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CASE STUDY

Sub-Saharan Africa • South Africa

Kuyasa CDM Project: Renewable energy efficient technology for the poor

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Executive Summary

Although South Africa is viewed economically as a developing country, it is a significant carbon polluter and emitter of greenhouse gases, mainly due to its coal-fired electricity generation facilities and large industries. The country has also recently experienced energy shortages and still faces challenges in providing energy to its poorer citizens. In order to address the serious housing problems facing the newly democratically elected government in 1994, a large number of government-subsidised, but energy inefficient, houses were built over the past 15 years.

The Kyoto Protocol's Clean Development Mechanism (CDM) offered a way for South Africa to address the thermal inefficiencies of these houses, while rolling out energy efficient technologies as part of the CDM carbon credits facility. The idea developed and registered between 1999 and 2005 was to retrofit 2,309 low-income houses in the urban township of Kuyasa, Khayelitsha, with solar water geysers, insulated ceilings and compact fluorescent light (CFL) bulbs. Although 10 demonstration installations were completed in 2003, implementation and funding model problems saw the project stalled for over two years.

Carl Wesselink, and his brother Pieter, from the South African Export Development Fund (SAEDF), had developed a financing approach for large-scale, solar-water geyser installations and were keen to employ it to complete the Kuyasa CDM project. Their reworked business plan, which included lower solar water geyser costs, greater community participation, and an innovative funding model, was accepted in late 2007.

Wesselink's entrepreneurial drive and social conscience saw the installations get under way in early 2008. An important aspect of his model was the monthly financial contribution from each of the 2,309 households in Kuyasa, for which a simple and sustainable funds collection solution is still being sought. Wesselink has also been working with a new solar water geyser manufacturer in South Africa to overcome the risks associated with the almost-boiling point temperature and quality concerns of existing low-cost solar water geysers. The encouragement for, and support of, a local manufacturer for the required solar water geysers and tempering valves also achieves the import-offset objective of the SAEDF.

To date, the Kuyasa CDM project has created 87 jobs, completed 1,800 of the 2,309 installations, decreased the amount spent by the poor on energy, and is reducing approximately 2.85 tons of greenhouse gas emissions per low-income house per year. The project has also provided impetus towards the development of a larger-scale 'national sustainable settlements facility' that could see solar water heaters and thermal performance improvements financed and installed across millions of other low income houses in South Africa.



Introduction

The lives of South Africa's poor are often still constrained by the economic and social outcomes of the pre-1994 apartheid system. Although millions of the poor have received government-subsidised houses during the past 15 years, the quality and energy efficiency of these structures has been criticized, as the occupants suffer a disproportionate financial and health burden directly linked to poor thermal efficiency.

The Kuyasa Clean Development Mechanism (CDM) project was developed to retrofit 2,309 low-income houses in the urban township of Kuyasa, Khayelitsha, with solar water geysers, insulated ceilings and compact fluorescent light (CFL) bulbs. Although initiated in 1999 and registered in 2005, with 10 demonstration installations completed in 2003, the project stalled due to problems with the implementation business plan.

Entrepreneur Carl Wesselink believed that the project was important to complete and, with his brother and the South African Export Development Fund (SAEDF), developed a funding model and implementation plan that significantly changed the approach to the installations and has laid the groundwork for a larger-scale energy efficiency venture.

Market and Location Context

Since 1994, the African National Congress (ANC)-led democratic government in South Africa has promised a “*better life for all*”, including adequate housing, access to water, electricity, sanitation, education, health care, decent transportation, and economic opportunities. Although significant progress has been made in redressing the inequalities of the past, including the provision of piped water to over 12 million people in the post-apartheid era¹, significant backlogs still exist in terms of adequate housing and access to energy.

South Africa's GDP is the 32nd-largest in the world (at US\$277 billion)², although it holds the number 11 spot on the Top 20 greenhouse gas (GHG) emitters' list, contributing over 400 Mt/year³ or 1.8% of global emissions. This is about the same amount as the UK, which is six times more industrialized than South Africa.⁴ In terms of power generation, South Africa is served by the public enterprise Eskom. Its required reserve margin has “*plummeted to a perilous 7%*”⁵ against the international norm of at least 17-20% for coal-based electricity

¹ State of Local Government in South Africa: Overview Report. (2009) Cooperative Governance & Traditional Affairs

² World Bank (2009) World Development Indicators database. Gross domestic product (2008). Available at <http://siteresources.worldbank.org/DATASTATISTICS/Resources/GDP.pdf>

³ Schneider, M. (2009) The Road Ahead, Financial Mail, 17 October

⁴ Schneider, M. (2009) Tough Love. Financial Mail, 16 October

⁵ *ibid*



generators, resulting, in early 2008, in widespread rolling blackouts and a GDP reduction of 3.2 % in the first quarter of 2008.⁶



Map of Western Cape
Source: http://wikitravel.org/en/Western_Cape

Kuyasa is a low-income formal housing settlement in Khayelitsha, a large township settlement located approximately 30km south-east of the City of Cape Town. Phase one of this township settlement consists of 2,309 once-off, state-subsidized, 30m²-housing units. Although data is often disputed, the national census of 2001 suggested that approximately 400,000 people live in Khayelitsha, an area that covers 52.5km², with a population density of 7,748 inhabitants⁷ per km². It was originally planned to accommodate 250,000 residents.⁸ Most residents

claim origin in, or close family ties with, the Eastern Cape Province of South Africa, one of the poorest regions of the country that borders the Western Cape Province of which Cape Town is the capital. Before 1994, the apartheid government dictated that black people have a 'homeland' where they would own land and houses, and would only temporarily live in Cape Town to provide their labour to white business. In 1983, the government then moved all black people who had been living in and around Cape Town to a new township, called Khayelitsha, which means 'New Home' in isiXhosa, the dominant language in the Eastern Cape Province.

Residents in low-income, informal settlements use a range of materials and construction methods to construct, reinforce and expand their homes, including iron, tin, timber, plastic, cardboard and concrete slabs. In Khayelitsha, 32% of the population lives in informal shacks (about 128,000 people), with 71% of the township population living below the poverty line.⁹ The move from informal shacks to formal brick houses has almost exclusively occurred through the post-1994 ANC-led government's Reconstruction & Development Programme (RDP). During the past 15 years, 2.8 million such houses have been built by the government,

⁶ Wanneburg, G. (2008) Eskom news could hurt economy more. Cape Argus, 4 November, pg. 3. Available at: http://www.idl.co.za/index.php?set_id=1&click_id=3053&art_id=vn20081104120316298C888260.

⁷ Business Trust. (2007) Nodal Economic Profiling Project: Khayelitsha. Available from <http://www.btrust.org.za/index.php?id=185>

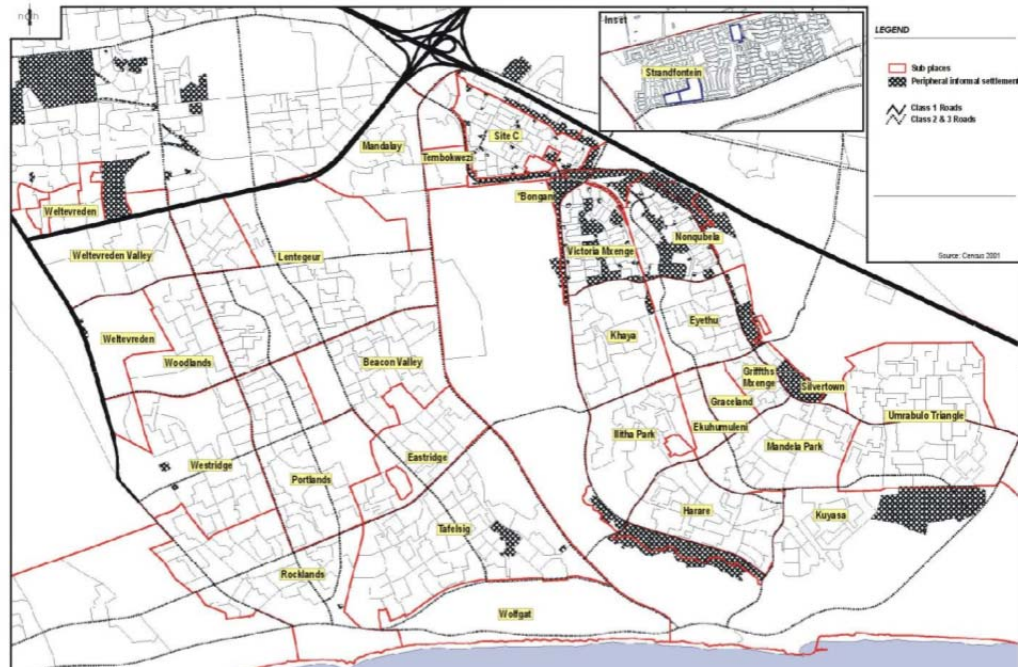
⁸ Department of Provincial and Local Government. (2006) Preliminary Impact Assessment for the Khayelitsha Mitchells Plain Urban Renewal Programme. Available from: http://www.capetown.gov.za/en/urbanrenewal/Documents/URP_-_Preliminary_Impact_Assessment_for_the_Khayelitsha_Mitchells_Plain_-_PDF_682007153323_.pdf.

⁹ Business Trust. (2007) Khayelitsha Nodal Economic Development Profile. Available from <http://www.btrust.org.za/index.php?id=185>



although they recognise that 1.1 million South African families still live in slums,¹⁰ mainly due to the significant backlog in government-sponsored RDP housing programmes.

Figure 1: Kuyasa in Khayelitsha (indicating formal and informal housing)



Source: City of Cape Town official website – local government services¹¹

The energy profile of the residents of Kuyasa has in the past been characterized by the use of multiple fuels (e.g. paraffin, wood, electricity) for space and water heating. Each 30m²-housing unit, provided by the government in Kuyasa was electrified with a single power supply point on a prepaid electricity meter, but had no internal wiring, no insulation, and no water heaters/geysers. Lighting was provided by incandescent bulbs on ‘do-it-yourself’ wiring.

Description of the Business Model

PROJECT INITIATION

As the world was nearing the new millennium, Steve Thorne, an environmental scientist, working in the area of energy efficiency at the developmental organisation, SouthSouthNorth (SSN), became interested, from a developmental perspective, in removing energy market

¹⁰ City official interview, 3 November 2009, Cape Town

¹¹ City of Cape Town official website – local government services¹¹
[http://www.capetown.gov.za/en/urbanrenewal/Documents/URP - Preliminary Impact Assessment for the Khayelitsha Mitchells Plain - PDF_682007153323_.pdf](http://www.capetown.gov.za/en/urbanrenewal/Documents/URP_-_Preliminary_Impact_Assessment_for_the_Khayelitsha_Mitchells_Plain_-_PDF_682007153323_.pdf)



barriers in Africa. It was around this time that “CDM came along,”¹² and Thorne began focusing on the Clean Development Mechanism (CDM) of the Kyoto Protocol, which is regulated by the United Nations Framework Convention on Climate Change (UNFCCC). He wondered whether he and his colleagues could “*do something that really deals with sustainable development*”, which included “*emissions reductions at a project level.*”

The CDM allows GHG emission-reduction projects in developing countries to earn certified emission reduction (CER) credits, each equivalent to one ton of CO² (carbon dioxide). CERs can be traded and sold, and used by industrialized countries to meet a part of their targets under the Protocol.¹³ Projects qualify through a rigorous, public process designed to ensure real, measurable and verifiable emission reductions that are additional to what would have occurred without the project.

Through Thorne’s conversations with colleagues at the NGO, Sustainable Energy Africa, he met Monwabisi Booi, a resident of Kuyasa and City of Cape Town official, who suggested that they could create a CDM project in Kuyasa. The community access to the clearly defined area of the recently developed Kuyasa RDP housing scheme made it an ideal site. From 1999 to 2002, Thorne and the SSN team developed the Kuyasa CDM project idea for the City of Cape Town and began presenting the concept to the community via town-hall meetings. The idea was to retrofit the 2,309 RDP houses in Kuyasa with solar water geysers, insulated ceilings and compact fluorescent light (CFL) bulbs. The aim of the project was to improve the thermal performance and energy efficiency of the existing low-cost housing units, thereby alleviating energy poverty by providing the poor with access to renewable energy efficient technologies. A related objective was also to address – in the words of Steve Thorne – the “*suppressed demand*” for energy services due to poverty and lack of infrastructure – both in terms of changing the “*demand patterns for energy*” as the poor “*meet these needs with less energy*”, and in terms of stimulating local manufacturing demand for solar water heaters.

One of the Kuyasa residents attending a community presentation on the CDM project in January 2002 was Mr. Zuko Ndamane, who had recently moved into the area and noticed how depressed and ‘down’ the community seemed. As the meeting called for community facilitators to steer the local implementation, Ndamane volunteered himself, seeing the project “*as an opportunity to change that [sentiment in the community], although [he] didn’t know at the time it would take that long to change.*”¹⁴ Although ten houses were piloted in 2003, in order to submit the project for UNFCCC registration, no further implementation took place until early 2008.

¹² Steve Thorne interview, 3 November 2009, Cape Town

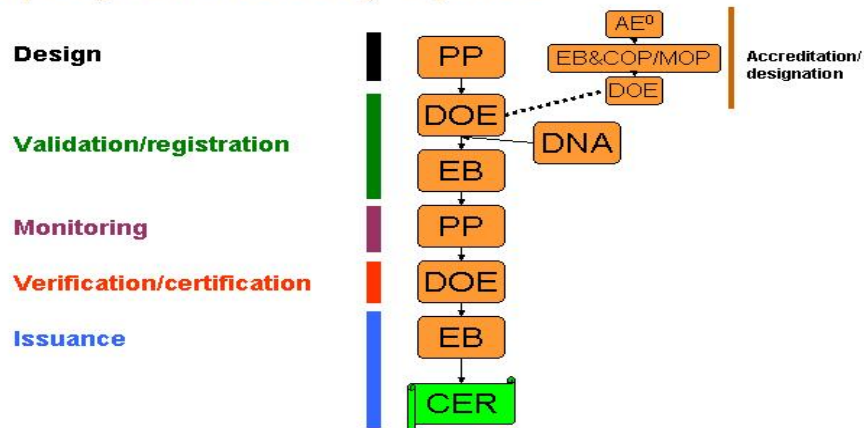
¹³ United Nations Framework Convention on Climate Change. (2008) Clean Development Mechanism: 2008 in Brief. Available from: http://unfccc.int/resource/docs/publications/08_cdm_in_brief.pdf.

¹⁴ Zuko Ndamane interview, 2 November 2009, Cape Town



Figure 2: Clean Development Mechanism (CDM)

CDM project activity cycle



Source: <http://cdm.unfccc.int/CommonImages/ProjectCycleSlide.jpg>

In terms of the guidelines of the UNFCCC, the design phase of the CDM project activity cycle is driven by the project participants (PP) who complete and submit extensive project design documents to the designated operational entity (DOE) and designated national authority (DNA) for independent evaluation and validation. In South Africa, the DNA is the Department of Minerals and Energy (DME). Professional services firm PricewaterhouseCoopers is the only accredited DOE in South Africa, although project participants are free to use foreign-based DOEs.¹⁵ In order to validate the proposed CDM activity, the project participants are responsible to provide written approval of the voluntary participation from the DNA, including confirmation that the project activity assists in addressing sustainable development.¹⁶

The original project documents for the Kuyasa CDM project were submitted by SSN to the chosen DOE, Norwegian firm Det Norske Veritas Certification Ltd (DNV) in November 2004 and were made available for public comment from December 2004 to January 2005. A revised set of project documents were then submitted in February 2005 and were followed by extensive interviews and site visits until June 2005.¹⁷ For the Kuyasa CDM project, the

¹⁵ Schneider, M. (2008) Ins and outs of CDM. Financial Mail, 17 October

¹⁶ United Nations Framework Convention on Climate Change. (2006) Report to the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol on its first sessions, held at Montreal from 28 November to 10 December 2005. Available at <http://cdm.unfccc.int/Reference/COPMOP/08a01.pdf#page=43>

¹⁷ Telnes, E. (2005) CDM Project Activity Registration and Validation Report Form: Kuyasa low-cost



approval letter from DME was requested in March 2005 and received in May 2005. According to the UNFCCC, after making the project documentation available for consultation publicly for 30 days, the DNA must confirm the acceptability of the project within 45 days of submission.¹⁸ The Kuyasa CDM project was validated in July 2005. The proposed CDM activity is then registered through a formal acceptance, within eight weeks of receipt of request for registration, by the Executive Board (EB) of the UN Framework Convention on Climate Change, which occurred for the Kuyasa CDM project in August 2005.

The monitoring phase of the UNFCCC CDM activity cycle includes the collection and archiving of all relevant data necessary for estimating or measuring the baseline and ongoing anthropogenic emissions by sources of GHGs related to the project during the crediting period. These reductions are then periodically independently reviewed by the DOE, who then issue a written assurance to certify that the CDM project achieves the reductions. This certification serves as the request to the Executive Board for the issuance of CERs equal to the amount of reductions.¹⁹

ORIGINAL BUSINESS PLAN

Between 2003 and 2006, Thorne was able to secure approximately R24 million (US\$3.2 million)²⁰ in public funding from the national Department of Environmental Affairs and Tourism (DEAT), by positioning the project as part of the National Government's Expanded Public Works Programme (EPWP) to create employment. The DEAT was responsible for directing EPWP funding, earmarked to reduce and alleviate unemployment, towards environmental projects and thus invited proposals from interested projects and organisations. The DEAT selected Agama Energies as the implementer for the project in August 2006, as SouthSouthNorth "*didn't want to do the implementation,*"²¹ because they were more set-up for policy, research and advocacy work, and DEAT then paid Agama R1m (US\$133,333) to produce a business plan, which, according to the City "*took a year or more to do,*"²² partly due to problems with the plan drafts. Unfortunately, the first plan draft was rejected as it did not take the 30% work creation requirement of the EPWP into account and was based on a "*conventional civil engineering*"²³ approach that could not deliver the 2,309 installations within the budget allocated. After much "*scrabbling and ducking and diving*" a revised plan was tabled that met the 30% requirement by reducing the number of homes to around 680, resulting in the "*ridiculous point where you are spending R24 million (US\$3.2 million) to do*

urban housing energy upgrade project. Available at http://cdm.unfccc.int/UserManagement/FileStorage/FS_868347409

¹⁸ United Nations Framework Convention on Climate Change. (2008) Clean Development Mechanism: 2008 in Brief. Available from: http://unfccc.int/resource/docs/publications/08_cdm_in_brief.pdf.

¹⁹ Zuko Ndamane interview, 2 November 2009, Cape Town

²⁰ 1US\$ = R7.50, as at 9 December 2009

²¹ Business Trust. (2007) Khayelitsha Nodal Economic Development Profile. Available from: <http://www.btrust.org.za/index.php?id=185>

²² City official interview, 3 November 2009, Cape Town

²³ Telnes, E. (2005) CDM Project Activity Registration and Validation Report Form: Kuyasa low-cost urban housing energy upgrade project. Available at http://cdm.unfccc.int/UserManagement/FileStorage/FS_868347409



600 odd homes and you are spending R40,000 (US\$5,333) per home [on retrofitting energy efficient technologies]. I mean these were homes that were built for R12, 000 (US\$1,600)... so ultimately that was not found viable.”²⁴ Although the City of Cape Town continued to win recognition for the project “left, right and centre,”²⁵ and was receiving international, academic and media attention as Africa’s first CDM project and the world’s only registered Gold Standard project,²⁶ there was not yet an implementer appointed for the project and “it didn’t exist.”²⁷

Meanwhile in Kuyasa, Ndamane, who was coming under increasing pressure from the community and local politicians for the lack of implementation progress, could only continue to promise that “it is coming, I just can’t tell you when but it is coming.” That was until he got a call in late 2007 from Carl and Pieter Wesselink from the South African Export Development Fund (SAEDF), a closed end fund in which any returns generated are reinvested in the fund.



Testing site for SWGs (Genergy and Xstream) -
(Photo credit: Nic Bothma, winner of the
UNFCCC/CDM International Photo Contest 2008
Changing Lives)

Carl Wesselink, a human rights lawyer, and his brother Pieter, an ex-banker and head of SAEDF, were becoming increasingly interested in climate change because “it is an issue you think about if you have half a brain.” Although their initial idea was solar water heating and the normal business model would have been to “find a bloke who has an idea, a fantastic piece of intellectual property, and to help him with some money to bring it to scale and then to sell out, take our money, keep a 10% interest in the business”, they quickly realized that the problem in this industry was not the lack of ideas or manufacturing capacity but demand –

“people aren’t installing stuff.”

In order to “crack the demand”, Pieter Wesselink then created a solar water geyser financing model as part of a tender for a large proposed roll-out in the Nelson Mandela Bay Metropole, on the southern coast of South Africa. The initial model viewed the geyser as a loan or grant financed asset that generated ongoing income through household contributions from energy savings, and carbon credits earned from the reduction in carbon emissions. Although they

²⁴ Zuko Ndamane interview, 2 November 2009, Cape Town

²⁵ Steve Thorne interview, 3 November 2009, Cape Town

²⁶ An independently audited global best practice methodology that delivers high quality carbon credits of premium value with sustainable development co-benefits (Source: WWF (2009) Gold Standard. Available at

http://www.panda.org/what_we_do/how_we_work/businesses/climate/offsetting/gold_standard/)

²⁷ Carl Wesselink interview, 3 November 2009, Cape Town



were ultimately “*told to take a hike*” and excluded from the project implementation due to changes in the tender joint venture structure, the Wesselinks had developed the model and were keen to “*show that it would work.*” Commenting on the continued delay of that roll-out and the revised model that now excludes the 60% of low-income housing originally proposed, Carl Wesselink argues that “*the fact that public sector bodies and parastatals, charged with implementing renewable energy targets, are continuing to focus their attention on the upper-end of the market is incomprehensible.*”

FINAL BUSINESS PLAN AND FINANCIAL MODEL

As friends of Steve Thorne, the Wesselinks had become aware of the Kuyasa CDM project and although it “*wasn’t ideal*” as they “*wanted to do a cross subsidization across different income groups, and Kuyasa [was] just into RDP,*” they believed that “*it was a really important project that needed to be done... someone had to go and do it as it was just floundering.*” Over a weekend in mid-2007, they re-worked the Kuyasa CDM project implementation business plan to “*finish for about R30 million (US\$4 million)*” and presented it to the City of Cape Town and the DEAT. The key differences in the Wesselink plan, compared to the Agama one, were significant decreases in the administration and transport budget lines, a reallocation of some costs, such as Value Added Tax (VAT), to the materials/equipment budget line, and an upward adjustment in onsite management salaries.²⁸ The two main changes proposed in the Wesselink budget were a reduction in the capital costs per unit, by planning to source the solar water geysers at a lower cost, and the extensive use of local Kuyasa residents for installation and administration roles, after training from competent personnel.

Having already invested R1m (US\$133,333) in a business plan that argued that the project could not be done for less than R50 million (US\$6.7 million), the DEAT “*was sceptical.*” The SAEDF then offered to underwrite any cost over the R24 million (US\$3.2 million) DEAT grant and recover it over time in future income from residents and carbon credits. Their revised budget indicated that the R24m grant would be enough to complete installations in 1,238 houses (double the Agama estimate) and that the balance of 1,071 installations could be completed with around R9 million (US\$1.2 million), which was hoped could be sourced from the City of Cape Town or Western Cape Province, the contributing Kuyasa residents, and the CERs.²⁹ “*We would guarantee it, spend it, and recover it over time in future income that was the deal,*” recalls Carl Wesselink. Their business plan was accepted and they were appointed the implementer.³⁰

The financial model saw the total budget of around R33 million (US\$4.4 million) allocated to the installation of the solar water geysers (45% of budget), installation of insulated ceilings (46% of budget), and installation of CFLs (9% of budget). These allocations included equipment, materials, labour and training specific to each aspect. In addition to the R24

²⁸ SAEDF (2008) Business Plan, submission number: 30054.

²⁹ US\$1 = R7.50, as at 9 December 2009

³⁰ City official interview, 3 November 2009, Cape Town



million secured from the then DEAT (now the Department of Water and Environmental Affairs), the Western Cape Provincial Department of Housing and Local Government later contributed R4 million (US\$533,333). In terms of CER income, the project expected to generate just less than R1 million (US\$133,333) per year by selling the approximately 6,580 carbon credits, which would contribute to covering the SAEDF guarantee, as well as ongoing maintenance and monitoring.³¹

IMPLEMENTATION

One of the Wesselinks' first tasks was to convince Ndamane, who had been working as a research assistant in a poverty alleviation project at the University of Cape Town, while keeping two days a week open for the project as he *"just wanted to see this thing survive,"* that they were serious about completing the project, as he *"had heard that before, many a time."* It took three calls to convince Ndamane to meet with them and numerous assurances, before he was prepared in October 2007 to *"go out there to those local leaders and tell them that the project is coming through."*¹¹ Today, Ndamane refers to the Wesselinks as *"the doers, because they really showed character, they took that risk."*

The project's value proposition was thus to implement the retrofitting of the 2,309 existing RDP houses with solar water geysers, insulated ceilings and compact fluorescent light bulbs, within the revised budget of approximately R33m and using at least 30% of the budget on local job creation and skills development. Mostly unemployed members of the Kuyasa community were recruited and trained in carpentry, plumbing and electrical skills. The training was a mixture of in-house skills transfer, where an in-sourced technical expert would spend a week with the local team until they were competent enough to complete the installations, and outsourced accredited training so that the skilled workers also gained a certificate in their specific skill.²⁷

Although Wesselink and Ndamane came under pressure from local, municipal, ward, politicians to *"allocate employment according to the whole ward"*, and *"deploy people in the project,"*³² they held firm - sometimes spending hours discussing and explaining, and sometimes challenging them based on the clauses of the local political organisation's constitution. A typical installation by the local working team is as follows:

Day	Activity (some activities can occur in parallel)	Team
	Solar Water Heater steel frame assembly team	8 people
One	Electrical team completes wiring and electrics	5 teams of 2 people each
Two	Carpentry team do steel frame for ceiling	5 teams of 2 people each
Three	Geyser team install steel frame on roof to support geyser	2 teams of 2 people each
Four	Ceiling team do ceiling boards	5 teams of 2 people each
Five	Female members of team do cornices of ceiling	4 teams of 2 people each
Six	Plumbing team run pipes and install hot tap and geyser	4 teams of 3 people each
	Tree planting team	10 people

³¹ Carl Wesselink interview, 3 November 2009, Cape Town

³² Zuko Ndamane interview, 2 November 2009, Cape Town



In addition to the training provided for the local working team completing the installations, training is also provided by the project to “one person from each and every house”³³ in Kuyasa, including the usage and safety of the solar water geysers and compact fluorescent light bulbs, as well as employment-focused life skills. The energy efficient technology training, targeting 2,309 people, is delivered by Ndamane and the project team, while the life skills for this same group are facilitated through full-time trainers. To date 50 of these residents have been sent on specific employment-related training through the international humanitarian agency Catholic Relief Services. The job skills training for residents include hospitality and cleaning skills, and first-aid and emergency services skills, which Wesselink suggests is “fantastic training and about half of these people have landed full-time jobs.”

BUSINESS MODEL EVOLUTION

The original implementation plan made provisions for one light inside the house and another outside the house, with the relevant wiring. Carl Wesselink and Ndamane quickly realized, however, how dangerous this would be as residents were running small flex cabling and shaving the wires to access electricity for other lights and appliances, resulting in numerous open wires and connections lying around the house. Wesselink argued that there was no way the project was going to be done without plug points. The project now installs proper wiring for four lights, two double plug points, as well as energy efficient light bulbs and fittings in the bathroom, living space, sleeping space, and outside the door. As one resident of Kuyasa commented: “The tubing did a lot as well because we used to have that box and no tubing and then you would just take your own wires and put them there and as long as it comes to the TV and you would put your own globes, even if you have a small kid, she can’t just touch this thing and get hurt.”³⁴



The solar water geyser - (Photo credit: Michael Goldman)

As the project has evolved over the past two years, the focus has been on employing the most suitable technology that is affordable to the project. Initially the project struggled to purchase a solar water heater within the approximately R3,000 (US\$400) budget, until an imported ‘Genergy’ solar water geyser was found and sourced from a new local importer, with required approval from the South African Bureau of Standards (SABS).³⁵ A number of local manufacturers then offered their products, which were installed for testing at the project’s Kuyasa office. As Ndamane recalls, “I don’t know how many we have thrown away, and the Chinese one is still here... until we got this Xstream one

³³ Carl Wesselink interview, 3 November 2009, Cape Town

³⁴ Jackson Mabongo interview, 2 November 2009, Cape Town

³⁵ Carl Wesselink interview, 3 November 2009, Cape Town



(more than a year into the installations).” Manufactured locally by Hotmix (Pty) Ltd, the Xstream Vacustream is supplied to the project at R3,800 (US\$507). Unlike the 0.3-0.5ml stainless steel tin foil inner tank used in most low pressure models, the Xstream model employs a US Food & Drug Administration (USDA)-approved Derakane® Epoxy Vinyl Ester inner tank insulated with higher density polyurethane.³⁶ “It’s chalk and cheese,” suggests Wesselink, who also appreciates Hotmix’s owner, Dawie Thirion’s prompt service and openness to collaborate. The Xstream’s life-time guarantee against corrosion also contributes to Wesselink’s model of providing ongoing maintenance and repair. The enhanced quality, improved safety and higher service levels only slightly increased cost for approximately 1,000 ordered Xstream geysers. The domestic manufacturing was seen as a strong benefit to justify the increased total project budget and resultant slightly longer payback period for the SAEDF guarantee.

Table 1: Kuyasa Timeline

1999 - 2002	Kuyasa CDM project idea development
2003	Pilot phase of 10 installations
Late 2004	CDM project documents submitted
August 2005	Kuyasa CDM project registered
August 2006	Agama selected to prepare business plan for implementation
Late 2007	SAEDF appointed implementer with revised business plan
Early 2008	Remainder of 2,309 installations begin
Late 2009	1,800 installations completed
April 2010	Scheduled completion of 2,309 installations

Constraints faced

Fee collection

An important element of the Kuyasa CDM project business model is the monthly household contribution to the costs of the installation and ongoing maintenance. A community survey in late May 2008 indicated that every household would be prepared to contribute at least R30 (US\$4) per month, with some offering up to R300 (US\$40)³⁷. Wesselink decided to use R30 because “it was the lowest that anybody offered... on R30 per month we can pretty much make Kuyasa work financially.” These contributions would provide R831,240 (US\$110,832) in annual income to the project and would fully finance the budget shortfall within five years. The challenge lay in collecting the contribution. Ndamane cautioned that “the collection of this R30, it can be a nightmare if I go house to house... I will be inviting robbery and all that.” “It is the issue,” argues Wesselink.

Recent research suggests that 11 million South Africans (36% of the adult population) live on an average of R1, 300 (US\$173) per month and are mainly located in rural areas of the

³⁶ Kuyasa CDM Project: Status Report, September 2009

³⁷ Zuko Ndamane interview, 2 November 2009, Cape Town



country. Another 10 million people (34% of the adult population) earn an average of R2, 600 (US\$347) per month. These would typically be considered the urban poor. The remainder of South Africa's economic pyramid includes five million adults earning an average of R6, 000 (US\$800) per month and 31,000 adults living on an average of R11,000 (US\$1,467) per month.³⁸ In Khayelitsha, 54% of households include one to three people, 40% have four to seven people, with the remainder housing eight or more people.³⁹ As of 2001, 47% of households had an annual household income of R9, 600 (US\$1,280) or less, with another 25% of households surviving on between R9, 601 and R19, 200 (US\$2,560) per year.⁴⁰ More than 70% of households in Khayelitsha thus survived on less than R1, 600 (US\$213) per month.

One solution explored by the project thus far includes the use of an 'availability charge' on the pre-paid electricity meters in use in RDP houses. Pre-paid electricity meters were installed by Eskom in low-income houses that were connected to the electricity grid during the past 15 years. In order to use electricity, the household purchases a token from one of a number of retailers and enters the encoded 20-digit number using a keypad on the meter. Once the available credit is exhausted, the supply of electricity is cut off, until another token is purchased and entered. A pilot is currently being mooted with Eskom where Kuyasa residents make their contributions by paying an additional R7 (US\$0.93) per week via the meter before they can access 1kW of electricity. This contribution would then be redirected to the project.

An "*even simpler [solution] which government can implement tomorrow*", according to Wesselink, is to monetise the basic energy grant of 50kWh per month provided by the government to all low-income households, including the 2,309 in Kuyasa. Currently this in-kind grant, valued around R20 (US\$2.66) at current electricity prices of 34c/kWh, is enough to provide basic lighting, basic water heating using a kettle, basic ironing and access to a small black and white TV and radio.⁴¹ The proposal is for the value of this grant to be transferred, on behalf of the participating household, to the project in lieu of payment. These proposals are still being considered and Wesselink hopes "for a decision within the year as this would help unlock the financing needed for large-scale roll-out and shift at least 50% of the risk in servicing this market segment to the State, where it more appropriately belongs."¹⁸ Eskom's most recent multi-year price application increase to the National Energy Regulator of South Africa (NERSA) suggests that the electricity price will increase to 43c/kWh during 2010, 55c/kWh in 2011 and 70c/kWh in 2012.⁴² This may make the proposed solution even more appealing.

³⁸ Chipp, K. and Corder, C. (2009), Where practice meets theory: defining and reviewing the bottom of the pyramid for South African marketers. International Base of the Pyramid Conference, Gordon Institute of Business Science, Johannesburg

³⁹ ³⁹ Business Trust. (2007) Nodal Economic Profiling Project: Khayelitsha. Available from: <http://www.btrust.org.za/index.php?id=185>

⁴⁰ *ibid*

⁴¹ Department of Minerals and Energy. (2004) Free Basic Energy Policy Guidelines. Available from: http://fbs.dplg.gov.za/fbs/site/docs/DocumentLibrary/FBE/FBE_guidelines.pdf?PHPSESSID=ba2fc5b7d282940898dab7f61abdde5e

⁴² Makwana, M. (2009) Media Briefing on MYPD2. Available from: <http://www.eskom.co.za/content/FINALMYPDmediabrief-4.pdf>



Accidental risks



Tempering valve - (Photo credit: Michael Goldman)

The relationship with Hotmix's Thirion has also addressed another concern with the original plan – the extraordinary efficiency and 90°C (194°F) temperature water provided by most low pressure solar water geysers. Ndamane and Wesselink grew increasingly concerned about the risk of a serious domestic accident with a child being exposed to this near boiling water. Wesselink argued that children burn themselves with even normal thermostatically-controlled 55°C (131°F) water and that he “*can't have that*” on his conscience. In response, Thirion designed a patented system that employs a R500 (US\$67) tempering valve to mix the 90°C water with cold water from an additional separate container built onto the Xstream Vacustream solar water geyser, and delivered to the tempering valve at the same pressure as the heated water.

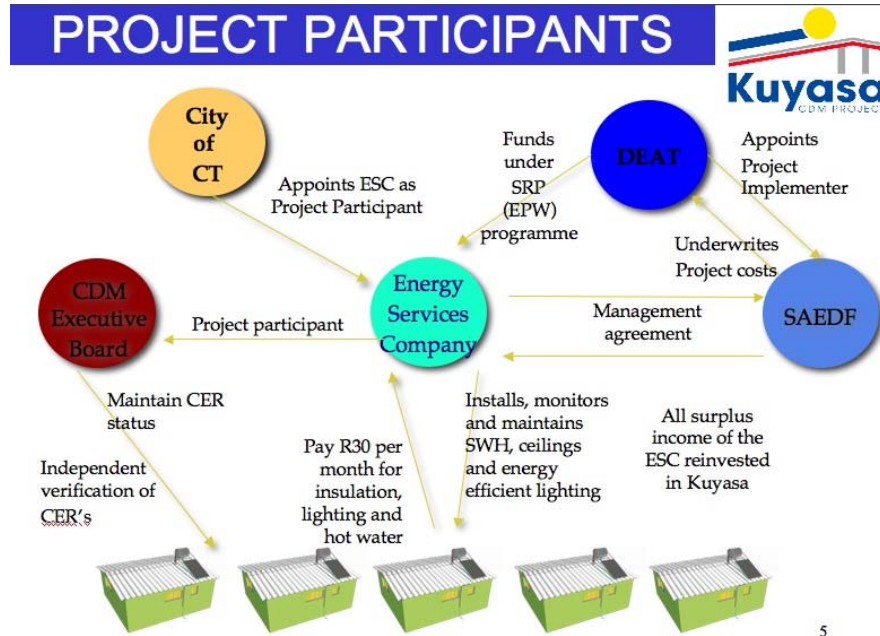
Given the limited and costly supply of the required tempering valve, manufactured in New Zealand, the supplier is setting up a tempering valve manufacturing facility within the Southern African Development Community (SADC). They have identified a suitable forge in Swaziland, a landlocked neighbouring country that can manufacture and supply casings for assembly in South Africa at almost half the current price. The cost implications of adding the tempering valve, and related tank and pipes, to existing Genergy installations has meant that those households will only benefit from this innovation in a few years when their geysers need to be replaced. The imported geysers come with a two year guarantee from the importer, and Wesselink expects them to “*last five years, maybe ten.*”

The Business and its Relationships

The Kuyasa CDM project is a partnership between the City of Cape Town, the national Department of Water and Environmental Affairs (DWEA), the Provincial Department of Housing and Local Government, the SAEDF and the community of Kuyasa. It was Steve Thorne's efforts to establish this CDM project that brought all the partners together. The national and provincial departments provided the funding and, together with the City, were motivated to “*improve the lot of the communities.*”¹⁶ Although the City has input on the project, they see themselves “*standing on the sidelines watching things go by.*”¹⁶ The DWEA requires that maintenance and monitoring be undertaken and paid for by the City out of the carbon credit income. Wesselink believes that the DWEA “*has been fantastic to deal with, fairly efficient and responsive.*” He has been encouraged by their emphasis on “*servicing the end goal as opposed to servicing the process.*”²⁷



Figure 3: Relationship between critical actors



Source: SAEDF: Proposed structural relationships

The Kuyasa CDM project “fits perfectly”⁴³ within the objective of the SAEDF to create local manufacturing demand to offset an import. It is also driven strongly within the SAEDF by the Wesselink’s “willingness to take a risk, work in this, come to the party and give the product at beneficial rates.”⁴⁴



Zuko Ndamane, at the CDM office (Photo credit: Michael Goldman)

The relationship between the community and SAEDF is managed through Mr. Zuko Ndamane, who works from the Kuyasa CDM project office in Kuyasa, and still lives in Kuyasa. Ndamane and his local working team enjoy widespread support and respect within the community. Wesselink believes that “it was always about creating a model where this community felt a sense of ownership and responsibility for these installations.” Ndamane agrees: “the fact that people have to contribute towards this gives them a sense of ownership... if they see small kids throwing stones on top of their

⁴³ Carl Wesselink interview, 3 November 2009, Cape Town

⁴⁴ City official interview, 3 November 2009, Cape Town



house they go mad!” A local working team was built around Ndamane, who Wesselink recognized as having “gravitas... they think he is fantastic.” Ndamane recalls situations where “one of our guys left material in a certain house and they can’t remember where they left it. The people there will call me and say ‘I have got your tools here’, this address, who was working there and they will describe the guy because they have uniforms, and they will definitely go and pick up and nothing will be stolen.”

South Africa has experienced an increased number of service delivery protests during 2009, which have been seen as evidence of the alienation of citizens from local government.⁴⁵ The government’s own analysis suggests that there is “*now a lack of citizen confidence and trust in the system.*”⁴⁶ By July 2009, the Western Cape Province had experienced 12% of the service delivery protests, which by that point totalled 52 for the country in 2009. Research suggests that population growth; urbanization, housing administration, service costs, and councillor arrogance and insensitivity to the needs of the community are key concerns of residents. Ndamane agrees, suggesting “*if you tell them that they are not getting electricity this year but getting streets, hence they are now building streets there, and they will never be a pain – as long as they know.*” The relationship between the community and the different levels of government has thus been strained due to delays in delivering services and poor communication around policies and progress.

The relationship between the SAEDF and the City is seen as collaborative, “*although [ultimately SAEDF] have to meet DWEA’s requirements, [not ours],*”⁴⁷ in terms of regular reporting and audits as per the implementation contract. Although the City thinks highly of the SAEDF, arguing that “*bringing the project to this point with the amount of funding they had is quite exceptional,*”⁴⁸ the relationship has taken some strain due to differences in approach.

A frustration for Wesselink is the perceived “*slow application of the City’s own policy*” - of “*implementing energy efficiency and renewable/cleaner energy sources*”⁴⁹, including the “*installation of solar water heaters on City-owned housing*”⁵⁰ - in its choice of electric, not solar, geysers for their proposed renovation of 40,000 council houses. Wesselink believes that the actions of “*one maverick department head*” could cost the City the opportunity to accept accolades for the “*largest single solar water geyser installation in South Africa*” while providing more affordable hot water to the low-income families living in them.

⁴⁵ Mabudafhasi, R.T. (2009) Keynote address by Deputy Minister Mabudafhasi at the Kuyasa Clean Development Mechanism Project, Solomon Mahlangu Hall, Kuyasa Khayalitsha, 25 November 2009.

⁴⁶ State of Local Government in South Africa: Overview Report. (2009) Cooperative Governance & Traditional Affairs

⁴⁷ City official interview, 3 November 2009, Cape Town

⁴⁸ *ibid*

⁴⁹ Ward, S. (2009) The City of Cape Town’s Energy and Climate Change Strategy. UEMP Conference. Available at http://www.uemp.org.za/uemp_docs/UEMP_AC2009_CT_Sarah_Ward.pdf

⁵⁰ City of Cape Town. (2006) Energy and Climate Change Strategy. Available from http://www.capetown.gov.za/en/EnvironmentalResourceManagement/publications/Documents/Energy_+Climate_Change_Strategy_2_-_10_2007_301020079335_465.pdf



Results Created by the Business

ECONOMIC IMPACT

The Kuyasa CDM project head office in Cape Town is staffed by six people, including Carl Wesselink. The project has also created 87 job opportunities for local residents in Kuyasa, including Zuko Ndamane. To date, approximately 1,800 of the 2,309 RDP houses in Kuyasa have received the complete installation of solar water geysers, insulated ceilings and compact fluorescent light bulbs. At the ‘official launch’ of the project on 25 November 2009, the DWEA Deputy Minister Mabudafhasi, remarked that the project was “*a shining example of the successes of our endeavours to create a better life for all.*”⁵¹

Although a hard study has not yet been completed on the impacts of the entire project, the key actors all point to significant economic, health, environmental and social benefits observed thus far. Besides the 87 job opportunities created in Kuyasa, the economic benefits for the residents of Kuyasa also include the reduction of energy costs from purchasing less paraffin and less pre-paid electricity. Ndamane recalls the case of one member of the community who previously spent around R500 (US\$67) per month on 50 litres of paraffin, but is now spending less than R25 (US\$3.30) per month on around 2 litres of paraffin. Another resident reported a drop in electricity usage and spends from R100 (US\$13.33) to R70 (US\$9.33) per month.³⁴ A SSN case study on the project in 2007 suggested an energy cost saving of R625.83 (US\$83.44) per household per year.⁵²

SOCIAL IMPACT

For the City, the joint benefits of hot water for hygiene and cleanliness, and of insulation for health and comfort, are seen as most important. Wesselink agrees strongly with the benefit of the “*revolution*” of insulation: “*a house without insulation is what we do for farm animals.*” Ndamane echoes this view and doesn’t understand “*why the municipality approved these houses, they were not like a house that someone can live in.*” Wesselink points to the “*massive condensation on the roof sheeting, which then drops down creating a damp clammy environment that is a fantastic breeding ground for disease, respiratory problems and Tuberculosis*” and challenges others whether they can “*imagine living like that.*” Thorne’s review of the academic literature suggests “*the carbon benefits are a quantum lower than the health benefits of doing mitigation.*” He highlights that the “*fuels and particulates and the kind of things that get into the air that causes cancers,*” which are reduced by the thermal comforts introduced.

⁵¹ Mabudafhasi, R.T. (2009) Keynote address by Deputy Minister Mabudafhasi at the Kuyasa Clean Development Mechanism Project, Solomon Mahlangu Hall, Kuyasa Khayalitsha, 25 November 2009.

⁵² Malgas, L. (2007) Kuyasa Low Cost Housing Energy Upgrade Project. Available at http://reep-sa.org/casestudies/doc_details/23-kuyasa-cdm-project



“It is nice and warm in the house and our furniture is always clean now, even if you want to clean it, it is not like that before. Even the TV and all that stuff, you used to put on something so it can’t be damaged with that sand.”

Jackson Mabongo, Kuyasa resident

ENVIRONMENTAL IMPACT



Installations – (Photo credit: Nic Bothma, winner of the UNFCCC/CDM International Photo Contest 2008 Changing Lives)

In terms of the environmental and energy impact of the Kuyasa CDM project, SouthSouthNorth point to the “tiny” amount of approximately 6,580 tons (2.85 tons per household measured in pilot phase)⁵³ of carbon reduction per year (equal to just less than R1 million (US\$133,333)). Thorne believes that the project has created a “focus of attention” for dealing with renewable energy in households and throughout the country, through carbon credits. Wesselink also believes that the costs of building a new power station to provide peak

demand energy to the three million RDP houses in South Africa, estimated at over R125 billion (US\$16.7 billion), far outweighs the approximately R30 billion (US\$4 billion) it would have cost to roll out the Kuyasa-type installations to all of them.

The broader social benefit of the project is captured in Wesselink’s view of the impact on the fabric of society: “I used to talk about climate change, then solar water heaters and the revolution of insulation and comfort and thermal efficiencies: I now talk about dealing with the burden of life.” He argues that the sense of everyone being “down”, that Ndamane noticed eight years ago, is borne out in the statistic that 32% of the residents of Khayelitsha are estimated to be depressed, which leads to “a sense of can’t do, of complete apathy.”⁵⁴ Recent research found that over one third of new mothers in Khayelitsha suffer from postnatal depression – around three times as many as in industrialized countries.⁵⁵ Linking the depression to the inability for people to create economies for themselves and the social value of the project, Wesselink believes that they are creating “an environment in which people can thrive, having energy and drive to go and do something, to create something.”

⁵³ Booi, M. (2005) “Appendix A¹ to the simplified modalities and procedures for small-scale CDM project activities” Project Design Document for Project 0079: Kuyasa low-cost urban housing energy upgrade project. Available at: http://cdm.unfccc.int/UserManagement/FileStorage/FS_292989657.

⁵⁴ Carl Wesselink interview, 3 November 2009, Cape Town

⁵⁵ Cooper, P.J., Tomlinson, M., Swartz, L., Woolgar, M., Murray, L. and Molteno, C. (1999) Post-partum depression and the mother-infant relationship in a South African peri-urban settlement. *The British Journal of Psychiatry*, 175(6), 554-558.



Growth Strategy and Future Outlook

As it stands currently, Ndamane and the rest of the Kuyasa work team will be unemployed after the 2,309 installations are completed in the first quarter of 2010. The hope is that the maintenance and monitoring phase of the project will then begin, initiated by the City. It is the City's understanding that *"the ability that has been generated should be used in the maintenance and monitoring,"*⁵⁶ suggesting that Ndamane and some of his colleagues will continue to be involved.

An important aspect of the maintenance and monitoring phase of the project will be structuring and contracting between the City and the entity responsible for this ongoing work. Section 33 of the Municipal Finance Management Act (MFMA) constrains the City to *"not engage with anyone for more than three years, unless it can be proven that there are definite benefits."*⁵⁷ Given some pending retirements, the City is apprehensive about the *"number of hoops you have to jump through"* to enter into a longer-term agreement. Although the City is *"going to decide how this is going to be done because it is the City's project and the City's responsibility – if carbon income is going to be realized – to look after this aspect,"* it is currently *"not quite sure how we are going to go about it yet."*⁵⁸

At a broader level, Wesselink and Thorne are hoping to scale this by launching a *"national sustainable settlements facility"*⁵⁹ (NSSF) based on the *"pioneering model"*⁶⁰ tested in Kuyasa. The aim of the facility will be to *"provide financing, disbursement and monitoring mechanisms for solar water heaters and thermal performance improvements in subsidized housing, enabling government to legislate their inclusion in its subsidized housing programme."*⁶¹ The idea is to recruit public sector partners in order to raise *"soft loan finance"*⁶² to facilitate *"the retrofitting of the country's other two million low-cost homes."*⁶³ The Development Bank of South Africa (DBSA) has already come on board, and the idea has also received support from DANIDA, the Dutch Ministry of Foreign Affairs and the national Department of Human Settlements. The NSSF has also proposed to National Treasury that 50% of the capital costs be written off, which will enable the large-scale installations to be fully funded by the carbon credits.

Working off the 2.85 tons of CO² emissions reductions per low-income household per year, demonstrated through the pilot phase of the Kuyasa CDM project, and taking the current

⁵⁶ City official interview, 3 November 2009, Cape Town

⁵⁷ *ibid*

⁵⁸ *ibid*

⁵⁹ Carl Wesselink interview, 3 November 2009, Cape Town

⁶⁰ Mabudafhasi, R.T. (2009) Keynote address by Deputy Minister Mabudafhasi at the Kuyasa Clean Development Mechanism Project, Solomon Mahlangu Hall, Kuyasa Khayalitsha, 25 November 2009.

⁶¹ National Sustainable Settlements Facility: Briefing Note, 17 September 2008

⁶² Carl Wesselink interview, 3 November 2009, Cape Town

⁶³ Mabudafhasi, R.T. (2009) Keynote address by Deputy Minister Mabudafhasi at the Kuyasa Clean Development Mechanism Project, Solomon Mahlangu Hall, Kuyasa Khayalitsha, 25 November 2009.



European Climate Exchange average price of €13⁶⁴ (R140.79; US\$18.59)⁶⁵ into consideration, the NSSF should be able to finance two million additional solar water heaters and thermal performance improvements, of the anticipated three million low-income houses required in the coming years, it will generate almost R800 million (US\$106 million) per year from carbon credits.

But Wesselink also argues that the facility will need private sector “*energy to drive it and make it happen.*” His greatest fear is that “*someone decides to take the carbon credits windfall, instead of reinvesting it where it belongs in more gizmos, more installations, and then ultimately back into the community by planting trees, building day-care centres or doing the maintenance that needs to be done.*” The facility will also set-up the mechanism for property developers to employ renewable energy efficient technologies in the building of new houses. Thorne argues that the “*performance can be greatly improved and costs reduced if you intervene before the houses are built.*”

A final opportunity that the project has triggered is the application of the Kuyasa working team’s skills and experiences on private sector renewable energy efficiency contracts. Initial discussions have been had with a microfinance institution that lends money for home improvements, to consider using the Kuyasa team for the installation.⁶⁶

⁶⁴ Average CER futures and options prices for December 2009. Available at: <http://www.ecx.eu>.

⁶⁵ €1 = R 10.83 and US\$ 1.43 as at 20 December 2009

⁶⁶ Carl Wesselink interview, 3 November 2009, Cape Town



References

INTERVIEWS

- Mabongo, Jackson. Kuyasa resident. Cape Town. Nov. 2, 2009.
- Ndamane, Zuko. Site Manager, Kuyasa CDM Project. Cape Town. Nov. 2, 2009.
- Thorne, Steve. Country Leader South Africa, SouthSouthNorth. Cape Town. Nov. 3, 2009.
- Wesselink, Carl. Head of Sustainable Division, South African Export Development Fund (SAEDF). Cape Town. Nov. 3, 2009.

PUBLICATIONS

- Chipp, K. and Corder, C. (2009). *Where practice meets theory: defining and reviewing the bottom of the pyramid for South African marketers*. International Base of the Pyramid Conference. Gordon Institute of Business Science. Johannesburg.
- Cooper, P.J., Tomlinson, M., Swartz, L., Woolgar, M., Murray, L. and Molteno, C. (1999). *Post-partum depression and the mother-infant relationship in a South African peri-urban settlement*. The British Journal of Psychiatry, 175(6), 554-558.
- Kuyasa CDM Project: Status Report, September 2009
- Mabudafhasi, R.T. (2009). *Keynote address by Deputy Minister Mabudafhasi at the Kuyasa Clean Development Mechanism Project*. Solomon Mahlangu Hall. Kuyasa Khayelitsha. Nov. 25, 2009.
- National Sustainable Settlements Facility: *Briefing Note*. Sept. 17, 2008.
- SAEDF. (2008). *Business Plan*, submission number: 30054.
- Schneider, M. (2008). *Ins and outs of CDM*. Financial Mail. Oct. 17, 2008.
- Schneider, M. (2009). *The Road Ahead*. Financial Mail, Oct. 17, 2008.
- Schneider, M. (2009). *Tough Love*. Financial Mail. Oct. 16, 2009.
- *State of Local Government in South Africa: Overview Report*. (2009) Cooperative Governance & Traditional Affairs.

WEBSITES

- Booi, M. (2005) *Appendix A to the simplified modalities and procedures for small-scale CDM project activities*. Project Design Document for Project 0079: Kuyasa low-cost urban housing energy upgrade project.
http://cdm.unfccc.int/UserManagement/FileStorage/FS_292989657.
- Business Trust. (2007). *Khayelitsha Nodal Economic Development Profile*.
<http://www.btrust.org.za/index.php?id=185>.
- Business Trust. (2007). *Nodal Economic Profiling Project: Khayelitsha*.
<http://www.btrust.org.za/index.php?id=185>.
- City of Cape Town. (2006). *Energy and Climate Change Strategy*.
http://www.capetown.gov.za/en/EnvironmentalResourceManagement/publications/Documents/Energy + Climate Change Strategy 2 - 10_2007_301020079335_465.pdf.



- Department of Minerals and Energy. (2004). *Free Basic Energy Policy Guidelines*. http://fbs.dplg.gov.za/fbs/site/docs/DocumentLibrary/FBE/FBE_guidelines.pdf?PHPSESSID=ba2fc5b7d282940898dab7f61abdde5e.
- Department of Provincial and Local Government. (2006). *Preliminary Impact Assessment for the Khayelitsha Mitchells Plain Urban Renewal Programme*. http://www.capetown.gov.za/en/urbanrenewal/Documents/URP_-_Preliminary_Impact_Assessment_for_the_Khayelitsha_Mitchells_Plain_-_PDF_682007153323_.pdf.
- Makwana, M. (2009). *Media Briefing on MYPD2*. <http://www.eskom.co.za/content/FINALMYPDmediabrief~4.pdf>.
- Malgas, L. (2007). *Kuyasa Low Cost Housing Energy Upgrade Project*. http://recep-sa.org/casestudies/doc_details/23-kuyasa-cdm-project.
- Telnes, E. (2005). *CDM Project Activity Registration and Validation Report Form: Kuyasa low-cost urban housing energy upgrade project*. http://cdm.unfccc.int/UserManagement/FileStorage/FS_868347409.
- United Nations Framework Convention on Climate Change. (2006). *Report to the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol on its first sessions*. Montreal. Nov. 28 to Dec. 10, 2005. <http://cdm.unfccc.int/Reference/COPMOP/08a01.pdf#page=43>
- United Nations Framework Convention on Climate Change. (2008). *Clean Development Mechanism: 2008 in Brief*. http://unfccc.int/resource/docs/publications/08_cdm_in_brief.pdf.
- Wanneburg, G. (2008). *Eskom news could hurt economy more*. Cape Argus, pg. 3. Nov. 4, 3008. http://www.iol.co.za/index.php?set_id=1&click_id=3053&art_id=vn20081104120316298C888260.
- Ward, S. (2009). *The City of Cape Town's Energy and Climate Change Strategy*. UEMP Conference. http://www.uemp.org.za/uemp_docs/UEMP_AC2009_CT_Sarah_Ward.pdf.
- World Bank. (2009). World Development Indicators database. Gross domestic product (2008). <http://siteresources.worldbank.org/DATASTATISTICS/Resources/GDP.pdf>
- WWF (2009) *Gold Standard*. http://www.panda.org/what_we_do/how_we_work/businesses/climate/offsetting/gold_standard/



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