

# SAGEN: Energy Efficiency

## Household solar water heating: Experience and lessons learned from a pilot installation project in Nelson Mandela Bay Municipality

GIZ SAGEN supports a pilot project to test the implementation concept of the National Solar Water Heating Programme (NSWHP) and recommend best practice to the Department of Energy.

### The challenge

Solar water heaters have been available in the South African market since the late 1970s but due to a number of factors, the technology did not achieve a high level of market penetration. Recognising the potential positive impacts of solar water heaters, such as reducing electricity peak demand, mitigating greenhouse gas emissions, creating employment and alleviating poverty, the South African Government embarked on a public programme to install solar water heaters across the country. The programme took a number of formats but essentially instituted a subsidy programme to increase penetration levels. Reviews of the earlier phases of the programme indicated a number of problems such as low-quality installations due to unskilled labour, challenges associated with imported technologies not adapted to South African conditions and not realising local economic development and job creation potential. In 2014, the Department of Energy announced its intention to review the implementation concept for the National Solar Water Heater Programme (NSWHP). SAGEN was requested to provide support for the implementation of the NSWHP.

**SAGEN** / SOUTH AFRICAN-GERMAN  
ENERGY PROGRAMME



### At a glance...

Objective	Increase the sustainability of the national solar water heating implementation programme.
Implementation partners	Nelson Mandela Bay Municipality, Provincial Department of Labour.
Cooperation partners	Department of Energy, Provincial Department of Economic Development, Environmental Affairs and Tourism.
Potential impact	Quality installations through skills development and training; Job creation; Reduction in household energy consumption, resulting in energy and monetary savings; Improvement of quality of life and comfort through access to hot water; Reduction of greenhouse gas emissions; Improved infrastructure and municipal service delivery.





The challenge is to devise an improved implementation strategy that will result in quality installations, contribute to job creation, effect electricity savings and ultimately ensure a sustainable public programme for solar water heaters in South Africa. SAGEN chose to support a pilot project that could test certain approaches of the proposed implementation strategy.

## Our approach

### Collaboration for increased success ...

The NSWHP is an ambitious programme requiring the co-operation of a myriad of stakeholders. One of the objectives of the SAGEN pilot project was to implement a mini version of the NSWHP, involving all the planned stakeholders providing required inputs according to their respective mandates, exactly as if a larger programme were being implemented. A key objective was to test the possibility of using the Department of Labour to identify and recruit trainees from its records of unemployed job seekers. To ease stakeholder cooperation, SAGEN divided stakeholders into operational and strategic partners and formed a Programme Advisory Group (for strategic partners) and a Project Steering Committee (for operational partners). This meant that stakeholders were participating according to their level of interest and engagement in the programme, which allowed for optimum collaboration.

### SWH installer training ...

The pilot project set out to test if quality solar water heater installer training could be successfully delivered to registered unemployed beneficiaries of the Department of Labour. It also proved that trainees can be integrated into the programme by designing Terms of Reference for installation companies that compel them to employ new trainees. Working with the Department of Labour, 20 trainees were identified from the two project areas in Walmer and Rosedale. SAGEN appointed the Industries Education and Training Institute (IETI) in Port Elizabeth to

provide accredited training focused on health and safety, interpretation of technical drawings, basic plumbing skills as well as mounting and installing a solar water heater. Learners had to undergo four weeks of theoretical training and complete four weeks of practical work experience to receive their certification. Requiring the contracted installation company to appoint the learners closed the loop and enabled learners to obtain required job experience, without which they could not receive their qualification. The training was further augmented by product-specific training provided by the solar water heater technology supplier. At the graduation ceremony, learners received their certification as well as a toolkit which would enable them to provide independent solar water heater installation and maintenance services.

### Household engagement ...

The importance of community liaison and communication has been emphasised in a number of critical reviews of previous SWH implementation programmes. Community facilitation was handled by a SAGEN-appointed service provider, supported by the municipality at the onset of the pilot project. This ensured that accurate information about the planning and implementation of the pilot project was conveyed. While the installation areas selected by the municipality took factors such as house structures, water quality and electricity connections into account, the selection of actual beneficiary households was left to



community structures and ward councillors, supported by the municipality's own community liaison officer. SAGEN in cooperation with the Independent Power Producer's Office (IPP Office) designed a household user guide in four languages to provide basic maintenance and care instructions to homeowners receiving a solar water heater. The booklet aims to provide enough information for homeowners to care for their systems and to avoid costly maintenance.

### Impact assessment ...

To confirm the impact of the installed solar water heaters in Walmer and Rosedale, SAGEN commissioned a study that will collect and analyse data in order to verify the potential impacts. Data will be collected over an 18-month period to account for seasonal differences and to track household dynamics. The results from the impact assessment will be important for the DoE to justify investing in the national SWH programme. SAGEN also appointed a service provider to support households with any technical queries and to provide essential maintenance and technical support services. The service provider will collect data on the type and frequency of call-outs, which in turn will provide information to the DoE about required maintenance and back-up services.

### Results in figures ...

In total, 200 solar water heaters were installed (21 in Rosedale and 179 in Walmer). Beneficiary households received training

based on the household user manual, outlining basic care and maintenance procedures. A structured impact assessment is being planned for 2019, but anecdotal evidence suggests that households are satisfied with their solar water heaters and enjoying the benefit of hot water in their homes.

Twenty learners were selected to participate in the accredited training for installer aides and received their certification. Two learners found employment immediately after the course while two more learners formed their own company to provide plumbing services to the area.

### ... and in stories

SAGEN focused on the development of competencies at an individual level through training and skills development as well as ensuring that newly trained installers are given an opportunity to complete their practical job experience requirement. One installer trainee wrote: "The course will equip me to work with installation companies or start my own small business to fix solar water heaters here in Walmer". The training course is accredited by the Construction Sector Education and Training Authority (CSETA), and learners received certificates to confirm their qualification.

Capacity development on the organisational level focused on increasing the capacity at municipal level to plan and implement a solar water installation programme, as well as at the level of the Department of Energy to plan and implement the national programme roll-out.





The increased capacity at the national and local level will enhance the sustainability of the national programme. The activity strengthened cooperation in the sector, especially with the participation of the Department of Labour in the pilot project. The positive role and contribution of the Department of Labour was demonstrated and can now be strengthened in the planning process for the roll-out of the national programme.

### What next ...

SAGEN will continue to provide strategic support to the Department of Energy in the planning of the NSWHP. The lessons learned and products generated from the pilot project have been presented to the DoE for consideration in their planning. The results of the household impact assessment and technical support provision will be shared.

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