

Clean Development Mechanism South Africa  
Designated National Authority



energy

Department:  
Energy  
**REPUBLIC OF SOUTH AFRICA**

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## Project Design Document (PDD)

Project reference number (office)	
Date received (office use only)	

### NOTES ON COMPLETING THIS PROJECT DESIGN DOCUMENT

1. Please provide this PDD in both hard-copy (one copy) and electronic formats (MSWord)
2. The information submitted to the DNA in this PIN will remain confidential.

### Part A: Project Proponent Details

<b>Project Name</b>	Refrigeration Plant Efficiency Programme of Activities
<b>Date of Submission of PDD</b>	13/5/12

Project Developer	
<b>Name</b>	Standard Bank Plc
<b>Organizational Category</b>	Public Company
<b>Legal Status</b>	Public Company
<b>Street Address</b>	Registered Office: 20 Gresham Street, London, EC2V 7JE, United Kingdom
<b>Postal Address (if different from above)</b>	As above
<b>Website Address</b>	www.standardbank.com
<b>Main Activities</b>	Standard Bank Group is a global bank with African roots. It is South Africa's largest bank, distinguished by its extensive operations in 17 African countries. Outside the African continent, Standard Bank Group operations span to 15 countries. Standard Bank develops

	integrated financial solutions utilising carbon credits for both carbon credit traders and companies involved in sustainable development projects across sectors, with a specific focus on emerging markets.
<b>Summary of Financial Performance in last fiscal year</b>	Total assets 2010: 840,423 (Rm) Revenues 2010: 38,699 (Rm) Profits 2010: 7,988 (Rm)
<b>Contact Person(s)</b>	Geoff Sinclair
<b>Telephone</b>	Work: +44 (0)20 3145 6893
<b>Fax</b>	
<b>Email Address</b>	<a href="mailto:geoff.sinclair@standardbank.com">geoff.sinclair@standardbank.com</a>
<b>Project Partners</b> Provide the following information for all project partners (copy and paste relevant sections of the table if information is to be provided on more than one partner organisation)	
<b>Name</b>	Energy Partners
<b>Nature of partner</b>	Energy Partners are the 'SSC-CPA Implementer' for the first CPA under this proposed Program of Activities (PoA). Energy Partners was formed in 2010 and is one of Africa's leading Energy Service Companies (ESCO's).
<b>Organizational Category</b>	Private Company
<b>Legal Status (if private company)</b>	Limited company
<b>Street Address</b>	The Cliffs Carl Cronje Drive Cape Town 7530 South Africa
<b>Postal Address (if different to Street Address)</b>	Energy Partners Postnet Suite 25, Private Bag X22 Tygervalley, 7536
<b>Website Address</b>	<a href="http://www.energypartners.co.za/">http://www.energypartners.co.za/</a>
<b>Main Activities</b>	Energy Partners was established in March-2010 to support business owners to achieve maximum energy efficiency through: establishing the right strategic & operational objectives to enable a holistic energy efficiency solution design; facilitating the design & implementation of the energy efficiency solution by working with global specialists; sourcing the least expensive finance to mobilize implementation of the energy efficiency solution; claiming all incentives to further improve project ROI; and providing on-going efficiency monitoring and control to ensure savings are sustained

	and improved upon.
Contact Person(s)	Erik Wandrag
Telephone	Work: (021) 918 4980
Fax	(021) 914 7213
Email Address	<a href="mailto:erik.wandrag@energypartners.co.za">erik.wandrag@energypartners.co.za</a>
<b>Contractual Arrangements</b>	
Contractual arrangements between various entities involved	Standard Bank and PicknPay have a legal agreement that provides PicknPay with access to the Programme of Activities and places certain obligations on PicknPay. Energy Partners is contracted to PicknPay for energy efficiency consulting.

## Part B: Project Overview (Technical Summary, Location and Schedule)

<b>Technical Summary of the project</b>	
Objective of the Project	<p>The objective of the PoA is to install technologies that improve the energy efficiency of refrigeration in commercial buildings in a manner compliant with CDM requirements.</p> <p>The PoA is intended to include multiple countries, with the foundation country being South Africa. The first CDM Project Activity (CPA) will be the Energy Partners refrigeration plant efficiency improvements in PicknPay stores (South Africa's second largest food retailer) across South Africa.</p>
<b>Project Description</b>	
<p>CPA's under the PoA will install technologies that improve the energy efficiency of refrigeration in commercial buildings. The PoA will encompass a range of technologies with the specifics of each being detailed in each CPA. To illustrate the main activities and processes involved in a typical CPA - details of CPA 1 are provided below.</p> <p>There are 6 key steps involved in the process for installing refrigeration energy efficiency measures in PicknPay stores across South Africa under CPA 1. These being:</p> <p><b><u>1. Detail site audits</u></b></p> <p>A site inspection, gathering information from the refrigeration contractors on installed equipment, reviewing operating conditions &amp; set- points, confirming required cooling capacity and establishing a general condition of the plant is undertaken.</p> <p><b><u>2. Detail kWh consumption:</u></b></p> <p>Detailed technical and performance data of the existing plant is accessed from currently used meters and/or is obtained from the refrigeration contractors. This data is used to determine baseline energy consumption and emissions.</p> <p><b><u>3. Design Process:</u></b></p> <p>All the above information is processed, analysed and used as input to the design process. Proposed energy efficiency technologies are presented to the PicknPay for review and final selection.</p> <p><b><u>4. Design Sign-off:</u></b></p> <p>The final design of the refrigeration installation also takes into consideration multiple design criteria that</p>	

## Technical Summary of the project

are finalised in collaboration with the local refrigeration contractors. This is a determining factor in guaranteeing the correct design, installation, sign-off, operation and monitoring of the installations. The final design is then presented to the contractors for final costing, negotiations, placement of orders and finalisation of contracts by PicknPay.

### **5. Implementation**

Technologies are procured and the local refrigeration contractors install the technologies with overall project management from Energy Partners.

### **6. Monitoring**

Energy use is then monitored and evaluated over a 3-month period to ensure successful implementation and sign-off of each site. Monitoring of a representative sample of sites is then undertaken for the life of the CPA.

### **Project Constraints**

Potential project constraints will be particular to each CPA developed. As an illustration of typical constraints, constraints for CPA 1 are described below.

With CPA 1 potential constraints include client approval, client access to financing, availability of hardware, capacity of local refrigeration contractors to install equipment and capacity to conduct ongoing monitoring. All of these constraints have been tested through delivery of a pilot project and can be managed successfully in the implementation of CPA 1.

### **Technology to be employed**

#### **Technology Description**

Potential project technologies will be particular to each CPA developed. As an illustration of typical project technologies, technologies to be used in CPA 1 are described below.

CPA 1 will utilise a combination of 6 technologies at each site - 4 technologies that improve plant efficiency and 2 technologies that reduce plant load.

The technologies that will improve plant efficiency are: plant controllers; electronic expansion valves; variable speed drives; and anti-sweat heater controls.

The technologies that reduce plant load are automatic night blinds and plant room ventilation.

#### **Technology previously tried and tested?**

As an illustration of CPA technologies, the technologies to be used in CPA 1 have been tried and tested over several years in all climates, local and abroad.

#### **Project operators previous experience with operating the technology?**

As an illustration of a typical CPA project operators experience, for CPA 1 Energy Partners are South Africa's leading ESCO and have extensive experience in developing and managing these types of projects and technologies. Energy Partners have successfully delivered a pilot program using the described technologies and implementation process.

### **Greenhouse Gases Targeted**

The technologies deployed under this PoA will reduce the need for electricity. The electricity supplied by the grid in participating countries will be, to varying degrees, fossil fuel based. Therefore indirectly GHG emissions from grid-connected power plants will be reduced. As such the main GHG targeted will be CO<sub>2</sub>.

### **Emission reductions**

Potential emissions reductions for the PoA will depend on the

Technical Summary of the project	
	<p>quantity of emission reduction for each CPA and the number of CPAs included in the PoA over time.</p> <p>As an illustration of typical CPA emission reductions, it is forecast that CPA1 will achieve an average annual emission reduction of 43,233tCO<sub>2</sub> and total emission reductions of 302,631tCO<sub>2</sub> over the first 7-year crediting period.</p>
<p><b>Baseline &amp; Additionality Assessment</b></p>	<p><b><u>Baseline</u></b></p> <p>As per the approved methodology to be applied (AMS II.E) the energy baseline will consist of the energy use of the existing equipment. In the case of CPA 1 this will be established using historic data.</p> <p>The emission baseline will be established by multiplying the energy baseline by an emission coefficient. The emission coefficient will be calculated in accordance with provisions under AMS- I.D.</p> <p><b><u>Additionality</u></b></p> <p>The PoA will use a small-scale methodology, and as such will assess additionally against one or more of the barriers listed in 'Attachment A to Appendix B to Annex II of 4/CMP.1'. As each CPA may deploy different technologies with the aim of improving refrigeration efficiency it is not feasible to undertake an investment analysis at a PoA level.</p> <p>Using CPA1 as an illustration of the approach to demonstrating additionality – energy efficiency measures in South Africa (as for many African countries) face a number of significant barriers to up-take, including access to finance, prevailing practices, lack of knowledge and split incentives. The '<i>Tool for the demonstration and assessment of additionality</i>' (Version 5.2)' will be used at a PoA and CPA level to explore these barriers and demonstrate additionality.</p>
<p><b>Monitoring</b></p>	<p>As per the approved methodology to be applied (AMS II.E) monitoring of CPAs in the PoA will entail documenting the specifications of the existing equipment and directly measuring through metering equipment the energy use of the retrofitted refrigeration equipment within the project boundary.</p> <p>Each CPA will have its own detailed monitoring plan. As an illustration of a typical CPA monitoring approach, monitoring to be used in CPA 1 is described below.</p> <p>CPA 1 will use a metering solution, which consists of Main- and Sub-metering. These meters will record data at regular intervals (e.g. 30min intervals), are read daily and data stored on a database.</p> <p>For 3 months post implementation direct energy use at all sites will be monitoring using the above described meters. For the crediting period of the CPA a representative sample of sites will be monitored using the above described meters. Representation and sample size will be determined in accordance with 'EB 50, Annex 30 – 'General Guidelines for Sampling and Surveys for Small Scale CDM Project Activities'.</p>
<p><b>Type of project/activities</b></p>	

<b>Technical Summary of the project</b>	
a. Energy Supply	Not applicable
b. Energy Demand	Improvement of energy efficiency of existing equipment. The objective of the PoA is to install technologies that improve the energy efficiency of refrigeration in commercial buildings.
c. Industrial Process	Not applicable
d. Transport	Not applicable
e. Waste Management	Not applicable
f. Forestry/ land use	Not applicable
g. Other	Not applicable
<b>Project Boundary</b>	
As per the approved methodology to be applied (AMS II.E) the project boundary is the physical, geographic site of the buildings where CPAs are implemented. For CPA 1 this will be the network of PicknPay stores across South Africa.	
Indicate Emissions outside the Project Boundary	Not applicable

<b>Location of the Project</b>	
Province	The PoA will be multinational with South Africa being the first country it operates in. CPA 1 will be across South Africa.
Municipality	As above
Nearest city/large town	As above
Brief description of the location of the project site	The PoA will be multinational with South Africa being the first country it operates in. CPA 1 will be implemented in up to 167 PicknPay stores across South Africa.

<b>Project Schedule/Timetable</b>	
Earliest Project Start Date	CPA 1 - May 2012
When is the expected first year of CER delivery	CPA 1 - 2013
Project Lifetime	The PoA will have an operation lifetime of 28 years. CPA1 will have an operational lifetime of up to 21 years.
Project End Date	CPA1 May 2032
Crediting Period	CPA 1 will have a crediting period of 3X7 years
Current Status or phase of the project	CPA 1 has been planned and a pilot conducted in one PicknPay store. Planning and preparation for an at scale rollout is well progressed

Project Schedule/Timetable	
DNA Approval	A PIN application was made to the SA DNA on 26/9/2011 and a Letter of No Objection was received on the 27/10/2011.
Approval by other bodies	The project in CPA has been submitted to ESKOM for consideration for Demand Side Management funding assistance. Approval has been given for 8 stores and the M&V process was been initiated at the end of August 2011.

## Part C: Performance Against the DNA's Sustainable Development Criteria

South Africa has identified the following sustainable development criteria and indicators against which each CDM project will be assessed. Please provide your interpretation of how this project will address each of these **criteria and indicators** where they are relevant to the project. If the space provided is not sufficient please append additional information as required.

**NOTE:** For all indicators which are of relevance to the project show how the performance of the project against these indicators can be objectively monitored and measured on an ongoing basis.

### 1. Economic: Does the project contribute to national economic development?

This PoA will contribute significantly to the economic development of the participating countries through encouraging the more efficient use of electricity by large commercial energy consumers who use refrigeration plants. Energy savings at both individual building and national levels make important contributions to the countries' economic efficiency and sustainability, particularly in the context of the rising demand for electricity currently occurring in South Africa.

### 2. Social: Does the project contribute to social development in South Africa?

The PoA has two key contributions to social development in South Africa: 1) Job creation, and 2) technology transfer.

The PoA has the ability to create jobs in installation of efficiency technologies and in the provision of monitoring services.

The PoA has positive implications for the transfer of technology to South Africa. The PoA will encourage development of energy efficiency business models that may be new. This allows for the linking of the installation of cutting edge energy efficient products to a range of value added services, including installation, maintenance and convenient financing terms. In addition to the transfer and development of new business models, the PoA will also facilitate the transfer of leading energy efficiency refrigeration technology into South Africa.

### 3. Environmental: Does the project conform to the National Environmental Management Act principles of sustainable development?

Please provide brief comment for each of these below.

i) That the **disturbance of ecosystems and loss of biological diversity** are avoided, or where they cannot be avoided, are minimised and remedied

The PoA will have no negative effect on ecosystems or loss of biodiversity.

ii) That **pollution and degradation of the environment** are avoided, or where they cannot be altogether avoided, are

The PoA will reduce CO<sub>2</sub> and other airborne pollutants that are a result of fossil fuelled powered energy generation – as the PoA will introduce energy efficient improvements therefore creating a net

minimised and remedied	reduction in energy generation.
iii) That the <b>disturbance of landscapes and sites that constitute the nation's cultural heritage</b> is avoided, or where it cannot be altogether avoided, is minimised and remedied	The PoA will have no negative effect on landscapes and sites that constitute the nation's cultural heritage.
iv) That <b>waste is avoided</b> , or where it cannot be altogether avoided, minimised and reused or recycled where possible and otherwise disposed of in a responsible manner	There is minimum waste associated with the PoA, and where possible any waste will be recycled.
v) That the <b>use and exploitation of non-renewable resources is responsible and equitable</b> , and takes into account the consequences of the depletion of the resource	The PoA will have no negative effect on non-renewable resources.
vi) That the <b>development, use and exploitation of renewable resources is responsible and equitable</b> , and takes into account the consequences of the depletion of the resource.	The PoA will have no negative effect on renewable resources.
vii) That a <b>risk averse and cautious approach</b> is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions	The PoA is introducing current, known energy efficiency technologies into operating refrigeration plants, as such it takes into account limits of current knowledge and capacities.
vii) That <b>negative impacts on the environment and on people's environmental rights</b> be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied	The PoA will have no negative effect on the environment and on people's environmental rights. In addition a stakeholder consultation will be undertaken as part of the CDM process, this will provide and opportunity to explore and respond to peoples' potential concerns.
<b>Other comments</b> Please provide any other comments on how this project contributes to sustainable development in South Africa (optional)	

### Indicators in Support of the Project Approval Criteria

	Category	Indicator	Comment
Environmental	Impact on local environmental quality	<ul style="list-style-type: none"> <li>• Impact of the project on air quality</li> <li>• Impact of the project on water pollution</li> <li>• Impact of the project on the generation or disposal of solid waste</li> <li>• Any other positive or negative environmental impacts of the project (such as impacts on noise, safety, visual impacts, or traffic)</li> </ul>	The PoA will improve air quality by introducing energy efficiency technologies that will reduce the need for electricity generation from fossil fuels and therefore reduce levels of air borne pollutants associated with said generation.
	Change in usage of natural resources	<ul style="list-style-type: none"> <li>• Impact of the project on community access to natural resources</li> <li>• Impact of the project on the sustainability of use of water, minerals or other non renewable natural resources</li> <li>• Impact of the project on the efficiency of resource utilisation</li> </ul>	The PoA will introduce energy efficiency technologies that will improve the efficiency of energy utilization.
	Impacts on biodiversity and ecosystems	<ul style="list-style-type: none"> <li>• Changes in local or regional biodiversity arising from the project</li> </ul>	The PoA will have no negative impact on local or regional biodiversity.

### Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment
Economic	Economic impacts	<p>This PoA will contribute significantly to the economic development of the participating countries through encouraging the more efficient use of electricity by large commercial energy consumers who use refrigeration plants. Energy savings at both individual building and national levels make important contributions to the countries' economic efficiency and sustainability, particularly in the context of the rising demand for electricity currently occurring in South Africa.</p> <ul style="list-style-type: none"> <li>• Impact of the project on foreign exchange requirements</li> <li>• Impact of the project on existing economic activity in the area</li> <li>• Impact of the project on the cost of energy</li> <li>• Impact of the project on foreign direct investment</li> </ul>

### Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment
	<p style="text-align: center;">Appropriate technology transfer</p> <ul style="list-style-type: none"> <li>• Positive or negative implications for the transfer of technology to South Africa arising from the project</li> <li>• Impacts of the project on local skills development</li> <li>• Demonstration and replication potential of the project</li> </ul>	<p>The PoA has the ability to create jobs in installation of efficiency technologies and in the provision of monitoring services.</p> <p>The PoA has positive implications for the transfer of technology to South Africa. The PoA will encourage development of a refrigeration efficiency business models that may be new. This allows for the linking of the installation of cutting edge energy efficient products to a range of value added services, including installation, maintenance and convenient financing terms. In addition to the transfer and development of new business models, the PoA will also facilitate the transfer of leading energy efficiency refrigeration technology into South Africa.</p>

## Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment	
Social	Alignment with national provincial and local development priorities	<ul style="list-style-type: none"> <li>• How the project is aligned with provincial and national government objectives</li> <li>• How the project is aligned with local developmental objectives</li> <li>• Impact of the project on the provision of, or access to, basic services to the area</li> <li>• Impact of the project on the relocation of communities if applicable</li> <li>• Contribution of the project to a any specific sectoral objectives (for example, renewable energy targets)</li> </ul>	<p>The PoA supports and enacts the South African Government's 'Energy Efficiency Strategy'. The Strategy sets a target for reduction of electricity consumption in commercial and public buildings of 15% by 2015.</p>
	Social equity and poverty alleviation	<ul style="list-style-type: none"> <li>• Impact of the project on employment levels? (specify the number of jobs created/lost; the duration of time employed, distribution of employment opportunities, types of employment, categories of employment changes in terms of skill levels and gender and racial equity)</li> <li>• Impact of the project on community social structures</li> <li>• Impact of the project on social heritage</li> <li>• Impact of the project on the provision of social amenities to the community in which the project is situated</li> <li>• Contribution of the project to the development of previously underdeveloped areas or specially designated development nodes</li> </ul>	<p>The PoA will create jobs in installation of efficiency technologies and in the provision of monitoring services.</p> <p>CPA 1 is forecast to generate 45 jobs (FTE) in the implementation phase and 5 jobs in the monitoring phase (which will be over the operational life of the CPA, up to 21 years).</p>



### Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment
General	General Project Acceptability <ul style="list-style-type: none"> <li data-bbox="504 527 892 609">• Are the distribution of project benefits deemed to be reasonable and fair?</li> </ul>	The PoA will be accessible to any commercial building owners/operators that plan to improve the efficiency of their refrigeration plants and that are compliant with requirements of the PoA. In this way the benefits of the PoA are deemed to be fair and equitable.

## Part D: Finance

Project Costs	
	Current cost and revenue forecasts for CPA 1 are shown as an illustration of typical financial arrangements for a CPA.
Development Costs (R's )	
Installed Costs (R's)	153,404,692
Other Costs (R's)	57,733,504
Total Project Costs (R's)	211,138,196
Sources of Finance	
Equity	PicknPay - balance of funding after CERs revenues and Eskom grant funding
Debt (long term)	PicknPay is considering a number of debt finance options for a portion of the project cost.
Debt (short term)	PicknPay is considering a number of debt finance options for a portion of the project cost.
Amount not identified (R's)	Further DSM funding from ESKOM may be sought.
Total CDM Contribution sought	26,325,108 R's are forecast from CDM revenues. An ERPA for CPA 1 is currently being finalised.
Expected Price of CER in case of a contract to purchase for: A period of 7 years A period of 10 years	Expected price per is 8 EURO/CER – for first 7 year crediting period

A period of 14 years (2x7 years)	
Indicate the <b>projected Internal Rate of Return</b> for the project with and without CER revenues.	IRR with CER revenues : 14% IRR without CER revenues : 11%
<b>Constraints on tradability of carbon credits</b>	An ERPA for CPA 1 is currently being finalised with Standard Bank. ERPA will cover all CPAs under the PoA.
<b>Preliminary discussions with potential purchasers</b>	An ERPA for CPA 1 is currently being finalised with Standard Bank. ERPA will cover all CPAs under the PoA.