ENERGY EFFICIENT HOUSING & CLIMATE CHANGE

Demonstration of Interventions for Low Income Housing in KwaZulu Natal

Background

Challenge on a national scale:

- 10 million households in South Africa (2002), 57% “low-income”
- Most low-income households based in rural areas
- 83% of urban households & 50% of rural households are grid connected

Low income households (electrified or not) have multiple fuel use:

- electricity (if connected) for lighting, media and refrigeration (if owned)
- alternative fuel, often paraffin, for heavier energy service needs

Issues to address:

- Electricity is expensive for cooking, space heating and water heating
- High costs of replacing electrical appliances
- Paraffin is much more flexible –borrowed, bought or credit from local spaza
- Paraffin appliances more portable, can use as heaters and stoves
- Paraffin and candles cause bad fires & poor indoor air quality
- Gas is little used - poor access, high initial cost and perceived less safe
- Renewable energy (solar, wind, hydro, biofuel) rare in low-income households

Energy Needs

The principal low-income household energy needs:

- Cooking
- Space heating
- Hot water
- Lighting
- Refrigeration & space cooling
- Communications & entertainment
- Household appliances*
- Energy for micro-enterprise

Project Locations

- Weldebadcht – peri urban area in eThekweni
- Endaleni – peri urban area near to Richmond
- Nr Dududu – rural area in Vulamehlo

Technologies Offered

- Solar water heaters
- Wind generators (individual domestic use)
- Solar home systems
- Gelfuel stoves
- Solar cookers
- LP Gas cookers
- Hotbags for all cooking
- CFLs for all households

Scope of Work

1 Feedback and Awareness

Feedback sessions / workshops in all three areas to sensitise stakeholders (ie: Municipality, community, project teams) as to the main findings, issues and recommendations arising from the initial assessment phase and related report.

2 Liaison with Provincial and National Organisations

Key stakeholders, including government departments and parastatals, have been engaged in order to sensitise them to the project, assess the potential for replication, determine their willingness to assist, and to determine their role / potential role going forward

3. Packaging and Financial Modelling

The most appropriate package for demonstration at each of the three selected areas (ie: Vulamehlo, Richmond and Welbedacht) was determined along with the nature and scale of the delivery package. A financial model, including the methodology for customer payments, was developed on the basis that local entrepreneurs will drive this process and ensure sustainability.

4. Monitoring and Evaluation

A monitoring and evaluation framework was set up to assess project performance. This included: a) objectives; b) list of activities; c) performance indicators; d) baseline; e) means of verification timetable and date for completion.

5 Implementation of Demonstration Projects / Sites

Relevant low-income households were matched to appropriate suppliers and offered the selected energy technologies at a subsidised price using a micro-financing plan.

Installation has been completed for identified customers. Key issues include:

- selection of appropriate technologies and suppliers
- identifying the nature (extent) of the local market
- increasing affordability through external financing
- ensuring positive contacts established at all levels
- finding or creating a local outlet for distribution and cash-collection
- offering a simple and accessible micro-financing scheme
- building local capacity for installation, maintenance and business management to ensure that the activity is sustainable, based on market dynamics, after completion of the project
- establishing a cash collection system with the support of local implementers

Area	Total Number of households benefiting	Solar Water Heaters	Gel Fuel Stoves	PV Solar power (1)	PV Solar power (2)	Solar Cooker s	Wind Generators	Hotbags	Compact Florescent Lights
Welbedacht	52	23	25	0	1	3	0	25	200
Dududu	90	0	58	1	26	3	1	68	
Total	142	23	83	1	27	6	1	93	200

Note: The cumulative value of all of the pilot packages provided is R410,858.

Table 1: Quantity of Products Supplied to the Two Pilot Project Areas

Product	Description	Unit cost (SAR) (excl. vat, installation & handling fees)	Unit cost (SAR) (excl. vat, incl. installation & handling fees)
Solar Water Heaters	100 litre insulated solar water tank with electrical backup plumbed into existing water pipes (eg: shower / sink) - uses direct heating solar panels rather than solar electricity.	3,275	4,475
Gel Fuel Stoves	Gel fuel stove (double burner) with 24 month gel fuel supply (10l per month)	1,626	1,626
PV Solar power (2)	65w system providing sufficient power for three CFL lights, radio, small black and white TV, cell phone charger	3,578	4,266
Solar Cookers	Direct heat solar cooker (dish reflection)	not applicable	1,400
Wind Generators	150w system providing sufficient power for several CFL lights, radio, colour TV, cell phone charger - includes videos color tv	5,256	7,056
Hotbags	Insulation bag (reflective material lined with fabric to accommodate small to large pot)	85	90
Compact Florescent Lights	Low wattage CFL's which use approx. 18% of a standard incandescent light (11w = 60w) and which last significantly longer - supplied in sets of 5	75	75

Table 2: Profile of Products Supplied to the Two Pilot Project Areas