The Solar Water Geyser Roll out

Polokwane Case study

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1. Introduction of Solar Water Geyser Programme

The White Paper on Energy Policy for South Africa (1998) provides for optimisation of Energy resources in a sustainable manner from which all citizens have access to meet their basic needs including electricity which while the country's economy is energy intensive, electricity could be generated from various sources, among others, fossil fuels, renewable energy, gas, nuclear, etc., (page7, close-out report for Polokwane local municipality, January 2022).

The South African government, through its Department of Mineral Resources and Energy (DMRE) resolved that the National Solar Water Heater Programme (NSWGP) contributes towards the achievement of the country's socio-economic, electricity demand and cushioning the poor on electricity bills, greenhouse gas (GHG) emissions reduction as well as industrialisation objectives. This emanated from non-target achievement from 2009 project let by Eskom as implementation agent. Eskom appointed ESCO companies which went all over the country and recruited clients, and upon installation, a claim was submitted for payment.

In 2014, the Department approached cabinet to note the revised NSWGP contracting model from which the programme was refocused to allocating the procured solar geyser units direct to the participating municipalities. In 2015, the Department published a tender for manufacturing, supply, delivery and storage of the solar geysers from which twelve (12) suppliers were appointed for a period of three years to manufacture and store the geysers at their premises. The Department had to pay monthly storage upon completion of the agreed number of manufactured geysers. A total of 87 206 baseline systems were procured.

Polokwane municipality is located in Limpopo Province of the Republic of South Africa, the only municipality from the province and the municipality who received the highest (10 000) solar water geysers in the country. The municipality received further 6000 units after a successful implementation of the first phase making a total of 16 000 solar water geysers. The request was made for 16 000 units initially and received 10 000, approved by council and low cost houses in the western site of the city and Seshego are benefiting from the programme. Wards 8, 11, 12, 13, 14, 17, 19 and 37 are those identified as primary beneficiaries, because of the high number of low cost housing being constructed there.

2. Request for proposal

On the 26 August 2016, the department of Mineral resources and energy circulated Framework Agreement to a number of municipalities who responded to the request for proposal issued in 2012. A major condition was that municipalities should obtain council approvals to participate into the Framework Agreement with DMRE. The following twenty municipalities were approved to participate and also allocated number of baseline solar water geyser units as follows with no order:

Municipality	Province	Quantity
JB Marks	North West	5000
Mafikeng	North West	5000
City of Matlosana	North West	5000
Bitou	Western Cape	3000
City of Cape Town	Western Cape	5000
Swartland	Western Cape	2000

Cape Agulhas	Western Cape	2000
Matzikama	Western Cape	2000
Mossel Bay	Western Cape	2000
Sol Plaatjie	Northern Cape	6000
Emthanjeni	Northern Cape	4000
Polokwane	Limpopo	10 000
Ethekwini	Kwazulu Natal	6000
Elundini	Kwazulu Natal	5000
Mpofana	Kwazulu Natal	5000
Makana	Eastern Cape	6000
Ndlambe	Eastern Cape	4000
Nelson Mandela Bay	Eastern Cape	200
The City of Tshwane	Gauteng	5000
Ekurhuleni	Gauteng	5000

3. Approval conditions

Municipalities were expected to assist in identifying households that will benefit from the project. The households should have strong roof structures to sustain the weight, have 24/7 good quality water in the house and house owners be characterised as low income owners. The households should be on newly proclaimed residential areas and should not be selected as per racial, political, or ethical grouping. The installer assistances should be selected by the municipalities and be those not working and should have contributed to UIF in the past. This is because training is sponsored from UIF contributions and Department of labor will help verifying previous contribution by installer assistants. The municipalities were also expected to provide the storage facilities during the installation processes.

The responsibility of DMRE was to procure Technical Feasibility Assessors in respect of identified residential areas, appoint project manager, installer companies and quality assurance personnel for the installations. The Department has the right to suspend or terminate, defer or reduce the supply and installation of baseline systems as per service level agreement entered into by both parties. The department further appointed Central Energy Fund (CEF), as project manager and to replace and/or repair components found to be missing in terms of installation processes.

4. Storage and Deliveries

Each beneficial municipality was expected to provide storage facilities for the total number of geysers allocated to them. Polokwane municipality provided storage for all 10 000 delivered solar water geysers. The storage should be fully secured with cameras and intruder alarms installed, backed by warm body security personnel. Both the municipality and Department had to provide staff responsible for verifying and recording all solar water geyser units received as per their serial numbers. A collection form had to be created to record the information and co-ordinates of where the units will be installed, the house owner and his/her details and the person collecting the geyser as well as company he represents, date and time collected.

Polokwane municipality received two types of Geysers, the tubular ones (1500) manufactured by company A, and flat ones (8500) manufactured by company B. Type A ones had no water mixers and were supplied with plastic valves. The Department is currently busy with a court case as company A did not manufacture as per specification. The valves could not sustain the hot water pressure and did bursts resulting in five incidents of people burned from the hot water. Those affected were

treated for minor injuries in different medical centres. The roll-out of this type were stopped which let to 689 geysers installed but not working. The roll-out also had one incident of damage to geyser after residents claimed favouritism during installations.

Picture for the Flat and tubular geysers in Polokwane

Picture of Plastic taps that overheated and went loose

Geyser damaged after claiming favouritism

5. Appointments

The department appointed a company who did technical feasibility study and found most areas qualifying except few areas where the water was at the corner stand and not in the house, and where a house had asbestos roof. The recommendation was that water connection be moved to the house at owner's cost or municipal costs. Some owners extended the water pipes from the corner stand to the house and those who could not were excluded during this first phase of installations. Steel reinforcement was recommended before installing geysers to the roofs and that type of houses were also excluded from the first phase of the installations. The exclusion from first installations was due to the fact that there were no budget allocations and the budget had to be referred to the following financial year to resolve asbestos roofs and extension of water pipes.

Three installation companies were appointed and each was allocated a ward or two to install as eight wards were affected and shared the installations. The installation companies brought along skilled personnel and sourced labor locally as well as the installer assistants.

Two training service providers were appointed to train a total of 160 learners out of 304 of total installer assistants allocation for Polokwane during phase 1. The theoretical training went well and the learners had to participate in the actual installations during the roll out to qualify for a certificate. The product specific training by manufactures for installer companies, municipal staff, DMRE staff, CEF and quality assurance staff were done before installations to guarantee the installations and safe guard the five-year warrantee.

Two community liaison officers (CLOs) were appointed by CEF to help with the smooth running of the project. They were appointed from the affected wards. The two were appointed from eight people recommended from each affected ward, interviewed and best two candidates were appointed.

6. Public participations

The public engagements started meeting with the all eight affected ward councillors, the member of mayoral committee (MMC) responsible for Energy services and three members of Energy portfolio. A joint operating committee was formed chaired by the MMC had members from installer companies, DMRE, CEF, CLOs (2) and municipal staff members. Monthly meetings took place to deal with project matters. Different meetings were held in each ward to introduce the project and also inform communities about the required documents of house owners to be collected and the signing of happy letters upon completion of each installation.

7. Implementation process

DMRE appointed three service providers to install 3684 baseline solar water geysers within Polokwane municipal areas as per council resolution. The implementation started slowly but gained momentum as time goes on.

Each appointed installer company was allocated a ward and indigence of the beneficiaries had to be considered as part of the approval by the municipal council. All councillors required the project to start at his/her ward.

The municipality managed to secure additional 6000 units based on how they implemented phase one on the project and the ability to secure storage facility at no cost.

8. Lesson learned

- Thorough public participation is required before implementing any project to the community
- Exemplary installation at manufacture's premises should have been installed to test complying with specifications.
- Installation of un-used geysers could have been avoided by comparing the product with the specification, as well as accessories required.
- Municipalities will incur major storage costs if this project is not implemented within minimum time limit.
- Department transferred their storage costs to municipalities
- Risk of theft at storage places
- Loss of geysers where there is minimum record keeping will be experienced
- Storage place should be far from areas to be implemented
- Full roll-out from one ward to another will safe installation costs
- The project is performance based and more geysers could be received if implementations are not disturbed.
- The municipality managed to secure additional 6000 units based on how they implemented phase one on the project and the ability to secure storage facility at no cost.

9. Challenges

- All citizens deserve to have the solar water geyser for cheaper lifestyle. The allocation is way less than the demand from communities.
- The water gets hot just after seven in the morning where the working class misses the advantage of hot water bath during winter.
- The supplied baseline systems that did not have some of the pipes. The manufacture claimed that this was not part of the scope of work including water mixes that helps prevent overheating of the units.
- Some households had asbestos roof structure, which were excluded during phase 1 of installation, thus causing tension to the community.
- Delay of procuring the required material which were not supplied as contracted with DMRE
- Lack of water during the day in some of the areas due to maintenance
- In some instances, councillors provided list of houses with geysers already. This was discouraged and only houses without geysers were considered.
- Contractual disputes as a result of delays in payment of contractors, that is time taken to verify the installations before payment and proof of stipend paid to learners.
- Lack of water tap in/at the houses in some areas. Some individuals negotiated and supplied water point where the installer company had to go back and install geyser.
- The practical requirement to provide certificates by training service provider. Theory in class plus three weeks on site physical installation experience.
- Leaner assistances working from one ward to another. The community raised the concern and tried to enforce that installer assistances work in their own wards only. This was addressed and assistances required certain time from physical work.
- The legal engagement between DMRE and manufacture who manufactured geysers not as per specification.
- 5080 extra geysers delivered out of 6000, where a 1000 had to be collected from another province to Limpopo.

10. Conclusion

The provisioning of solar water geysers improves the life of indigent customers and reduces the load and capacity which could be required when grid geysers get connected**.**

Despite all the challenges, the project went well and a recommendation to supply additional 6000 solar water geysers was approved.

Dedicated project managers are required for this massive rollout project if all outstanding 12 316 had to be all installed at the same time.