

**CTF PRIVATE SECTOR PROPOSAL  
SOLAR WATER HEATING COMPONENT  
A JOINT SUBMISSION FROM IFC & AfDB**

<i>Name of Project or Program</i>	South Africa Solar Water Heating Program (the “Program”)
<i>CTF amount requested (US\$):</i>	<ul style="list-style-type: none"> <li>➤ Investment – up to US\$47 million equivalent (US\$23.5 million for IFC’s account, US\$23.5 million for AfDB’s account)</li> <li>➤ Advisory services grant – up to US\$2 million (US\$1million for IFC’s account, US\$1million for AfDB’s account)</li> <li>➤ Implementation and supervision budget – US\$1.0 million (US\$500,000 for IFC’s account, US\$500,000 for AfDB’s account)</li> </ul>
<i>Country targeted</i>	Republic of South Africa
<i>Indicate if proposal is a Project or Program</i>	Program

**DETAILED DESCRIPTION OF PROGRAM**

***Proposal Context:***

This programmatic proposal is one of three IFC and AfDB joint Private Sector Proposals for South Africa under South Africa’s Country Investment Plan (“CIP”) which was endorsed by the CTF Trust Fund Committee on October 27, 2009 and allocated up to US\$150 million for flexible implementation to the private sector by IFC & AfDB. This proposal addresses use of CTF funds of up to US\$47 million for investments and US\$2 million for Advisory Services to support SWH projects alongside other financiers and / or public subsidy programs. There is a significant potential to reduce thermal energy consumption in South Africa through SWH, if product roll-out is implemented on a large scale, targeting not only households but commercial establishments such as hotels, hospitals, schools and government buildings.

The Program is consistent with the policies of the Government of South Africa (“GoSA”) and will directly support the GoSA’s specific goals of reducing electric power consumption by 12% (about 110,000 gigawatt hours (“GWh”)) from energy efficiency/Demand Side Management (“DSM”) by 2015. South Africa’s CIP identifies solar water heating as a key strategic area for application of CTF resources in both the public and private sectors.

***Country and Sector Context:***

South Africa is the largest contributor to GHG emissions in Africa. In 2000, emissions were 415 million tons of carbon dioxide equivalent (MtCO<sub>2</sub>e), placing South Africa as the 11<sup>th</sup> largest emitter globally. The country’s emissions per capita are about 10 tons of CO<sub>2</sub>/person, the eighth highest in the world. The energy sector is the single largest source of CO<sub>2</sub> emissions, accounting for more than 70 percent of the total. This is mainly because of South Africa’s heavy reliance on coal to meet its primary energy needs (75% of total energy consumption and 93% of power generation was from coal in 2004).

The GoSA is a leading voice in the developing world on climate change issues. It has committed to doing its part to stabilize global temperatures at 2 degrees Celsius above pre-industrial levels, as

recommended by scientific consensus. Recognizing South Africa's development needs, the climate change mitigation strategy the Government has adopted envisages an increase in greenhouse gas ("GHG") emissions over the short term, stabilized emissions by 2020-2025, followed by an emissions decline in absolute terms by mid-century.

### ***SWH in South Africa***

Most hot water systems in South Africa are electric "geysers" which consume as much as 40% of residential power, which in turn is 17-20% of national power use with a very high coincidence with peak power demand. South Africa's solar resource is excellent and SWH installation at scale offers potential for significant reduction of peak power loads. The development of the SWH market in South Africa has however been slow and limited (particularly in relation to other markets such as China which have seen huge growth and scale) as decisions to invest in SWH are based on the costs avoided due to reduced electricity consumption and, until recently, South African power costs have been historically low, with inexpensive and subsidized domestic fossil energy resources allowing customers to pay prices as little as R0.18/kwh (US\$0.024) (Note: average prices are closer to R0.4/kwh or US0.05/kwh). This must be compared to the current costs of residential systems which are in the range of 15-25,000 Rand (US\$2,000 - 3,300), varying with the size and complexity of the system.

Some SWH markets in South Africa are economical and commercially viable, with reasonable payback periods on investments of 4 to 7 years such that projects can be self-financing from energy cost savings or energy sales revenue. The market segments which best appear to meet this criterion are the hospitality industry, healthcare facilities, and new home construction. However, with the recent and planned increases in power tariffs, SWH economics should improve and the market is expected to pick up with a broader range of market segments becoming viable. Should the market grow as hoped the funding requirements will be enormous: estimates range \$1.0 billion or \$3.0 billion over the next 3 years assuming a unit cost of \$2,000.

The DME set a target for renewable energy to contribute at least 10,000 GWh of final energy consumption by 2013. It is estimated that solar water heating could contribute up to 23% of this target. In December 2009, the DME launched the South African National Solar Water Heating Strategy & Implementation Plan. This is an extensive contextualisation of SWH roll-out in the country. The DME set an initial target of 1 million solar water heater installations across the country by 2015. This target is to be expanded to 5.6 million installations by 2020. The DME notes that a national SWH program of this magnitude has the potential for saving 17,238 GWh while creating 46,000 jobs by 2029. In order to achieve these targets, extensive planning and research has been conducted nationally outlining funding models and implementation plans, global experience relevant to SWH application in South Africa, a programmatic clean development mechanism ("CDM") methodology for a national SWH program, the role of the insurance industry in a national SWH program and training and capacity building program for a large scale SWH roll out in South Africa.

Despite the seemingly extensive ground work by GoSA, uptake of SWH in South Africa is still limited. It is estimated that only 11,000 units were installed in 2009. The reasons for this slow uptake include: limited manufacturing and installation capacity, limited marketing spend by industry, limited local manufacturing, import tariffs on SWH systems, SABS testing bottleneck, the price differential between SWH systems and standard electric water heaters, the lack of financing for

manufacturers and consumers and as previously stated, the low cost of power which reduced the savings potential of SWH.

In an effort to ensure that low income households are included in the SWH drive the DME is looking to launch a new rebate system in place of the one currently managed by Eskom which is said to be difficult to access and slow to disburse. In June 2010 National Energy Regulator of South Africa (“Nersa”) published a consultation paper for public comment on the new Energy Efficiency and Demand Side Management (“EEDSM”) plan which included SWH. The consultation paper sets out the mechanics of the SWH rebate system which the DME is looking to launch by September 2010.

The highlights of the rebate system are: i) the rebate level will be set for the next three years (R0.5404/kWh increasing to R0.5795/kWh); ii) the saving per standard SWH unit is assumed to be 200kWh per month to be reviewed periodically, which translates to a rebate of about R108 per month for the first year; iii) the rebate payment period is 5 years; and iv) the total rebate over the 5 years is therefore estimated at about R6,500 per SWH unit compared to a cost of about R15,000-R25000 depending on the size of the unit.

#### ***Barriers to Private Sector participation in SWH:***

Depending on the cost of power purchases avoided, SWH investments can have attractive economic and often also financial rates of returns (even though investors often lack confidence in the expected economics of such investments) but have to date failed to meet the investment thresholds of investors. Barriers to private sector scale up of the SWH market include:

#### **Consumer related barriers**

1. Commercial, industrial and domestic consumers are generally ill-informed about the operating cost benefits of SWH systems and their energy savings potential. Capital expenditures are typically made to replace old technology, to increase capacity and to upgrade technology from a quality perspective but few entail switching from traditional water heaters to SWH. Most companies are not aware, and do not base their investment decisions on the potential energy savings that can be achieved from each new investment. Generally the level of awareness about potential SWH improvements is low in South Africa, despite the fact that the government has announced energy efficiency /demand-side management as one of its priorities. Consumer scepticism about the reliability of the technology: consumers are generally of the opinion that SWH technology performance is sub-optimal compared to the cheaper traditional electric or gas water heating systems. This view is especially prevalent among institutions such as hotels who believe that the nature of their business does not permit them to take a risk on SWH. This is despite successful implementation in countries such as Israel and Tunisia
2. For non-energy intensive industries, energy efficiency projects including SWH projects that are independent of larger capital investment programs are often small in nature. As a result, the attractive returns from such projects fail to catch the attention of management given their limited impact on the overall bottom line of the company. For smaller commercial and residential customers that do not think in terms of returns, the payback period on cost savings must be short and to date the low power tariffs in South Africa have made pay back periods too long to persuade mass take up of SWH.

### **Market related barriers**

1. Capital costs are prohibitive and given the lack of confidence many investors have about the economics of SWH investments, many view the Eskom Rebate of 20-25% as inadequate.
2. There is a lack of suitable financing available. Typically financial institutions assess companies on their past financial performance and do not consider the expected improvement in financial performance (reduced costs) which results from the new energy efficient equipment. As a result, financing terms can be restrictive and unattractive for borrowers. In addition, companies with limited investment funds are often seeking off-balance sheet solutions which are not currently available in the market.
3. Financial institutions in South Africa are hesitant to provide SWH financing as a specific product line since they associate such funding with higher transactional costs as a result of their lack of experience with the technologies and market opportunities, and the need for a more specialized approach. FIs will point to complicated reporting requirements with technical details as one component of the increased costs for them and their clients. Additionally, banks do not typically have internal resources to evaluate such reporting from their clients and don't have scoring systems adjusted to the additional requirements; nor are their marketing staff trained to provide detailed product information or identify clients that are appropriate for energy efficiency projects. As a result of these hurdles, real and perceived, financing at fully market rates does not provide banks with a sufficient return to venture into the "energy efficiency" line of business. The financing that is available to suppliers and consumers is of relatively short tenor, resulting in high monthly payments.
4. Historically low electricity tariffs have resulted in consumer apathy to energy costs. This explains some of the disinterest and lack of awareness of energy saving equipment like solar water heaters. As electricity tariffs continue to creep up, this situation is expected to change.
5. The useful life of a solar water geyser is about 7.5 years which is relatively short considering the high capital cost. This reduces the period over which the capital cost can be amortized and reduces the economic advantages of SWHs over electric geysers. Limited suppliers and manufacturers who only offer what is considered by customers as a short guarantee on the equipment (up to 5 years). Most are relatively new and the market is concerned they may not be around in 5-10 years time to honour their warranties or offer service.

### **Barriers to be address by the Program**

A number of the above mentioned barriers cannot be addressed by the Program, however, CTF funding will be used to overcome the following market related barriers:

1. High costs: the Program will seek to facilitate a reduction in unit capital costs by allowing the supply chain to achieve economies of scale; and
2. Availability and terms of financing: the Program will look to improve the economics of SWH ownership by supplying efficient and affordable financing for suppliers and consumers, extending tenors and lowering costs.

### ***Program Summary:***

The proposed program represents an IFC and AfDB joint initiative to support the implementation of SWH projects to be implemented by commercial and industrial users and potentially private households through initiatives led by municipalities (local governments). The program will comprise but not be limited to at least the following: i) financing end consumers through intermediaries such as municipalities, ESCOs or FIs; and (ii) provide long term finance to SWH

manufacturers through FIs. IFC/AfDB's private sector SWH initiative is addressing the support needed by SMEs, the commercial, industrial, and municipal sectors in the scale up of SWH projects in South Africa. The proposed program will catalyze the SWH market by promoting the provision of SWH equipment at more affordable prices and with appropriate financing available to consumers.

***Flexibility:***

Given the dynamic environment, both with regard to the evolution of the regulatory environment and with regard to development readiness of different private sector investments, the Program will seek to retain flexibility (in terms of approach, borrower selection, and application of CTF funds) in structuring the best way to accelerate the implementation of SWH funding. The financial instruments, their pricing and terms of the CTF funds offered to borrowers will be tailored on a case-by-case basis to address the barriers identified for each borrower type. IFC and AfDB will seek to provide the minimum concessionality necessary to catalyse the market. In our view this approach will lead to the creation of a sustainable SWH sector in South Africa and will ultimately enable a greater capacity of SWH to be developed in South Africa in the medium term promising long-term answers for South Africa's power needs

Final agreement to provide CTF funding to any individual borrower would be subject to a full due diligence and approval by an internal IFC or AfDB approval body as well as IFC or AfDB's Board, per the CTF private sector guidelines.

***Use of CTF funds:***

IFC/ AfDB are looking to blend CTF funds with their own funds to roll out the program. The proposed Program will stimulate the development of local solar heater manufacturers, facilitate increased use of SWH by commercial and domestic consumers and increase SWH awareness throughout the country. Whilst reaching households will be a fundamental component of this program, reaching large commercial and industrial establishments such as hotels will be equally important.

The Program is expected to help catalyse an exponential demand in SWH across all market segments in South Africa. Without CTF, IFC/ AfDB would not be able to provide resources with the terms and in the quantity needed to achieve meaningful transformation.

- (i) *Financing manufacturers - Providing long-term finance, through FIs, to local manufacturers to expand / construct plants and/ or provide vendor finance*

For SWH to be successfully implemented in South Africa, it will be important to ensure that the supply market is adequately developed. There are currently few registered suppliers with limited capacity of which very few are manufacturers. Locally manufactured units tend to be cheaper than imports and would have the added benefit of locally available support services. However, the capital to set up local manufacturing and assembly plants is scarce. It will be important to establish a few large manufacturers in the country capable of large scale manufacturing, assembly, installation and service of SWH systems to facilitate the roll out of a meaningful volume of SWH systems.

CTF funds will be provided to manufacturers through FIs, at concessional rates and blended with IFC/AfDB resources (long term equity and / or debt) to offer below market rate loans for expansion

or greenfield projects. Local production coupled with cheaper financing is expected to reduce the cost of SWH units so that they are a more affordable and attractive investment for consumers. IFC would also be able to tap into its global client network for best practice guidelines or technical partners for local manufacturers. As the sector develops and demand for SWHs increase it is expected that additional manufacturers would enter the market without subsidies.

The above initiative will not only result in affordable SWH units but will also contribute additional benefits to the economy such as employment creation and large scale development of an industry in the country.

- (ii) *Providing long-term finance to end-consumers through intermediaries such as municipalities, ESCOs or FIs*

Several municipalities are developing or keen to develop and implement residential SWH finance programs. Municipal projects currently under operation and development include the City Power Johannesburg program; and the eThekweni program. Other potential municipalities include Ekurhuleni, Tswane, Nelson Mandela Bay, and Cape Town. The optimal approach would be to develop a structure with one of the municipalities that is already working on a SWH strategy with a view to replicating this across country.

The Program will not only consider financing consumers through municipalities but also through ESCOs and FIs. Municipalities are, however, key as they distribute approximately 50% of the power in country, and cover a large portion of the residential and commercial end-user sectors. They therefore have the billing relationships with end-users and can act as aggregators, buying, distributing and financing SWH installations at scale. The residential sector accounts for about 17% of power consumption and about 30-40% of this is for hot water with a strong coincidence with peak demand. Utility-based SWH programs, where the municipality or ESCO acts as a market aggregator, provides financing to customers and collects payment through the utility bill, are being considered, however, the municipalities and ESCOs need assistance in developing the appropriate financial structures.

In conclusion the Program will use CTF concessional financing to enable the SWH programs outlined above. The concession will be passed through to the end-users, thereby improving the economics of SWH ownership. The CTF funds will be combined with IFC/ AfDB funding instruments to provide optimal value to consumers and manufacturers. It is expected that as the benefits of SWH become more apparent in the market (through CTF's initial interventions) end user demand would increase and subsidies would begin to play a lesser role in the decision making of future clients because the economics and performance of the equipment would be proven. At the same time, FIs would have developed lending products for SWH's making them more accessible to end users. The growth in the sector would then encourage additional manufacturers to enter the market further reducing costs and improving the economics of the sector.

### ***The Investment Component***

Through the Program, IFC and AfDB will provide a combination of their own and CTF financing directly and indirectly to commercial/ industrial establishments, manufacturers and municipalities, energy service companies ("ESCOs") or financial intermediaries ("FIs") respectively, on terms

necessary to address the barriers outlined earlier and to catalyze uptake and scale-up of SWH in the country. Once the first few SWH projects are operating successfully and efficiency and reliability of solar water heaters demonstrated, the financial attractiveness of solar water heaters is expected to catalyze the consumer and supply market which will eventually work with no CTF support.

***Terms of the CTF funds***

Concessional Interest Rates: CTF funding will be offered at a concessional interest rate to provide the incentive consumers need to convert to or purchase SWH units or manufacturers to expand or set up new plants in the country. Concessional interest rates will be seen by the consumers and manufacturers as a hedge against entering such a “risky” sector and will directly improve the economics of SWH ownership relative to ownership of an electric geyser. The exact interest rate, tenor and amount of the CTF component of any loan will vary based on the specific needs of each consumer category and size and scale of manufacturer.

During the investment period an advisory program will be used to maximize the transformational impact of the projects financed by allowing the lessons learned to be shared with the market and by providing grant funding to address smaller scale barriers that are common to the market.

***Advisory Services:***

The advisory services component will be coordinated with technical assistance and capacity building program that is currently under development by IFC: the Africa Renewable Energy Access Advisory Services (AREAS) Program, a 3-year, US\$3m program that will be piloted in South Africa and then rolled out to other sub-Saharan countries. It will include knowledge sharing activities that ensure the learning and information generated through these initial projects is shared with future developers, financiers and government bodies, as outlined below:

***Capacity Building and Knowledge Management:***

Advisory services will provide market information and assessment tools to demonstrate the economic case for SWH and reduce the cost of rolling out SWH programs via municipalities, financial intermediaries (FIs), ESCOS or directly at large industrial and commercial sites (e.g. hotels). Depending on the specific investment projects to be pursued, such capacity building could be directed at FIs, municipalities and/or corporate sub-sectors. For example, investment programs with financial institutions could be complemented with market sizing and segmentation information to make the case for setting up energy efficiency programs and with specially tailored tools to support FIs in assessing particular SWH loans. Large commercial and industrial sub-sectors, such as the hotel sector, which have to date been reluctant to invest in SWH due to quality and performance concerns could be supported through documenting case studies of successful programs in other countries (e.g. Israel, Tunisia) and through the development of performance specifications (such as those already available in other countries). Similar data could also be shared with the regulator and the government to support any public information campaigns. See annex A for a more detailed description of the advisory services to be offered.

***Describe the Proposal’s strategy for achieving market transformation:*** The combined IFC/AfDB Program is expected to result in a lowering of SWH unit costs and increasing uptake by reducing payback periods through appropriate financing mechanism. Consumer opinion on SWH is expected

to be positively influenced so that SWH is viewed as an integral part of operating efficiency with real cost saving benefits for the hot water consumer. The Program is a long-term effort to catalyse the SWH industry in South Africa. By making SWHs a known and trusted product in South Africa it is expected that end user demand would increase and subsidies would begin to play a lesser role in the decision making of future clients (because the economics and performance of the equipment would be proven). At the same time, FIs develop lending products through the CTF program which would increase access to finance for SWH units making them more accessible to end users. The growth in the sector that would result would then encourage additional manufacturers to enter the market further reducing costs and improving the economics of the sector.

The Program is consistent with the policies of the GoSA and with South Africa's Country Investment Plan (CIP) which was endorsed by the CTF Trust Fund Committee on October 27, 2009. The Program will directly support the GoSA's national targets for energy efficiency improvement (12 percent by the year 2015). South Africa's CIP identifies SWH as a key strategic area for application of CTF resources in both the public and private sectors.

IFC and AfDB will leverage their deep, international experience to support the SWH sector in South Africa. IFC and AfDB will apply innovative structuring to apply CTF funds in the most effective and efficient manner with minimum concessionality to address the key barriers that are preventing progress of private sector investment in SWH.

#### **FIT WITH INVESTMENT CRITERIA**

##### ***Potential GHG Emissions Savings:***

Based on NERSA's assumptions of 200kWh per month savings from an average SWH unit and assuming a carbon intensity factor for South Africa of 1.02 tCO<sub>2</sub>e/MWh, the Program would result in annual emissions savings of 290,000 tCO<sub>2</sub>e. Assuming the average life of a SWH is 7.5 years the total emissions savings resulting from the Program are estimated at 2.17m tCO<sub>2</sub>e.

If the Program can provide demonstration and result in replication in the order of 5x, the Program could result in further indirect annual emissions savings of 1.45m tCO<sub>2</sub>e per year and 10.86m tCO<sub>2</sub>e in total.

##### ***Cost-Effectiveness***

Based on the above calculations and an expected Program cost of US\$50m, the implied direct GHG reductions per CTF dollar spent will be 0.05 tCO<sub>2</sub>e/\$ and the implied indirect GHG reductions per CTF dollar spent will be 0.23 tCO<sub>2</sub>e/\$.

##### ***Demonstration Potential at Scale***

As described in the Country Implementation Plan, the energy efficiency potential in South Africa is vast, and so is the *replication and scalability potential* of SWH subsector interventions. If the interventions described above lead to realization of the National Energy Efficiency Strategy (e.g., 12 percent reduction in business-as-usual electricity consumption to 2015), this would represent an annual primary energy savings of 400 Petajoules, or an annual electricity savings of 110,000 GWh. If this goal were achieved, it would represent an annual reduction of 30,000 GWh – three times the energy efficiency goal of Eskom's five-year DSM plan. The equivalent lifetime carbon savings would be well over 200 Mt CO<sub>2</sub> equivalents.

***Development Impact***

The expected benefits achieved by the Program include:

- More rapid and broad-based scaling-up of SWH investment in South Africa. By providing easier access to financing and equipment, increasing confidence in the reliability and efficiency of SWH and additional technical assistance SWH investments will scale up at a much faster pace. The Program's support in the development of SWH equipment will help product manufacturers scale up their operations which in turn will result in increased SWH deployment in the country. Long term funding that will be provided to manufacturers, commercial and industrial consumers and municipalities through the Program will enable them to aggressively implement solar water heating projects.
- By accelerating the development of the SWH sector and supporting its achievement of critical scale in South Africa, the Program will open up opportunities for potential future energy efficiency equipment manufacture in South Africa with its associated employment benefits.
- Improved Competitiveness of the equipment suppliers: The implementation of the program, in particular assistance to the manufacturing sector is expected to drive SWH equipment prices down making them more affordable to even the low income households and smaller businesses.
- Employment creation through installation and servicing as well as manufacture.
- Reduced energy usage in an energy constrained country.

***Implementation Potential:***

See description above regarding South Africa's energy efficiency market for details on the market context. This project, along with other World Bank/AfDB CTF related interventions is expected to help the GoSA implement its LTMS.

***Additional Cost & Risk Premium***

The interest rate, tenor, and amount of the CTF senior loan to be provided under the Program will reflect the need for subsidies but also current market conditions. CTF funding will help overcome barriers to market transformation for the Program.

***Financial Sustainability***

By offering concessionary priced funding with longer maturity and capacity building, the Program will establish a track-record for the viability of commercial financing for SWH projects and will play a significant role in accelerating market development to achieve economies of scale. Once the initial beneficiaries of the program develop their internal capacity and see the cost benefit of SWH they are expected to continue converting to or implementing SWH projects without the need for further subsidies. The increased market will make the equipment manufacturing a profitable business that will also eventually not require subsidies. The announced increases in Eskom's power tariffs along with cost reductions of the SWH units with the achieved economies of scale will increasingly make SWH investments more attractive further eroding the need for concessionary priced funding.

***Effective Utilization of Concessional Finance***

Given the relative skepticism about the benefits and reliability of SWH as well as the high costs and long payback time frame it is unlikely that a meaningful roll out of the program as envisaged by the government could be effected without some concessionary finance to help change these perceptions and reduce costs and payback period. The proposed projects would not be undertaken if the

concessional finance portion (interest rate subsidy) is missing.

***Mitigation of Market Distortions***

The proposed Program will not distort the market, since it will not be displacing any private sector investment and will be acting in concert with GoSA initiatives to provide other incentives for this nascent market.

***Risks***

Risks associated with the Program include:

- **Market Awareness:** South Africa still lacks a sufficient level of market awareness for energy efficiency investments including SWH and support is limited on the private level. Therefore, consumers have low level of motivation to undertake such investments.

*Mitigant:* The new Eskom investment strategy, related tariffs, and regulatory measures as well as the proposed DME SWH rebate program provide stronger support for SWH initiatives. In recovering from the local recession, companies will be attracted to the monetary savings afforded by SWH investments. Finally, the program itself will provide basic market awareness activities and will work to motivate the SWH stakeholders.

- **Entry into SWH Market:** SWH is a relatively new or insufficiently tested market segment in South Africa. There is no clear leader who is spearheading the industry and banks are hesitant to lend to the few players that have decided to enter the market.

*Mitigant:* The combined offer from Development Banks and CTF is expected to catalyse the market and help dispel fears of the riskiness and expensiveness of SWH. A few successful projects will have significant demonstration effect.

## **Annex A:**

### **PROPOSED SCOPE OF ADVISORY SERVICES**

IFC & AfDB have learned from experience that targeted advisory support can further accelerate the development of a country's solar water heating ("SWH") sector by creating an enabling environment for future and parallel investments, alongside target setting and price regulation. To ensure that the market has the adequate support necessary to catalyze growth, IFC & AfDB will develop and promote an advisory services program to challenge core market issues and barriers to entry.

The SWH Advisory Services ("AS") component fits into the Africa Renewable Energy Access Advisory Services ("AREAS") Program that will launch in September 2010 to run for three years with a two-year post program completion phase. AREAS seeks to support the creation of a sustainable renewable energy financing market, through analysis and development of business and financing models, with capacity building support targeting the replication of successful models trialed in the marketplace. AREAS is dedicated to retail level renewable energy project development and will be able to recruit specialized technical experts to run the SWH AS project.

South Africa has been identified as the pilot market for the AREAS program, notably due to the existing regulatory and financial support, in an attempt to mitigate the risk that current national policy and the financial environment would not support the required investment in to economically feasible renewable energies, such as SWH. Further, the SWH AS component will support and compliment the main thrust of the Clean Technology Fund ("CTF") SWH program aimed at mitigating high financing costs and long payback periods. It is essential that the SWH advisory services provide both technical and financial access support to the various intermediaries highlighted under the SWH AS capacity building discussion (FIs, corporates in selected sectors, ESCOs and municipalities) whilst helping to creating an enabling regulatory environment which includes increasing market awareness. Advisory services must be well coordinated with IFC's investment activities as well as the country policy developments that are ongoing in South Africa on a national and local scale; to yield visible results. The SWH AS component could potentially be designed to include two main elements, capacity building and knowledge management. The design phase discussed in the next section will be used to refine this component.

#### **a) Capacity Building**

Providing market information and assessment tools to demonstrate the economic case for SWH and reduce the cost of rolling out SWH programs at financial institutions (FIs) or large industrial customers (e.g. hotels). Depending on the specific investment projects to be pursued, such capacity building could be directed at FIs and/or corporate sub-sectors.

For example, investment programs with financial institutions could be complemented with market sizing and segmentation information to make the case for setting up energy efficiency programs and with specially tailored tools to support FIs in assessing particular SWH loans.

Large commercial and industrial sub-sectors, such as the hotel sector, which have to date been reluctant to invest in SWH due to quality and performance concerns could be supported through documenting case studies of successful programs in other countries (e.g. Israel, Tunisia) and

through the development of performance specifications (such as those already available in other countries).

The capacity building program could also be aimed at enhancing the municipalities and ESCOs ability to (a) develop bankable models; and (b) prepare the procurement documents and conduct the procurement process. This would be done on a wholesale basis with the municipalities and ESCOs ultimately taking responsibility for producing their own models and running their own procurement processes. This approach will help ensure that municipalities will be able to perform these functions even after IFC AS is withdrawn.

**b) Knowledge Management:**

Disseminating lessons learned and non-confidential information obtained from early projects to regulators, project developers, and the wider stakeholder group can be an effective way to promote a better regulatory/market environment and reduce perceived risks for future project developers, consumers and manufacturers. Transparency, monitoring and evaluation, and knowledge management are all key elements of the CTF supported projects and a knowledge management program would be developed to ensure an effective feedback loop is created to capture and share information while managing and balancing the confidentiality requirements of the projects and developers in question.

**Design Process**

The AS program will complete the following initial steps, in order to assemble a thorough awareness of the state of the marketplace and how best to compliment and leverage the successes of other IFC & AfDB initiatives. The results of these steps will be used to inform the final design of the AS component. The market assessment will be financed with the funds allocated to AS and will benefit from all previous analytical work on the market performed by GoSA, DBSA and other.

1. Assessment of key barriers to customer uptake and market entry by manufacturers in South Africa.
2. Outline of past and current national and council-level programs established to support the rollout of SWH in industrial and commercial markets. Examples of such initiatives of note are the Department of Mineral and Energy’s program, spear-headed by the Central Energy Fund (“CEF”), in Gauteng, Western Cape and KwaZulu-Natal; and the “South Africa SWH Clean Development Mechanism Project” being rolled out by ETA Energy, CEF Carbon and the Nelson Mandela Bay Municipality (“NMBM”). These initiatives are described in more detail below.
3. Outline of national standards and legislation relevant to the growth of the SWH market, such as building sector policies and tariff reforms.

**Expected Areas of Intervention**

The advisory services program will aim to reduce customer related barriers and support financial institutions, corporate, ESCOs and municipalities through capacity building and knowledge management, in dealing with market related barriers. This section presents possible interventions.

#### a) Support to Municipalities and Government

The IFC advisory services will address customer related barriers through three main activities.

The first activity will aim to support the Government, Eskom and financial sector with ongoing marketing, promotional and educational programs to inform and educate all levels of customers (residential, commercial and industrial) of the benefits and costs associated with SWH and remove some of the current misconceptions regarding the technology.

The second activity to reduce customer related barriers would aim to support regular market assessments covering both the state and structure of the industry as well as the number and sectors of installation. Lack of proper market information is regularly cited as one of the causes behind the uncertainty regarding the actual supply and installation capacity in the market and the level of uptake by the different market segments.

Focused assistance in knowledge management could be provided at the Government level and to municipalities developing draft legislation and policies that enforce installation of SWH. Critically, this must be done in coordination with creating supporting financial assistance models to the customer and manufacturing bases.

Public bodies can reinforce the success of policy through the complimentary provision of business information, training and consulting services to private dealers and ESCOs, together with a widespread campaign targeting residential consumers and vendors; the AS program can assist in developing these services and marketing capabilities.

Case examples of policy-driven attempts at retail market expansion include the City of Cape Town's building 'code' that preserves an objective target of energy savings through SWH. It has been identified in international assessments of building sector policies for its successes in driving market transformation and strengthening. A By-Law drafted in January 2010 by the City of Cape Town ("Energy Efficient Heating Water By-Law") states that all new buildings and extensions requiring water heating must use solar or other types of energy efficient heating to assist in managing peak power demand.

In parallel, at the national level, the Government is in the process of putting through an amendment to building regulations that requires any building to source 50% of its energy demands from a renewable source (that includes water heating).

Following the comments phase the amendment will be gazetted. It is envisaged that a subsequent training phase of sufficient length of time would be needed to ensure local building inspectors are able to implement this requirement.

#### b) Support to Other Intermediaries

Efforts by the AS to deal with market-related barriers could include a capacity building program aimed at enhancing the capability of municipalities, financial institutions and ESCOs to (a) develop bankable models; and (b) prepare the procurement documents and conduct the procurement process.

This would be done on a wholesale basis with these organizations ultimately taking responsibility for producing their own models and running their own procurement processes. This approach will help ensure that municipalities will be able to perform these functions even after IFC AS is withdrawn.

Assistance to financial institutions in dealing with market related barriers to service low-, medium- and high-income communities would cover the following format:

Phase I (4-6 months):

- a. Portfolio review – to identify potential SWH clients
- b. Initial briefing of bank officers about the technology, products and case study projects in operation
- c. Assessment of SWH financing opportunities and identification of potential projects for selected clients to demonstrate the process and business size
- d. Preliminary product development based on outcomes of the above assessment

Phase II (4 months)

- a. Development of a product description and implementation manual
- b. Training for key front- and mid-office staff
- c. Development of promotion materials and activities
- d. Transaction support and handholding of financial intermediaries through initial deals
- e. Progress review meeting and report on results

### **Case Studies**

(a) The Department of Mineral and Energy's program to rollout SWH is underway, focusing on mid- to high-income households in Gauteng, Western Cape and KwaZulu-Natal. It is being spearheaded by the Central Energy Fund ("CEF"), in collaboration with the South African Bureau of Standards ("SABS") and acknowledges progress and developments in the demand side management program in progress at Eskom. The outcomes so far include the creation of a National Standard (SANS 1307) for SWH systems and a Code of Practice (SANS 10106) by SABS.

The determination of the most recommendable financial models to aid the SWH industry stems from monitoring of 500 SABS certified systems installed in Cape Town, Durban and Johannesburg.

(b) The South Africa SWH Clean Development Mechanism Project being rolled out by ETA Energy, CEF Carbon and the Nelson Mandela Bay Municipality ("NMBM") has the objective of promoting the uptake of SWH systems and reduce greenhouse gases emissions to the atmosphere.

The Clean Development Mechanism ("CDM") is part of the UN's Framework Convention on Climate Change (UNFCCC), created to allow for developed nations compliant to reducing national emissions levels to offset through investing in emissions-reduction projects in participating developing nations. During April 2010 public meetings were held to provide

stakeholder awareness and participation to assist project developments alongside the CDM process. ETA Energy will roll out a national SWH program that will be implemented first in NMBM.

c) The SWH program that has been run in South Africa by Winrock in partnership with USAID between 2004 and 2006 illustrates some of what can be achieved across all activities outlined above to create customer demand, appropriate technology and financing to low-income communities, developed in partnership between local public and private financial organizations (the Development Bank of South Africa and Ithala Bank). The program focused on providing the most appropriate delivery and quality-assurance mechanisms, to keep prices low and system reliability high.

Winrock worked with housing authorities, energy utilities, financiers, and equipment suppliers to develop quality-assurance plans, consumer-awareness campaigns, and lending programs to provide low-cost, reliable solar water heaters to as many low-income households as possible. Several municipalities expressed interest in adopting the technology in low-income areas within affordable housing programs and have seen successful implementation. A 100-home pilot project was run in Durban with the Metro Housing (eThekweni) authority following an end-user evaluation program in Ivory Park, Johannesburg.