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Project Name:

Kuyasa Low-cost urban energy upgrade project.

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Revision date: 18 June, 2014

Project Location:

Kuyasa Township

Khayelitsha

South Africa.

GPS coordinates: -34° 3' 27.15", +18° 41' 41.07"

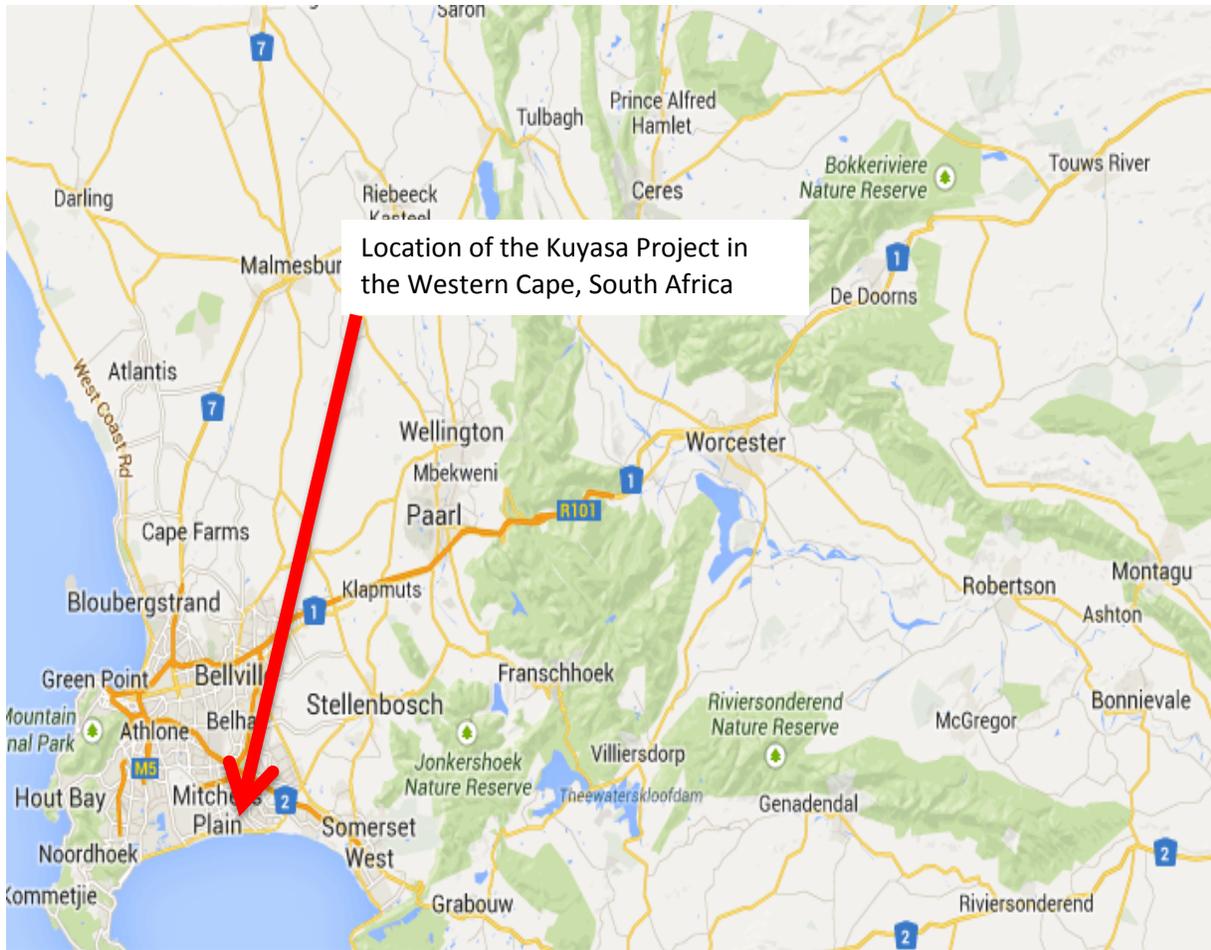


Figure 1: Location of the Kuyasa Project in Cape Town, South Africa

Project description

Kuyasa is an existing, low-income housing development in Khayelitsha, Western Cape. In 2014, the project involves 2 100 houses for which 110 litre solarwater heaters, ceiling and compact fluorescent energy efficient lightbulbs (CFLs) have been installed. The intention is to reduce household expenditure on coal-fired electricity and supplementary paraffin and to reduce the greenhouse gases associated with thermo-regulation of homes and with water heating and to generate improved thermal performance, lighting and water heating efficiency.

Co-benefits of the project activity include a reduction in local air pollution with subsequent decreases in pulmonary pneumonia, carbon monoxide poisoning and other respiratory illnesses. A decrease in accidents and damage to property as a result of fire is also anticipated.

The specific technologies applied include:

- **Insulated ceilings:** The ceilings are comprised of IsoBoard with a thickness of 25mm and thermal insulation of 0.024 Kw/°C.
- **Low pressure, evacuated tube SWH's:** Initially the SWH installed were Genergy SWH and these were later replaced by XStream (a locally manufactured SWH) when they became available.
- **Lightbulbs:** 14W compact fluorescent light bulbs



Figure 2: Images from the Kuyasa project

Livelihood impacts:

Awareness raising and some training is provided as part of this project. The installation of the technologies was undertaken by a number of (unemployed) unskilled or semi-skilled individuals resident in the target area. These individuals were sourced through a tendering process facilitated by the existing Ward Development Forum (WDF) in Khayelitsha.

To date the project created 85 full time jobs of which 50 were youth, 28 were women and 3 were disabled and paid a total of 65 425 job days. A total of 2 350 work opportunities were created during the implementation phase and 5 were created during the maintenance phase. The installed technologies save the beneficiary households an estimated R1 000 per annum in energy costs, while delivering a more liveable, safer and healthier dwelling.

Project Period:

10 years commencing 2010

GHG Savings schedule:

Kuyasa was registered as a Gold Standard, CDM project in 2005. Implementation started in May, 2008, however, as at 28 February, 2014, no CDM CERs have been issued (Department of Energy SA, 2014) principally due to the transaction costs involved in issuance.

As a registered CDM project Kuyasa continued to conduct monitoring and evaluation reports and to submit these reports to the CDM Executive Board until 2010. Monitoring complied with CDM Gold Standard procedures as above and involved randomly sampling 30 houses from the roughly 2 100 houses that have benefited to date. Details of this can be found in the final Project Design Document (PDD) (Agama, 2005:Section D).

- Between 1 September 2005 – 28 February 2009, the project had very few households with installed energy efficient and solar technologies and saved **412 tonnes CO₂** as recorded by the CDM Executive Board (F-CDM-MR, 2009).
- Between 1 March 2009 – 15 November 2010, installations proceeded and the CDM Executive Board recorded emissions savings of **9 135 tonnes CO₂** (F-CDM-MR, 2010).
- Since 15 November 2010, 2 100 households have enjoyed the benefits of clean-tech installations and an estimated 5 895¹ tonnes CO₂ savings have been generated per annum. These credits have not been verified by the CDM Executive Board due to the cost of this process for the project. A verification process for the period up to November 2010 was initiated and the Project Developer is currently awaiting confirmation of this process.

The anticipated greenhouse gas savings are comprised as follows:

Table 1 Anticipated greenhouse gas reductions (CO₂e) from the project

| <i>Source</i> | <i>CO₂ emissions</i> |
|--|---|
| For all 3 Project Activities | 5.5966 CO₂ tonnes/hh/year |
| Baseline | 8.442 CO₂ tonnes/hh/year |
| Total annual CO₂ tonnes emissions avoided per household = 2.85 | |
| Water heating | 1.288 CO₂ tonnes/hh/year |
| Lighting | 0.228 CO₂ tonnes/hh/year |
| Space heating | 1.33 CO₂ tonnes/hh/year |

Source: (Agama, 2005:Table 5)

¹Based on 2 100 households at 2.85 tCO₂e/household/year (Agama, 2005; F-CDM-MR, 2010).

Further details on the calculations used in calculating the GHG reductions are given in a CER Calculations spreadsheet for the period up to February 2009 (Agama, 2009).

Project Partners:

The PACE Centre is a South African not-for-profit (NPO registration number 055-238-NPO), voluntary organisation whose registered office is at The PACE Centre NPO, Office Annex, 2 Bokkemanskloof, Hout Bay, 7806, this is also the registered postal address (www.carbon.org.za). PACE plays the role of Project Proponent in the Kuyasa project.

SouthSouthNorth (SSN) Operates as the project developer to the Kuyasa Project. SSN is a not-for-profit Company, mandated by the City of Cape Town to oversee the collection of carbon revenues and the maintenance of the project. Their physical address is:

No.2 Roodehek Street, First Floor Roodehek House, Gardens, Cape Town, 8001.

The project operator has signed a “Credit Supply Agreement” whereby it will seek to supply credits generated since 1 December 2010 exclusively to the Credible Carbon registry for a period of one year commencing on 1 July 2014. The lodging of the credits in the Credible Carbon registry is subject to them complying with the Credible Carbon registry standards, as confirmed in an independent audit.

Methodologies involved:

The project involves 2 100 low cost houses in the Kuyasa section of Khayelitsha township, in which three technological interventions have been applied to reduce energy consumption from the grid and from paraffin.

- **AMS-I.C. ver. 5** – Thermal energy for the user. Solar water heaters: 18 tube evacuated tube collectors, 1.95 square meters.
- **AMS-II.C. ver. 5** – Demand-side energy efficiency programmes for specific technologies. Energy efficient lighting: 14 W CFLs, replacing 60 W incandescent lights.
- **AMS-II.E. ver. 5** – Energy efficiency and fuel switching measures for buildings. Ceiling insulation: 25mm ISO Board.

Monitoring and evaluation for Credible Carbon:

The Credible Carbon registry requires an independent audit of all projects in order to answer four definitive questions:

- i. **Is the project real?**
- ii. **Is the described technology in place and functioning in accordance with its design specification?**

- iii. Are the estimates of greenhouse gas emissions reduction reasonable in terms of accepted international standards and unbiased towards buyer or seller?
- iv. Is there a discernible impact on poverty?

The auditors appointed by Credible Carbon are expected to conduct a site visit and representative sample of their own, but will be able to draw on the project PDD and submitted to the CDM Executive Board as well as independent research conducted on the project's mitigation and developmental impact.



Figure 3: Kuyasa housing with solarwater heaters

References:

Agama. (2005). *Kuyasa final PDD 2005*.

Agama. (2009). *CER Calculations - Up to Feb 2009 140606*.

Department of Energy SA. (2014). *South African CDM Projects Portfolio 2014* (pp. 1–76). Retrieved from <http://www.energy.gov.za/files/esources/kyoto/2014/South-African-CDM-Projects-Portfolio-up-to-28February2014.pdf>

F-CDM-MR. (2009). *Monitoring Report Kuyasa 140609*.

F-CDM-MR. (2010). *Kuyasa Monitoring Report 01/03/2009 – 15/11/2010*.