



ENERGY OFFICE

eThekweni. The green economy hub.

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14th December 2011

REQUEST FOR QUOTATIONS

Management of eThekweni Low Cost Solar Water Heater Program

1. Background

1.1 National Solar Water Heater Policy Context

South African National Solar Water Heating Strategy & Implementation Plan (November 2009) provides a national strategic framework to ensure that 1 million solar water heaters are installed across South Africa. The national SWH Strategy was developed in response to the goals of reducing electricity demand, offsetting rising electricity cost to residential households, accelerated water heating service delivery, particularly to low income and indigent households and achieving renewable energy targets of 10,000 GWh contained in the 'White Paper on Renewable Energy' of 2003.

The national SWH strategy provides a detailed market assessment and segments the market into existing residential users of hot water, failure related geyser replacement (insurance linked), industrial uses and commercial buildings/processes and public and private users. The strategy also notes the critical role that government must play in driving the market by noting that "this is a 'public access' to essential service and market creation programme since lower income households (>75% of total SA households) are currently unserved". The strategy also lists a number of business model principles that local municipalities can consider when developing their own SWH strategies. However, the strategy also notes that "final agreements on business case and funding streams in process".

1.2 eThekweni Municipal Solar Water Heater Policy Context

The eThekweni Municipality Environmental Management Department (EMD) commissioned a study In June 2007 that would enable eThekweni Municipality decision makers and officials with the proper technical guidance on the potentials of renewable energy (RE) technologies appropriate for the city. "A catalogue of renewable energy sources fit for eThekweni" short-listed six renewable energy technologies and provided specific recommendations (proposals) for implementation for these different technologies. Of all the possible RE technologies assessed the top two priority interventions were listed as:

1. Implement separate low-income and middle-income *solar hot water* projects, the former to be based primarily on applications to new (RDP) housing, and the latter primarily on retrofits of existing housing; use programmatic CDM and the newly-announced Eskom DSM programme for solar to reduce costs to the municipality and the end-user.
2. Implement a *solar hot water* project for commercial/institutional buildings, starting with the municipality's own building stock and treating this as part of an overall energy audit process to ensure that solar is implemented rationally as part of an overall savings package.

This focus on solar water heating was again articulated in the eThekweni Municipality Energy Strategy, 2008 (adopted by Council Dec 2009). The Energy strategy lists a number of action plans which span a wide range of technical, managerial and institutional interventions to deliver Energy Efficiency (EE) and Renewable Energy (RE) improvements across all sectors. Two of the action plans are dedicated specifically to Solar Water Heating, namely:

1. Residential Sector Action Plan 7 - Enhanced use of Solar Water Heating in the Home
2. Local Authority & Public Sector Action Plan 10 - Maximize use of Solar Water Heating in Public Buildings.

Both of these action plans list a number of actions which need to take place, responsible agents and timeframes in order to increase the uptake of solar water heaters in the municipality. One of the most critical actions identified in the energy strategy is to develop a comprehensive financial model for large scale SWH roll-out.

1.3 Low Cost Housing Solar Water Heater Model

With the finalisation of the ESKOM subsidy for low pressure SWH units, it has been possible to design a low cost housing SWH intervention that has no direct cost to the household or the local municipality. The SWH are, in effect, installed free of charge and can be financed from a combination of the ESKOM subsidy and Carbon Credits (through the CDM). It is also possible in some circumstances to access a portion of grant funding, which will go towards a maintenance and capacity building "add-on" to the project. This could include establishing a SWH kiosks and awareness raising programmes in the allocated areas.

1.4 Project Technology

The technology used for the program are low pressure 100-125 litre solar water heaters (SWHs) with no electricity back-up. Each installation will include the following components:

- Solar collector (evacuated tube or flat bed) with a with a collector area of approximately 0.9 m²
- 100-125 litre stainless steel/galvanised steel or glass fibre tanks.
- SWH support stand.
- Water feeder tank.
- Plumbing connection to building hot water distribution system.

It is important to note that there is no electrical backup, heating element or battery involved in the unit. The SWH uses thermal energy from the sun to heat water and does not in any way generate or store electricity.

2. Project Stakeholders

2.1 Management

The program falls under the responsibility of the Human Settlement and Infrastructure cluster in the eThekweni municipality. The program is being managed by the eThekweni Energy Office, in collaboration with Eskom, the eThekweni Housing Department and eThekweni Water and Sanitation Department

2.1.1 Service Providers

Currently four private sector Solar Water Heater Service providers are on the registered panel for the eThekweni Program. The service providers play a critical shared management role. They take responsibility for supply and installation, training, local employment, administration and some monitoring and verification. They also access the Eskom subsidy on behalf of the programme and co-manage the carbon finance. The service providers also conduct awareness raising programs in the community.

The four service providers are SASSA/TASOL, Universal Solar and Eco Lighting, IntiSolar and Neo-Africa.

2.1.2 Housing Department

The selection of housing areas for implementation is one of the most important components of the program. This process is managed by the housing department in communication with the Energy Office and service providers. The criteria for selecting a housing development include the following:

- 1) Low cost housing development within the EMA
- 2) Grid connected housing development
- 3) The house structure must be able to accommodate the installation of hot water heaters.
- 4) The roof has 9 trusses, which is more than double that of most of the older houses.
- 5) The roof pitch is sufficient.
- 6) All of the houses have a kitchen and bathroom/shower.

2.1.3 Local Project Officers

The eThekweni Municipality has contracted four Local Community Officers (LPOs) to act as the key community management agent in the eThekweni Low Cost Solar Water Heater Program. The LPOs are responsible for the following:

- 1) Communication with councillors
- 2) Communication with community members
- 3) Ensure that beneficiaries sign and accept the relevant program documents.
- 4) Facilitate education and awareness campaign on Solar Water Heating systems community outreach (joint responsibility with SWH service provider)
- 5) Work with SWH service providers to ensure that SWH targets are reached
- 6) Provide data on installation numbers to the Energy Office
- 7) Sign off on the quality of installations for each service provider.

Residents usually communicate issues and concerns with the program through their respective ward committee and representatives from the ward committee. These are then channelled to the LPOs.

2.1.4 Ward Committee

The ward Councillor and the ward committee work closely with the service provider to identify potential candidates to be employed through the program. They also assist with community communication about the project and household registration on the program. Most complaints and problems are channelled through the ward committees as a first step.

2.1.5 Water Inspectors

The eThekwini Water and Sanitation (EWS) Department have allocated four water inspectors to assist with the quality of installations that take place. The core function of the water inspector team is to ensure that the installations that take place comply with the eThekwini by-laws. The water inspectors conduct random inspections in each of the four areas in collaboration with the Energy Office.

3. Project Outline

3.1 Aim

The aim of this project is the continued management of Solar Water Heater (SWH) installations in low cost housing developments within the EMA.

3.2 Overall Scope

By the end of February 2012, it is expected that 20 000 SWH would have been installed on low cost houses throughout the EMA. However, it is also expected that a new national program for low pressure SWHs will be initiated in 2012 and that the eThekwini Municipality will receive an allocation of SWHs through this process.

The overall target of the municipality is to install 160 000 low pressure SWHs by the end of 2015.

3.3 Services Required

The eThekwini Municipality is intending to contract a service provider to act as the interim management agent for the eThekwini Low Cost Solar Water Heater Program for a 6 month period. The SWH management service provider will work closely with the eThekwini Energy Office and be responsible for the following:

1. Implement a **installation management system** to ensure new SWH installations adhere to installation checklist (Annexure 2)
2. Implement a **data management system** to ensure an accurate record of installations is in place.
3. Implement a **monitoring system** to quantify the electricity savings being achieved from the program.
4. Assessment and **quantification of SWH installation standardisation.**
5. Work with selected stakeholders (service providers, ESKOM, local project officers, EWS, Department of Housing) to ensure program is implemented effectively.

3.3.1 Installation management system

Currently there are a number of tools that have been developed to assist in managing the quality and volume of installations taking place. These include a standardised installation checklist (Annexure 2), a binding service level agreement, input from the local project officers and regular reporting sessions with the service providers.

However, the Energy Office does not have the capacity to ensure that these tools are implemented effectively and as a result the quality and volume of installations are sometimes problematic. The SWH management service provider will therefore take responsibility for implementing these tools and ensuring that the quality and volume of installations is better managed.

Please note that it is expected that this activity will require a very “hands-on” approach that will include site visits to the areas where installations are taking place.

3.3.2 Data management system

Historically there is very poor data collection for this program. This is partly because of a lack of standardization in the data recording process across different service providers, but also because the housing allocation areas often do not have accurate address information. In the current installation process, this has been partly addressed by requesting standardised information and GPS coordinates.

However, the continued collection and collation of this data will need to be managed to ensure that there is an accurate record of the installations taking place and that any issues and problems are recorded.

3.3.3 Monitoring system

Currently service providers have implemented a monitoring and verification (M&V) system that aligns with requirements for clean development mechanism (CDM) M&V plan. The implementation of the M&V plan varies across different service providers, but generally includes one house with metering data that is communicated wirelessly to a remote server.

The Energy Office currently has not accessed this data and the SWH management service provider will be expected to either develop a M&V system similar to those currently being implemented or work with the SWH service providers to access the data from the current M&V systems being implemented.

3.3.4 Quantification of SWH installation standardisation

SWH installations that took place during the period of January 2011-June 2011 were not consistent over different areas as the installation specifications for the low pressure SWH systems was not finalised. As a result, some of the earlier installations are not of the same standard as those that are currently being installed, which have a clearly defined installation specification list. The SWH management service provider will therefore assess the extent of the lack of standardisation, (most likely through a sampling survey) and develop an implementation plan on how best to ensure that this lack of standardisation is addressed.

4. Timeframe and Budget

The time frame for this management contract will be 6 months starting in mid January 2012 and terminating in mid June 2012 (depending on the finalisation of the procurement process). It is anticipated that the management team will consist of one senior project manager and one assistant/administrator, both at half time allocation for the duration of 6 months.

The appointment will be done through a competitive bidding process and will be adjudicated according to the 80:20 rule. The procurement will be done in terms of the Section 18 of approved Supply Chain Management Policy, "Procedures for procuring goods or services through written or verbal quotations and formal written price quotations¹".

6. Adjudication Criteria

The quotations will be assessed according to 2 step process. The first step is a functionality assessment and companies must score a minimum of 80 points (out of 100) in order to be assessed any further. Step 2 is adjudicated according to price and preferential procurements.

The scores for functionality are calculated as follows:

Step 1: Functionality	Score
1) Methodological Breakdown i. A detailed description of proposed actions for each of the required services	50
2) Energy Project Management Experience i. A detailed description of energy project management experience of proposed team member/s	50
TOTAL	100

Service providers are scored where applicable as Yes = Full points No = 0 points

Service providers must score a minimum of 80 points for functionality to be assessed further.

The scores for price and procurement are calculated as follows:

Step 2: Price and Preferential Procurement	Score
1) Price including 3500 units, project management, VAT and all other costs	80
2) Preferential Procurement (FPLITE Score)	20

5. Submission Requirements

Quotations should include the following information:

- 1) Proposed Methodology
 - a. A detailed description of proposed actions for each of the required services listed above
- 2) Management
 - a. A detailed description of energy project management experience of proposed team member/s.
- 3) Budget breakdown, inclusive of all fee, travel and VAT costs.
- 4) Time frame breakdown

¹ <http://www.durban.gov.za/durban/government/scm/strategy/Approved%20SCM%20Policy.pdf>

5) Supporting Documents

- a. Signed Declaration (see Annexure 1)
- b. Copy of Valid Tax Clearance Certificate.
- c. Copy of latest utility bill.
- d. Focussed Procurement Lite registration details (<http://fplite.durban.gov.za/>)

The eThekweni Energy Office does not bind itself to accept any quotation, and reserves the right to accept a portion of any quotation, unless the supplier expressly stipulates otherwise in their quotation. The eThekweni Energy Office does not undertake to consider quotations received after the due date and time unless clear evidence of dispatch is available (e.g. postage stamp with date). Quotations should be submitted preferably by email.

Please submit your quotation by 11:00am on Wednesday, the 11th January 2012 to:

Derek Morgan

E-mail: morgand@durban.gov.za

3rd Floor Florence Mkhize Building

251 Anton Lembede Street, Durban

Tel: 031 311 11 39

6. Annexure 1: Declaration

(Request For Quotations - Management of eThekwini Low Cost Solar Water Heater Program)

_____ (Name of Service Provider) hereby state:

- 1) Is the service provider is a natural person (Yes/No)
 - a. If the service provider is a natural person, has the service provider been is in the service of the state, or has been in the service of the state in the previous twelve months; (Yes/No)
 - b. If Yes, please provide details

- 2) If the service provider is not a natural person, are any of its directors, managers, principal shareholders or stakeholder is in the service of the state, or has been in the service of the state in the previous twelve months; (Yes/No)
 - a. If Yes, please provide details

- 3) If the service provider is not a natural person, has a spouse, child or parent of the provider or of a director, manager, shareholder or stakeholder referred to in subparagraph (2) is in the service of the state, or has been in the service of the state in the previous twelve months. (Yes/No)
 - a. If Yes, please provide details

Service Provider

Date:

Name:

Designation:

Signature:

Annexure 2: SWH Installation Checklist

Ref		Inst	Plum	LPO
1.THERMAL INSULATION				
1.1	Is external hot water pipe and fitting insulated?	✓	✓	✓
1.2	Is insulation attached (cable tied) with the minimum spacing of 0,5m?	✓	✓	✓
1.3	Is insulation installed to manufacturer's requirement, mitred + taped	✓	✓	✓
1.4	Is insulation resistance minimum R-1,00	✓	✓	✗
1.5	Is insulation UV and weather protected?	✓	✓	✗
2.ORIENTATION and INCLINATION				
2.1	Is collector tilt angle to latitude (+10 if required)?	✓	✓	✓
2.2	Is collector orientation facing Due North (Max deviation 90 East/West of North)	✓	✓	✓
3 HAIL+FREEZE RESISTANCE				
3.1	Is hail cover grid fitted as required on collector marking?	✓	✓	✓
3.2	Are pipes and fittings insulated against freezing in areas where frost/freezing occurs?	✓	✓	✓
3.3	Is collector marking freeze resistance if installed in areas where frost/freezing occurs?	✓	✓	✗
4. METAL PIPEWORK				
4.1	No galvanized steel pipes & fittings, have been fitted	✓	✓	✓
4.2	Have copper or stainless steel pipes only been used outside building?	✓	✓	✓
4.3	Are copper pipes connected to hot water tanks in compliance with SABS?	✓	✓	✗
4.4	Do the stainless steel pipes and fittings comply with SANS 965, ASTM A 312, BS 9704 OR ASTM 403?	✓	✓	✗
5. PLASTIC PIPEWORK				
5.1	Are plastic pipes and fittings only inside the building?	✓	✓	✓
5.2	Do compression fittings used on plastic pipe have internal inserts?	✓	✓	✓
5.3	Do polypropylene pipe systems comply with SANS 15874?	✓	✓	✗
5.4	Does cross-linked polyethylene pipe system comply with SANS 15875?	✓	✓	✗
5.5	Do polybutylene pipe systems comply with SANS 15876 ?	✓	✓	✗
5.6	Do PVC-C pipe systems comply with SANS 15877 ?	✓	✓	✗
5.7	Do PE-RT pipe systems comply with SANS 22391?	✓	✓	✗
5.8	Do PE-X pipe systems comply with SANS 21003?	✓	✓	✗
5.9	Are the fittings used as approved by SABS as a system?	✓	✓	✗
6 .PIPEWORK GENERAL				
6.1	Are all pipe fixed with manufacture's clips with the minimum spacing of 0,5m?	✓	✓	✓
6.2	Are only union/compression/pushon type fittings used at all connections to the tank, collectors and valves? Not soldered, glued, welded, crimped fittings?	✓	✓	✓
6.3	Are formed bends in Multi-layer PE-X pipes within the radius specified by the manufacturer?	✓	✓	✓
6.4	Are connections to tank and collector done as marked on the tank?	✓	✓	✓
7 .STAND AND MOUNTING				
7.1	Has the roof structure that will carry the anticipated loads, wind and rain been assessed by a competent person (structures) in accordance with SANS 1400?	✓	✓	✓
7.2	Does the section of the stand bearing most of the load of the storage tank rest on a load spreading beam?	✓	✓	✓
7.3	Are the stand footings secured or fastened in the waterways and not on the peaks of the roof cover material?	✓	✓	✓
7.4	Is the system level at 180 degree to the horizon, within a maximum deviation of 5 degrees?	✓	✓	✓
7.5	Have all roof penetrations (for bolts, screws, pipes etc) been sealed?	✓	✓	✓
7.6	Do the sealing methods and materials comply with SANS 10400 part 1, regarding clamping, coving and dressing around pipes?	✓	✓	✗
7.7	Are the stand footplates of acceptable size and design for the cover material to bear the load?	✓	✓	✗
7.8	Is the stand sturdy with adequate bracing to withstand loads?	✓	✓	✗
8. TAPS AND VALVES				
8.1	Is there an isolating valve on the geyser supply feed?	✓	✓	✓
8.2	Is the isolating valve accessible without a step ladder?	✓	✓	✓
8.3	Is a blending/mixing valve installed?	✓	✓	✓
8.3	Does the tap comply with SANS 226?	✓	✓	✗
8.4	Does the isolating valve comply with SANS 776 or SANS 1857 if a gate valve or to SANS 1056-3 if a ball valve or to SANS 226 if a stopcock?	✓	✓	✗
8.5	Does the isolating valve have a lever or handle of emergency shut down? (SAFETY)	✓	✓	✗

Ref	REQUIREMENT	Inst	Plum	LPO
9 .HOT WATER STORAGE TANK AND COLLECTOR				
9.1	Check that the hot water storage tank does not have provision (connection) of an electrical element – even if it is plugged off and is not fitted with an element. If the connection is there, the tank does not comply.	✓	✓	✓
9.2	Does the hot water storage tank comply with SANS 151?	✓	✓	✗
9.3	Does the system comply with SANS 1307?	✓	✓	✗
9.4	Do the markings on the storage tank and on the collector comply with SANS 151 and SANS 1307?	✓	✓	✗
9.5	Does the tank have a separate vent pipe that may have a return bend on top, or be fed into the top of the feed cistern above the overflow	✓	✓	✗
10. CISTERN FEED TAN				
10.1	Has a thermostatic tempering valve been fitted on the correct pipe work at the height, if the water in the hot water storage tank can heat to above 60 C?	✓	✓	✓
10.2	Is the cistern tank tight fitting and cover secured with screws?	✓	✓	✓
10.3	Does the cistern tank have additional acceptable fixed support e.g. collar or frame, which will carry the downward load and other applied loads like wind?	✓	✓	✓
10.4	Is the over flow level higher than the invert of the inlet valve?	✓	✓	✓
10.5	Are all pipe work connected to the cistern fixed to the roof structure or frame?	✓	✓	✓
10.6	Does the drain-cock on the storage tank comply with SANS 1808-35?	✓	✓	✗
10.7	Does the float valve comply with SANS 752?	✓	✓	✗
10.8	Is the float valve made of metal to deal with hot water?	✓	✓	✗
10.9	Does the supply pipe from the cistern feed to the bottom of storage tank through a " drop tube "?	✓	✓	✗
11	Is the cistern tank material suitable for high temperatures (>50 C)?	✓	✓	✗
11.1	Does the cistern tank capacity allow for the expansion volume (between the float shut off level and the overflow)	✓	✓	✗
11. INSTALLATION REQUIREMENTS				
11.1	Was the installation carried out by, or under the adequate supervision, of a Durban Ticketed plumber?	✓	✓	✓
11.2	Was the installation tap opened to see if water is running out, and the entire unit inspected and tested to check for compliance to the standards?	✓	✓	✓
11.3	Did the plumber hand over the safety, maintenance and operation manuals to the home owner?	✓	✓	✓
11.4	Did the plumber report any non-compliances on the installation to the home owner in writing?	✓	✓	✓
11.5	Were all the materials used on the installation checked against the SANS/JASWIC database for Local Authority acceptance?	✓	✓	✗
Lot/ERF No:		Area:		
Serial Number:		GPS Co-ordinates: E		
		GPS Co-ordinates: S		
Date Installed:		Date Plumber Inspected:		
Plumber Name:				
Plumber Company:				
Plumber Contract No:				
Plumber DBN No:				
Plumber Signature*:				
Local Project Officer Name:		LPO Signature:		
Instructions:				
Installer (Inst) tick all boxes and signs, then plumber (Plum) ticks all boxes and signs, then local project officer (LPO) ticks all boxes and signs				
Grey boxes are for equipment compliance and white boxes are for installation compliance				
*By signing this form, the plumber verifies that all materials used and work that was done complies with the mandatory standards, regulations, laws and bylaws that apply to these installation/s.				