

Solar Water Heaters (SWH's)

Financial Feasibility for Low Income Households



In the past, it has been difficult to argue for the installation of SWHs in low income households. This is because these houses typically do not have electric geysers installed. Recent approaches to low pressure SWH system implementation in low income households, notably at Kuyasa in Khayelitsha, are beginning to make a financial case for SWHs in this sector. Low unit prices are key to this financial case. This is becoming a reality through:

- Bulk purchase discounts: Installed costs of R4500 are possible for low pressure systems
- The Eskom subsidy being made available to low pressure systems: This is a relatively new development, and further price reductions of R500-R1000 can be expected.
- Future carbon funding imminent: The argument of 'suppressed demand' (measure of potential future energy use of household) is one which has been made to and accepted by the CDM board, and agrees fundamentally with the concept of sustainable cleaner development. The large scale methodology of claiming carbon credits for low income SWH installations is in the final phase of being completed, which will then open the door for the registration of mass low income SWH projects with the CDM. At this point it is anticipated that the methodology will be accepted in mid 2009

High Pressure vs. Low Pressure

Solar water heaters can be designed to function as a high water pressure systems or low water pressure systems. High pressure systems are generally more expensive than low pressure systems. This is because the materials used for high pressure systems must be of high quality and strength in order to withstand the pressures created by the system.

Low pressure systems need to be durable, but do not need to withstand any pressure other than that generated by the weight of water they contain, keeping material costs down. Low pressure systems also do not require any additional valves to regulate the internal pressure of the system, further reducing costs. Low pressure systems are 'gravity fed' - therefore the higher the SWH, the stronger the water pressure at the water point. Mixing water, for example in a shower, is difficult with low pressure systems, as the cold water supplied by the municipality is at a substantially higher pressure. In South Africa, high pressure systems are usually targeted for the mid-high income sector, while low pressure systems are targeted for the low income sector.

All of these factors need to be taken into account when making a financial model for low income households.

Through a creative financing model which uses CDM funding, the Eskom incentive and development bank loans, a sustainable system of SWH delivery can be established in low income households.

The main premises of the financial model for low income SWH rollout are based on research conducted by the Kuyasa low income housing project. This project has secured carbon funding to assist in the installation of SWHs, insulated ceilings and efficient lights in 2000 low income households in Kuyasa, Khayelitsha. The following premises are used:

- people in the community are prepared to pay R20-R30 per month for hot water (following a survey conducted in the Kuyasa community)
- carbon certificates generated by the project can fetch €10/T on the carbon market
- through the CDM methodology used, the SWHs generate 1.8T of carbon credits per year.



Based on the above, a strong financial model based on low monthly repayments (R30 or less) can be developed, and make a compelling case for low income solar water heaters. Broadly the model will work in the following way:

1. The SWH implementing agent (company/local municipality) registers their project with the CDM using the large scale SWH methodology
2. The implementing agent secures a development bank loan to cover supply, installation and maintenance costs of the SWH
3. The implementing agent ensures that the SWH used is SABS approved and qualifies for the Eskom incentive
4. The community is approached to determine who would like to sign up with the programme. This would require that they agree to pay around R20 per month for their solar water heater (including maintenance)
5. The electricity distributor in the area recoups the R20 through the prepaid metering system – a critical element in the scheme. This can either be through a deduction from the first electricity payment of the month, or a reduced number of FBE kWh’s available (though this may be trickier institutionally, given that profit is gained through determining a suitable repayment period.

Indicative quantitative financial analysis	
Cost of 110l SWH *installed including Eskom incentive	R 3,500
Annual payment *Development bank @ 8% pa, 10 yrs	R 521.60
Tonnes of CO2/unit/year	1.8
CDM Income pa (€10/T)	R 234.00
End user payment/year	R 287.60
End user payment/month	R 23.97

Key Criteria required to get this model working
1. Buy in from distributor (City/Eskom) that collection for SWHs occurs through prepaid meter system
2. Access to attractive financing
3. CDM financing available
4. Eskom incentive available

Cities can choose to be the implementing agent, or assist a private implementing agent by collecting via the prepaid meter system on their behalf.

