. Increased direct progress towards overall renewable energy target; 15–year cumulative value of CO₂ emissions avoided by CSWH systems would be about 1.0 million tons. 2. Indirect effects would be about five times this, based on the estimated long-run contribution of CSWH, i.e., about 5 million tons CO₂ emissions, for a total of 6 million tons 3. Indirect effect on other renewable resources would be about three times that on CSWH, based on estimated contribution to target, i.e., about 18 million tons. About 10% of this would be in the project period
	Domestic Benefits	Job creation, private profits	Job creation, private profits	None
	Costs	US\$4.8 million, of which government US\$2.3 million, private sector US\$2.5 million	US\$17.3 million, of which government and GEF US\$8.3 million, private sector US\$9.0 million	US\$12.5 million, of which GEF US\$6.0 million, private sector US\$6.5 million

Annex 16: STAP Expert Review and Response
South Africa – Renewable Energy Market Transformation Project

UNIVERSITY OF CALIFORNIA, BERKELEY

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO



SANTA BARBARA • SANTA CRUZ

ENERGY AND RESOURCES GROUP
310 BARROWS HALL
UNIVERSITY OF CALIFORNIA
BERKELEY, CA 94720-3050
WWW: <http://socrates.berkeley.edu/erg>
FAX: (510) 642-1085

DANIEL M. KAMMEN
PROFESSOR IN THE ENERGY AND RESOURCES GROUP
PROFESSOR OF PUBLIC POLICY IN THE GOLDMAN SCHOOL
DIRECTOR,
RENEWABLE AND APPROPRIATE ENERGY LABORATORY
E-MAIL: kammen@berkeley.edu
TEL: (510) 642-1139 (OFFICE)
TEL/FAX: (510) 643-2243 (RAEL)

September 12, 2004

To: Ndesai@worldbank.org, smathur@worldbank.org
From: Daniel M. Kammen

Re: Review of GEF Project Renewable Energy Market Transformation Project (P078093)
(Revised Memo Based on 9-11-04 Comments and Clarifications provided by Nikhil Desai)

Summary:

This project seeks to build experience and remove barriers to the growth of renewable energy capacity within South Africa, and specifically within the large and generally successful utility, Eskom. The project goal is an excellent one: to expand the use of renewables—that are not required under federal law or under any international treaty to 4 percent (1,667 MW) of the estimated electricity demand by 2013. The project also could be coupled to several ongoing rural PV projects in South Africa (e.g. joint Shell-Eskom activities), but otherwise it is a sound plan,

and for \$6 million of international GEF support, is a highly effective way to assist one of the largest utilities to speed the introduction and grow the share of renewable energy used in their supply mix.

The most significant problem with the document is the lack of analytic analysis in Annex 15, the incremental cost analysis.

This project should be approved.

Major Comments:

Page 8: A clarification may be needed. On this page the PCD states that:

This project is expected to trigger significant private sector investments in renewable energy power generation; these investments will be financed *outside this project* by a combination of private equity and debt, with debt financing facilitated by an output-based revenue stream provided by external “carbon funds” such as the PCF.

This statement directly follows a paragraph/discussion of the solar water heater component of the project. Additional discussion and analysis is needed to back up this assertion. There are a number of counter-examples to this optimistic assessment, which may be true, but stands rather undocumented at this point.

Page 10: the statement, “For renewable energy, the conventional approach of the Bank, including GEF, financing renewable energy power generation investment was rejected.” This statement should be expanded and more fully explained.

Page 12: For rural grid productive uses, “There is limited concern about the sustainability and replicability of the frameworks developed under this component.” This statement is at odds with some of the experiences of rural communities in making use of electrical services that are focused on basic services (e.g. lighting) and luxury goods. A concerted effort is needed to make rural productive uses a widely useful operation.

Page 16: Presumably the plans to facilitate IPP or household power sales to the grid include discussion of net metering technologies. With very inexpensive dispatchable base-load coal the dominant form of power production, real-time pricing would not seem to be a particularly viable option.

Page 32. A number of potential project weaknesses should be discussed: issues with supporting rural productive uses; the very real potential that the 10,000 GWh target might not be met; the possibility that international Prototype Carbon Fund financing may not be available, etc....

Annex 15—Incremental Cost Analysis

The incremental cost analysis is not presented in a standard, or even suitably analytic framework. There is extensive discussion of global and national energy policies pertaining to carbon emission reductions, but there is relatively little in the way of analytic comparisons of realistic scenarios to grow the non-fossil sector within Eskom. This should be addressed by adding: a) a set of scenarios for ‘high’, ‘medium’, and ‘low’ renewable energy penetration rates (as a fraction of the 10,000 GWh; b) the need for a \$/tCarbon metric of avoided costs; c) a more complete analysis of the long-run avoided costs that Eskom will likely experience and how this could be used to build the clean energy market (through green pricing, investment incentives, etc ...).

This comment is withdrawn based on the explanation provided by N. Desai:

GEF procedures and rules require incremental cost analysis to underpin the activities being directly supported in the project, i.e., the two activities listed in para 3. While it is true that renewable energy power generation is more expensive than Eskom’s coal-based generation cost, no incremental cost analysis related to this is required in the project as this type of generation is outside the project, and no GEF funds are being provided for these investments.

Page 46. The long-run avoided cost of Eskom is listed at 3.5 cents in the text, yet at ~ 2 cents in Annex 15.

Page 47. A more complete discussion of the potential benefits of standards and codes—or on *voluntary* or third-party rating of systems—may be of particular value to this project. These mechanisms should be considered.

Minor Comments:

The PCD includes as a justification for the project the statement that within Eskom there is a, “lack of familiarity with international ‘carbon funds.’” This is somewhat odd; certainly this is possible, even likely, at a middle-management level, but at the division leadership levels, there is world-class experience in these areas. Perhaps a translation of this sentiment is that with a long history of experience with a long history of almost exclusively coal, that there is a strong reluctance to consider any (higher cost) alternatives. Eskom has, however, engaged in a number of renewable energy and low carbon projects, such as the Shell-Eskom photovoltaic effort mentioned above, as well as a number of earlier renewable energy efforts.

Page 5: Change, “Commercial solar water heating capacity installed.” to “The installation of commercial solar water heaters.”

Page 10 & 17. Lessons from other projects beyond the Indonesian one cited could provide crucial lessons, including both positive and negative lessons from the PVMTI effort, and the NRECA supported rural electrification efforts in Latin American. The conclusions from the recent World Bank report, *Productive uses of renewable energy A Review of Four Bank-GEF Projects* by Kamal Kapadia.

Page 14 & 34: The internal or external nature of the DBSA Audit is not specified.

Page 21: The Energy Development Research Center at UCT would seem to be a natural entity to be involved in the design of management and evaluation strategies for the project. It is recommended that they be consulted and potentially integrated into this process.

Page 23. The executive summary of the report by Conningarth Economists should be included in the document.

Page 25. More details on the potential or plans for the DME's green premium payment plan could be included. Given the low cost of electricity in RSA and the relative affluence of some of the population, this may be a key mechanism to develop IPP capacity and finance some of the initial renewable energy projects.

Page 40: Unclear sentence, "This project will not have any fiscal impacts on the project...."

IA Response to STAP Expert Review

Overall. The review is a strong endorsement of the project concept as well as the level of GEF funds sought for this project, with no major suggestions for change in the project design and key details. As such, it provides a strong foundation for GEF approval of this project.

Approval. The STAP reviewer approves the project, and states that “for \$6 million of international GEF support, [the project] is a highly effective way to assist one of the largest utilities to speed the introduction and grow the share of renewable energy used in their supply mix.”

Problems. The reviewer states that “the most significant problem with the document is the lack of analytic analysis in Annex 15, the incremental cost analysis.” It should be noted that the reviewer has withdrawn this comment, following some clarification by the project team.

Other comments. The review also contains a number of ‘major’ and ‘minor’ comments, most of which seek some clarification or additional information in the project document. All of these have been addressed fully in the revised project document, as shown below in detail.

Specific Reviewer Comments and Project Team Response

Major comments

Comment

Page 8: A clarification may be needed. On this page the PCD states that:

This project is expected to trigger significant private sector investments in renewable energy power generation; these investments will be financed *outside this project* by a combination of private equity and debt, with debt financing facilitated by an output-based revenue stream provided by external ‘carbon funds’ such as the PCF.

This statement directly follows a paragraph/discussion of the solar water heater component of the project. Additional discussion and analysis is needed to back up this assertion. There are a number of counter-examples to this optimistic assessment, which may be true, but stands rather undocumented at this point.

Response

There was no intention to assert that the solar water heater component would trigger investments in renewable energy power generation. The project document has been edited to avoid this confusion; see section B3 of the Project Appraisal Document.

Comment

Page 10: the statement, “For renewable energy, the conventional approach of the Bank, including GEF, financing renewable energy power generation investments was rejected.” This statement should be expanded and more fully explained.

Response

This has been done in the text. The conventional approach in Bank-GEF projects is to provide funds for both TA and investments. This is basically a TA project, and investments in renewable energy power generation will be financed outside this project; see section B3 of the Project Appraisal Document.

Comment

Page 12: For rural grid productive uses, “There is limited concern about the sustainability and replicability of the frameworks developed under this component.” This statement is at odds with some of the experiences of rural communities in making use of electrical services that are focused on basic services (e.g. lighting) and luxury goods. A concerted effort is needed to make rural productive uses a widely useful operation.

Response

No response is provided to this comment as this component does not feature renewable energy and is not being supported by GEF.

Comment

Page 16: Presumably the plans to facilitate IPP or household power sales to the grid include discussion of net metering technologies. With very inexpensive dispatchable base-load coal the dominant form of power production, real-time pricing would not seem to be a particularly viable option.

Response

These plans will be formulated during the project with GEF support. Net metering and real-time pricing will be considered at that time, along with other more attractive options.

Comment

Page 32. A number of potential project weaknesses should be discussed: issues with supporting rural productive uses; the very real potential that the 10,000 GWh target might not be met; the possibility that international Prototype Carbon Fund financing may not be available, etc....

Response

(i) No response is provided to this comment as this component does not feature renewable energy and is not being supported by GEF. (ii) While the target of 10,000 GWh is outside this project, a discussion about its achievability has been added to section C4 of the PAD. (iii) The availability of international Prototype Carbon Fund financing is outside this project; however, a discussion on availability of external carbon funds has been amplified in section C5 of the PAD.

Minor Comments

Comment

The PCD includes as a justification for the project the statement that within Eskom there is a, “lack of familiarity with international ‘carbon funds.’” This is somewhat odd; certainly this is possible, even likely, at a middle-management level, but at the division leadership levels, there is

world-class experience in these areas. Perhaps a translation of this sentiment is that with a long history of experience with a long history of almost exclusively coal, that there is a strong reluctance to consider any (higher cost) alternatives. Eskom has, however, engaged in a number of renewable energy and low carbon projects, such as the Shell-Eskom photovoltaic effort mentioned above, as well as a number of earlier renewable energy efforts.

Response

This point has been dropped from the revised project document.

Comment

Page 5: Change, “Commercial solar water heating capacity installed.” to “The installation of commercial solar water heaters.”

Response

Change made.

Comment

Page 10 & 17. Lessons from other projects beyond the Indonesian one cited could provide crucial lessons, including both positive and negative lessons from the PVMTI effort, and the NRECA supported rural electrification efforts in Latin American. The conclusions from the recent World Bank report, *Productive uses of renewable energy A Review of Four Bank-GEF Projects* by Kamal Kapadia.

Response

No response is provided to this comment as this component does not feature renewable energy and is not being supported by GEF.

Comment

Page 14 & 34: The internal or external nature of the DBSA Audit is not specified.

Response

This has been done.

Comment

Page 21: The Energy Development Research Center at UCT would seem to be a natural entity to be involved in the design of management and evaluation strategies for the project. It is recommended that they be consulted and potentially integrated into this process.

Response

This has been discussed with the government, and it has been decided not to involve any outsider in this design process, given the fairly straightforward nature of the monitoring and evaluation.

Comment

Page 23. The executive summary of the report by Conningarth Economists should be included in the document.

Response

Due to an oversight, this report does not include an Executive Summary, and hence it cannot be included.

Comment

Page 25. More details on the potential or plans for the DME's green premium payment plan could be included. Given the low cost of electricity in RSA and the relative affluence of some of the population, this may be a key mechanism to develop IPP capacity and finance some of the initial renewable energy projects.

Response

These plans will be formulated during the project with GEF support. No additional information is available now

Comment

Page 40: Unclear sentence, "This project will not have any fiscal impacts on the project...."

Response

This typographical error has been corrected.

Comment

Page 46. The long-run avoided cost of Eskom is listed at 3.5 cents in the text, yet at ~ 2 cents in Annex 15.

Response

This typographical error has been corrected.

Comment

Page 47. A more complete discussion of the potential benefits of standards and codes—or on *voluntary* or third-party rating of systems—may be of particular value to this project. These mechanisms should be considered.

Response

The text has been amended to reflect this concern.

Annex 17: GEF Secretariat and other Agencies' Comments and IA/ExA Response

South Africa – Renewable Energy Market Transformation Project

GEF Secretariat Review Sheet at pipeline entry

Comment: Further justification on the need for SHW subsidies in accelerating the market.

Response: See Annex B, Incremental Cost Analysis. The thrust of the subsidies is to provide indirect support to companies *via* overhead activities such as standards and promotion, and direct support *via* a Participating Company Program, which will make it easier for companies to do business with potential customers.

Comment: Further definition of market transformation activities for SHW, including promotion/awareness raising, codes and standards, and other activities which may be necessary beyond subsidies, such as business development and assistance for installers.

Response: These are defined in the Technical Assistance component of the project. In particular, a promotion campaign aimed at hotels and other large establishments is planned, and codes and standards will be developed in collaboration with the South Africa Bureau of Standards. Given South Africa's relatively mature commercial environment and technical capacities, it was determined that assistance to installers or business development services is not necessary.

Comment: A full discussion of the complementarity of this project with the UNDP wind power project, and how the two will integrate their efforts.

Response: Unlike the UNDP project, this project does not include financing for any investments in renewable energy power generation. However, the lessons learned from the UNDP wind power project will be reflected in the framework developed during the course of implementation for further projects that will help meet the 10,000 GWh target.

Comment: Lessons from GEF solar hot water projects in Morocco and Tunisia should be incorporated into the project design and described in the project brief for GEF Council. Lessons from the recent GEF report "The GEF Energy-Efficient Product Portfolio" are also relevant. Other power sector policy and financing lessons available from Bank/GEF projects in Sri Lanka (small hydro), China (wind/RPS), Mauritius (bagasse power generation), Costa Rica (wind), and India (wind) should also be incorporated in project design and referenced in the brief.

Response: This has been done.

Comment: UNDP comments on concept can mostly be addressed in writing the project brief. In particular, how the project design benefits from lessons and experience on grid PPAs and domestic SHW described in UNDP comments.

Response: UNDP experience on grid PPAs will be considered in the framework design. UNDP's lessons learned in setting standards for solar water heating will be utilized in this project.

GEF Secretariat Review Sheet at work plan entry

Comment: An endorsement letter by an unknown "GEF Coordinator" has been submitted that endorses the project proposal "Adoption of renewable energy by removing barriers and reducing implementation costs," dated January 6, 2005.

The title page still refers to the 2002 letter conditionally endorsing a "project to address the adoption of renewable energy by removing barriers and reducing implementation costs."

Response: This was simply an error on our part. We had already received the correct letter dated March 9, 2004, which is now attached.

Comment: It is still unclear, however, what is the long-term outlook for renewables in RSA (beyond the 10,000 GWh) and how the project contributes to it. In particular, no indicators to that effect are included in the log-frame.

Response: Please see pages 2–3 of the Executive Summary.

Comment: Financial viability remains problematic due to low background power prices. Please identify options.

Response: Please see page 8 of the Executive Summary.

Comment: The landfill gas potential in RSA will be more or less exhausted after this project. Please comment on the growth potentials for the other types of investments (not only for CSWH), and on the question to what degree self-sustaining market growth will be triggered by this project.

Response: Please see page 14, Annex A of the Executive Summary.

Comment: However, the number and quality of the indicators used for M&E is not sufficient. Please revisit. In particular, include indicators at least for the following:

- energy produced from installations
- cofinancing
- outputs for each subcomponent
- investments into on-grid renewables

Please ensure consistency between the various spots in the executive summary and project document that allude to the indicators.

Please ensure that the M&E provisions including the logframe follow GEF policies.

Response: Please see page 5, page 24 and Annex B of the Executive Summary.

Comment: Please include productive use component as "associated financing."

Please include all investments that are needed to attain the development or global environment objectives as "leveraged financing" if they are not tracked in the M&E framework.

Response: Please see cover page and table on page 9 of the Executive Summary.

Comment: The problem [of coordination with UNDP] is touched upon. Necessity for coordination is acknowledged. No specific coordinating activities are proposed.

Response: Please see page 11 of the Executive Summary.

Comment: Please clarify/improve indirect CO₂ savings, sum of direct CO₂ savings

Response: Please see cover page, Annex A, pages 21 and 27 of the Executive Summary.

Comment: How to reconcile the low electricity prices and the economic viability of grid-connected renewable power.

Response: Please see Section A1 on page 9 and Section C4 on page 24.