CLEAN DEVELOPMENT MECHANISM
SMALL-SCALE PROGRAMME OF ACTIVITIES DESIGN DOCUMENT FORM
(CDM-SSC-PoA-DD) Version 01

CONTENTS

Annexes

NOTE:

(i) This form is for the submission of a CDM PoA whose CPAs apply a small scale approved methodology.

(ii) At the time of requesting registration this form must be accompanied by a CDM-SSC-CPA-DD form that has been specified for the proposed PoA, as well as by one completed CDM-SSC-CPA-DD (using a real case).

SECTION A. General description of small-scale programme of activities (PoA)

A.1 Title of the small-scale programme of activities (PoA):

Refrigeration Plant Efficiency Programme of Activities

A.2. Description of the small-scale programme of activities (PoA):

1. General operating and implementing framework of PoA

The Coordinating/Managing Entity (Standard Bank Plc) of the Refrigeration Plant Efficiency PoA will provide overall coordination of the Small-Scale Programme of Activities and will facilitate and support project implementers to implement CDM Programme Activities (SSC-CPAs) in South Africa (in the first instance with the intent of expanding the PoA to other Non Annex 1 countries in accordance with EB60/Annex 26).

The Refrigeration Plant Efficiency PoA involves the installation of technologies that improve the energy efficiency of commercial refrigeration plants in a manner compliant with CDM requirements.

The implementation of this SSC-PoA will achieve CO_2 emission reductions by reducing electricity consumption through the facilitation of installation of a range of technologies that will improve the energy efficiency of commercial refrigeration plants.

2. Policy/measure or stated goal of the PoA

The stated goal of the Refrigeration Plant Efficiency PoA is to facilitate the installation of energy efficiency technologies in commercial refrigeration plants.

3. Confirmation that the proposed PoA is a voluntary action by the coordinating/managing entity.

The Refrigeration Plant Efficiency PoA is a voluntary action initiated by the CME. All players under the Refrigeration Plant Efficiency PoA (e.g. CME, project implementers, refrigeration plant owners, etc.) are voluntarily taking part.

A.3. Coordinating/managing entity and participants of SSC-POA:

Name of Party involved (*) ((host) indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Indicate if the Party involved wishes to be considered as CME (Yes/No)	Indicate if the Party involved wishes to be considered as a project participant (Yes/No)
Republic of South Africa	The Standard Bank of South Africa Limited	No	No
United Kingdom of Great Britain and Northern Ireland	Standard Bank Plc	Yes	No

A.4. Technical description of the small-scale programme of activities:

A.4.1. Location of the programme of activities:

The location of the Refrigeration Plant Efficiency PoA is the Republic of South Africa.

The intent is that the boundary of the programme will be amended post-registration to include additional other countries. As per EB60/Annex 26, in expanding the PoA to other countries the following three conditions will be met:

- The existing registered PoA design document (POA-DD) will be revised to reflect the changes, in particular, the eligibility criteria for inclusion of CPAs;
- A designated operation entity (DOE) will confirm that the baseline established in the POA-DD is applicable to the extended programme boundary; and
- The DNA of the new Host Party issues a letter of approval for the programme and a letter of authorization for the co-ordinating and managing entity.

A.4.1.1. Host Party(ies):

The host party for the Refrigeration Plant Efficiency PoA is the Republic of South Africa.

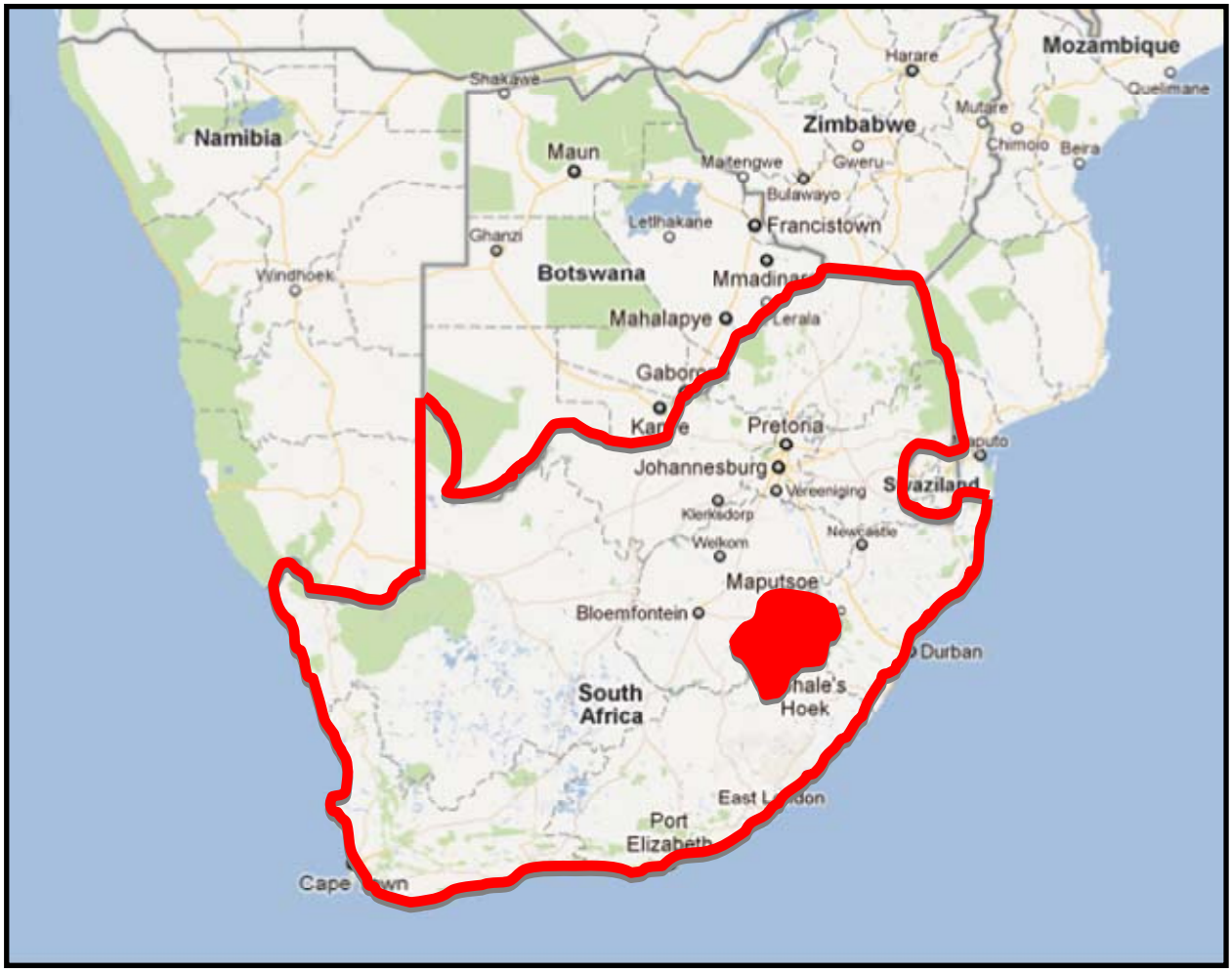
As per section A.4.1, the intent is that additional host parties will be added post-registration.

A.4.1.2. Physical/ Geographical boundary:

The boundary of the Refrigeration Plant Efficiency PoA is defined as the physical, geographical site of the buildings where refrigeration energy efficient technologies are installed. All energy efficient technologies in the CPAs included in the PoA will be installed within the geographic border of the Republic of South Africa. Therefore the boundary of the PoA is defined as the Republic of South Africa. Each CPA-DD will provide specific geographic references of the location of the SSC-CPA.

As per section A.4.1, the intent is that the boundary of the programme will be amended post-registration to include additional countries.

Figure 1: Map of the Republic of South Africa



A.4.2. Description of a typical small-scale CDM programme activity (CPA):

The Refrigeration Plant Efficiency PoA involves the installation of energy efficient technologies that improve the energy efficiency of commercial refrigeration plants. The CDM small-scale methodology AMS II.E/Version 10 shall be applied.

Through the Refrigeration Plant Efficiency PoA a variety of energy efficient refrigeration technologies will be offered to commercial refrigeration plant owners/operators. SSC-CPAs will typically involve the aggregation of a number of technologies and buildings where refrigeration plants operate. The technologies will replace/retrofit existing technology or be installed in new facilities. In general each refrigeration retrofit will involve the following steps:

- A building audit to gathering information on installed equipment, reviewing operating conditions, set-points, confirming required cooling capacity and establishing a general condition of the plant.

- Detailed technical and performance data of the existing plant is accessed and/or gathered. This data is used to determine baseline energy consumption and emissions.
- Determination of appropriate technology substitutions/retrofits in consultation with building owners, occupiers, plant operators, etc.
- Agreement with building owners/occupiers regarding the proposed retrofit and commercial terms (including ownership of CERs generated by the SSC-CPA).
- Technologies procured and installed.
- Ongoing monitoring of the operation of the project refrigeration equipment (as per the monitoring plan detailed in Sections A.4.4.2 and E.7.2) to quantify energy savings and emissions abatement.

Note that this list is not prescriptive and SSC-CPAs may chose to undertake a different series of operational steps as long as it is approved by the coordinating entity and complies with the l requirements of the PoA and the selected methodology.

A.4.2.1. Technology or measures to be employed by the SSC-CPA:

A range of refrigeration plant efficiency technologies will be employed in the SSC-CPAs. In general these technologies are available in South Africa and have been tested and proven internationally, although they have had limited take up due to prevailing practices and barriers (as discussed in A.4.3). The CME will work with parties who have experience in the design, engineering, manufacture and operation of the technologies to be installed under the PoA and with commercial refrigeration plant owners/operators. Examples of technologies to be installed under the PoA include, but are not limited to:

- Plant Controllers - the use of customised integrated plant controllers ensure maximum benefits from the energy saving functions available on the various controllers in the system. The plant controller monitors all the controllers in the field, managing the exchange of information with the objective of achieving the maximum energy saving possible.
- Electronic Expansion Valves (EEVs) - EEVs can be fitted to refrigeration utilities (display cases and cold rooms) for the control of the flow of refrigerant to the evaporator coils so as to optimise operation and efficiency when the outside temperatures are especially favourable (eg. at night and in winter). The use of EEVs also increases the performance of the evaporators in the refrigeration units and greater internal temperature stability; the result is better quality product storage.
- Variable Speed Drives (VSDs) - VSDs modulate the frequency of the power supplied to the electric motors on the condenser fans and rack compressors, reducing peaks in power consumption, and in addition ensures more stable condensing and suction pressures, holding the effective value around the set point without continuous compressor stops and starts.
- Anti-sweat Heater Control - Anti-sweat heater control by dew point can be used where condensate or mist may form on the glass or the frames of refrigeration units. Normally these heaters operate 24 hours a day, but by operating the heaters only at humidity levels in excess of ±55%, climatic conditions may allow modulation or even deactivation. This reduces the compensating load on the plant.
- Automatic Night Blinds - Thermal radiation and convection of warm air into freezer and display fridge cases accounts for most of its refrigeration load. Night blinds can be utilized to cover the front opening of the display case and reduce the heat transfer into the cases,

thereby reducing power use while improving the product temperature maintenance and increasing product shelf live.

- Plant Room Ventilation - Fresh air ventilation can be used during the majority of yearly hours when the ambient air is below 30°C to effectively cool the refrigeration plant room. This eliminates the use of conditioned cool air generated by a cooling plant, using energy that can be more usefully utilized in cooling the store's product.

Each refrigeration plant retrofit will involve the determination of the correct technology mix based on operational requirements. Each SSC-CPA will detail specific technologies to be deployed.

A.4.2.2. Eligibility criteria for inclusion of a SSC-CPA in the PoA:

As per EB 65, Annex 3 - 'Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities (Version 0.10)', the criteria for enrolling a SSC-CPA in the Refrigeration Plant Efficiency PoA are presented below.

No.	Eligibility Criteria
(a)	The geographic boundary of the SSC-CPA, including any time-induced boundary, is unambiguously identified and consistent with the geographic boundary set in the PoA.
(b)	The SSC_CPA meets the following conditions to avoid double counting of emission reductions: – The SSC-CPA is not registered, or being registered, as a stand-alone CDM project outside the Refrigeration Plant Efficiency PoA; – Confirmation from building owners/occupiers participating in the proposed CPA that they are not participating in any existing or proposed CDM project activity outside the Refrigeration Plant Efficiency PoA. – Appropriate legal agreements with the SSC-CPA implementers and the CME have been established to ensure that the ownership and assignment of CERs in respect of the PoA is clear.
(c)	The SSC-CPA involves the installation of energy efficiency technologies in commercial refrigeration plants as per Section A.4.2.1 of the PoA.
(d)	The start date of the SSC-CPA has been checked by the CME through documentary evidence.
(e)	The SSC-CPA follows the baseline and monitoring methodology AMS IIE/Version 10 'Energy efficiency and fuel switching measures for buildings'.
(f)	The SSC-CPA meets the requirements pertaining to the demonstration of additionality as per Sections A.4.3 and E.5 of the PoA.

(g) The SSC-CPA is compliant with requirements of the PoA stipulated by the CME including undertaking an environmental impact analysis.

(h) Affirmation has been provided that funding for the SSC-CPA from Annex I parties, if any, does not result in a diversion of official development assistance.

(i) The SSC-CPA's target group is commercial refrigeration plants inside the PoA boundary.

(j) If the SSC-CPA utilises a representative sampling method as part of its monitoring plan that method is clearly described and compliant with EB 65 'Annex 2 Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities'.

(k) The SSC-CPA in aggregate energy savings meets the small-scale (or if applicable the micro-scale) threshold criteria and remains within those thresholds throughout the crediting period of the SSC-CPA.

(l) The SSC-CPA satisfies the latest version of de-bundling rules for PoAs.

(m) The CME has approved the participation of the SSC-CPA in the PoA.

A.4.3. Description of how the anthropogenic emissions of GHG by sources are reduced by a SSC-CPA below those that would have occurred in the absence of the registered PoA (assessment and demonstration of additionality):

(i) **The proposed PoA is a voluntary coordinated action;**

The Refrigeration Plant Efficiency PoA is a scheme developed by Standard Bank to promote the installation of energy efficiency technologies in commercial refrigeration plants. In South Africa there are no mandatory requirements for commercial refrigeration energy efficiency.

All key players (CME, SSC-CPA project implementers and participating businesses) are voluntarily taking part in the PoA.

(ii) **If the PoA is implementing a voluntary coordinated action, it would not be implemented in the absence of the PoA;**

The Refrigeration Plant Efficiency PoA is implementing a voluntary coordinated action that would not be implemented in the absence of the PoA.

The Refrigeration Plant Efficiency PoA will use a small-scale methodology, and as such, as per EB 65, Annex 3 - 'Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities (Version 0.10)' will assess additionality against one or more of the barriers listed in Attachment A to Appendix B to Annex II of 4/CMP.1. To ensure a well-developed discussion of additionality, the 'Tool for the demonstration and assessment of additionality' (Version 5.2.1) is used, comprising the following steps:

1. Identification of alternative scenarios;
2. Barrier analysis; and
3. Common practice analysis.

Note that the project participants are choosing not to undertake an investment analysis as allowed for under the Tool. As each CPA may deploy different technologies with the aim of improving refrigeration efficiency in a diverse range of environments, it is not feasible to undertake an investment analysis at a PoA level.

Summary

The large-scale adoption of commercial refrigeration plant energy efficiency measures face a number of barriers that the PoA aims to overcome. The analysis set out below establishes that the most likely alternative scenario in the absence of the PoA is the continuation of 'business-as-usual' – that is, the ongoing use of existing refrigeration equipment. The only other alternative scenario considered possible is the autonomous take up of refrigeration efficiency measures by building owners/plant operators. Because of a variety of barriers, discussed in detail below (namely access to finance, prevailing practices, lack of knowledge and split incentives) it is unlikely that building owners/plant operators will adopt refrigeration energy efficiency measures on a scale comparable to that which may be achieved through the establishment of the PoA. The PoA is able to overcome such barriers by creating a consolidated carbon finance platform providing technology, information, services and improving access to capital. In the absence of this PoA, none of the planned and potential CPAs would be implemented due to the barriers summarised above and described in detail below.

The discussion below constitutes the demonstration of additionality for the PoA as a whole. Further discussion of additionality for SSC-CPAs is provided in section E.5.1.

The methodological steps of the 'Tool for the demonstration and assessment of additionality' (Version 5.2.1) are detailed below.

Step 1. Identification of alternative scenarios

Step 1a: Define alternative scenarios to the proposed CDM project activity

Four alternative scenarios to the proposed PoA are considered possible and are presented in Table 1.

Table 1 Alternative scenarios to the proposed CDM project activity

Number & name of scenario	Description
1. Business-as-usual	Continued use of existing commercial refrigeration plant technologies.
2. Autonomous replacement	The proposed activity is undertaken without being registered as a CDM project activity. Under this scenario building owners/plant operators would choose to retrofit their existing refrigeration plant with new energy efficient technologies on a scale comparable to that envisaged by the proposed PoA.
3. Mandatory replacement	The future introduction of laws stipulating the improved energy efficiency of commercial refrigeration plants leading to the large-scale uptake of efficient technologies.
4. Alternative incentives	The introduction of alternative energy saving regulations or policies, such as a demand side management scheme, that create an incentive in the absence of the CDM to improve the energy efficiency of commercial refrigeration plants. Such incentives would need to cause the uptake of energy efficient refrigeration technologies on a scale comparable to that envisaged by the proposed PoA.

Sub-step 1b: Consistency with mandatory laws and regulations:

Table 2 presents an analysis of whether there are identified alternative scenarios that are consistent with current mandatory laws and regulations.

Table 2 Alternative scenarios Consistency with mandatory laws and regulations

Number & name of scenario	Consistent with mandatory laws?	Comment
1. Business-as-usual	Yes	There are no laws or regulations preventing the continued use of inefficient commercial refrigeration plants.
2. Autonomous replacement	Yes	There are no laws preventing the take-up of energy efficient technologies in commercial refrigeration plants.
3. Mandatory replacement	No	This alternative is not applicable because there are currently no mandatory regulations in South Africa requiring that commercial buildings improve the energy efficiency of their refrigeration plants.
4. Alternative incentives	Yes	Whilst in South Africa, the national utility Eskom has set itself targets to reduce energy consumption, and has introduced a number of schemes designed to deliver demand side energy savings[1], there are currently no nationally regulated alternative incentives to the CDM in South Africa to facilitate wide scale adoption of energy efficient commercial refrigeration technologies.

[1] *See: http://www.eskomidm.co.za/industrial/sop and http://www.eskomidm.co.za/www.eskomidm.co.za/esco-model. It should be noted the 'Standard Offer Pilot Programme' is currently in a pilot phase, and has a capped budget allocation for incentive payments of €3.2 million with the goal of realising an estimated energy saving of 88.2 GWh by 2013. The project proponents do not consider this to be material in the context of a national PoA. It should also be noted that the 'ESCO model' is targeted, has barriers to entry and requires ESCOs to bear risk in relation to projected and realised energy savings.*

Based on the above analysis there are two realistic alternative scenarios to the proposed activity:

1. continuation of business-as-usual; or
2. autonomous uptake of more energy efficient commercial refrigeration technologies.

Step 3: Barrier analysis

As is discussed below, because of the prevailing barriers to the uptake of more energy efficient technologies, the project proponents believe that the most likely scenario in the absence of the PoA is the continuation of business-as-usual. In the absence of the PoA, building owners and occupiers would continue to utilise less efficient refrigeration technologies. Well-documented barriers[2] to the uptake of energy efficient technologies: including financial barriers; split incentives; lack of information; and common practice barriers are present in the commercial refrigeration sector in South Africa. Without the proposed CDM PoA there will not be a large scale autonomously generated improvement in the energy efficiency of South Africa's commercial refrigeration sector to the same extent as delivered by the proposed PoA.

Sub-step 3a: Identify barriers that would prevent the implementation of the proposed CDM project activity:

Three main barriers that would prevent the implementation of the proposed CDM project activity are described below, these being:

1. Access to finance
2. Prevailing practice
3. Split-incentives

1. Access-to-finance barriers - *the project activity cannot access appropriate capital without consideration of the CDM revenues.*

Scaling•up investment in energy efficiency is essential to achieving significant reductions in energy related emissions. However, despite energy efficiency's recognised advantages as an investment with immense climate change mitigation benefits, most of energy efficiency opportunities remain unrealised due largely to the significant "investment gap" that exists between the theoretical returns that energy efficiency investments can provide, and the limited capital that is available to make those investments[3].

The International Energy Agency estimates that the building sector is responsible for close to 30% of today's world energy consumption, and is a source of considerable untapped efficiency potential[4]. This efficiency potential should be an attractive investment opportunity, as energy efficiency measures in the buildings sector generally have net•negative cost abatement opportunities. Whilst traditionally low energy prices have been identified as a

[2] *For a summary of these barriers, and their impacts in South Africa see: Energy Efficiency Strategy of the Republic of South Africa, Department of Minerals & Energy, March 2005. Energy Efficiency Strategy of the Republic of South Africa – First Review, Department of Minerals & Energy, October 2008.*

[3] *International Energy Agency, 2010. "Money Matters – Mitigating risk to spark private investment in energy efficiency". Information Paper, Energy Efficiency Series. Paris, September, 2010.*

[4] *See page 524, International Energy Agency (2008), Energy Technology Perspectives. Paris: OECD/IEA. Note that this figure includes all building types: commercial and residential.*

major barrier to stimulating energy efficiency improvements[5], increasing electricity prices in South Africa for commercial building owners and occupiers has the potential to further improve the economics of energy efficiency investments. Prices approved by the National Energy Regulator of South Africa (NERSA) will result in annual increases in the average tariff of approximately 25% between 2010 and 2013[6]. However, it is the higher upfront costs, and additional financing requirements that they bring, that acts as a considerable barrier to the take up of energy efficiency opportunities, including in energy efficient refrigeration technology.

In the context of commercial refrigeration plant energy efficiency, access to finance barriers comes in two interrelated forms, which the PoA will help to overcome:

- A lack of available capital to make required investments in energy efficiency; and
- The perception that energy efficiency investments are 'high-risk' which discourages deployment of available capital.

1.1 Capital Availability

The relatively high up front costs of energy efficient refrigeration technologies presents a significant barrier to building owners and occupiers wishing to improve the efficiency of their refrigeration plants. Undertaking a broad scale/network wide retrofit can represent a considerable up-front investment when compared to the progressive maintenance and replacement of existing refrigeration plants over time. Each SSC-CPA under the PoA will see a number of functional refrigeration plants be replaced or retrofitted with more efficient technologies before the end of their useful lifetimes - avoiding additional electricity consumption and emissions. Without the PoA in place it is less likely that commercial building owners and occupiers will undertake such large scale investments, particularly given that such investment is not targeted at increasing their production or business growth, but rather at reducing costs over time in an area that is unlikely to be core to their day-to-day operations.

The PoA will address access to capital barriers by providing an additional revenue stream from CERs and in some instances an integrated financial solution for the purchase and installation of efficient refrigeration technologies, offering organisations reduced costs and attractive payment terms through the leveraging of carbon revenues.

The use of CERs as collateral to reduce lending risk is an important feature of the PoA that helps to remove the access-to-finance barrier. Whilst Standard Bank and other financial institutions in Africa do currently have products available for energy efficiency equipment procurement, their utilisation is very low or non-existent. Specifically in the case of lending for retrofitting 'minor' energy efficiency technology, this lending is viewed as unsecured due to the fact that a bank will not be take security over energy efficient fittings (and even if it did it would be very difficult to enforce). As such, although banks may offer these products, current utilization is very low, particularly given the lack of security when lending against energy efficiency products. Clearly, without the CDM the provision of financing for energy efficient retrofits is very difficult to access. Even for more credit worthy clients, interest rates for unsecured lending will be higher than secured rates. As such, the securitization of the

[5] *Energy Efficiency Strategy of the Republic of South Africa – First Review, Department of Minerals & Energy, October 2008*

[6] *Source: NERSA Media Statement 24th February 2010 "NERSA's decision on Eskom's required revenue application – multi-year price determination 2010/11 to 2012/13 (MYPD 2)", available at: http://www.nersa.org.za/*

future CER revenue by Standard Bank allows it to improve the terms of financing offered on an unsecured basis, thereby reducing the access to finance barrier.

1.2 Risk Perceptions

Investments in energy efficiency not only face barriers due to a lack of available capital, but also due to the perception that such investments are 'high risk'. International studies[7] show that uncertainty regarding realisable cost savings, and therefore return on investment, is a major reason for companies avoiding investment in energy efficiency. In such cases a commercial refrigeration plant owner and/or operator may have access to finance, but choose not to invest it in energy efficiency retrofits because of concerns that it will not deliver costs savings as promised, or because they choose to invest the money elsewhere. South Africa's National Energy Efficiency Strategy touches on such barriers in its discussion of 'bounded rationality', that is 'the use of imperfect, or incomplete, information and less than fully rational procedures' when it comes to procuring energy efficiency technologies or services. The strategy goes on to state: 'this is significant as the majority of energy consumers currently have imperfect information regarding the range and performance of energy efficient products. This fact inevitably results in poor decision making when purchasing goods or specifying equipment.'[8]

The International Energy Agency identifies two key challenges for energy efficiency investments that the PoA aims to overcome. Firstly, that 'contrary to other investments, energy efficiency cannot be directly measured in terms of incremental physical production. Rather, it is measured as a savings or decrement against a baseline of consumption or expense. The result is perceived complexity, which manifests itself through requirements for monitoring and verification (M&V) to confirm the savings'[9]. Secondly, uncertainty regarding a non-expert's ability to properly implement energy efficient technologies leads potential investors (in this case commercial refrigeration plant owners or operators) to have concerns over the perceived high level of technical and operational risks.

The PoA helps to overcome these information and perception barriers which impede investment in energy efficient refrigeration technologies by providing a consolidated source of information, technology and services, and also by predicating capital investments by owners and/or operators on demonstrated energy savings using an internationally recognised and endorsed M&V protocol. The CDM monitoring and reporting requirements, to which the project proponents themselves are held in order to generate CERs, also serve to provide the certainty of realised energy savings required by investors to deploy capital in energy efficient refrigeration technology for their buildings. Both the financial incentive of CERs, and the United Nations endorsed monitoring framework provided by the CDM are critical to overcoming the perceived risks of investment which are driven by lack of information, both technical (equipment specifications, installation and maintenance requirements etc) and monitoring data (actual energy savings results).

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[7] *See for example, Clinton Climate Initiative, 2009. "An Introduction to Energy Performance Contracting"; International Energy Agency/OECD, 2007. "Mind the Gap: Quantifying Principal-Agent Problems in Energy Efficiency". In support of the G8 Plan of Action. Paris.*

[8] *Energy Efficiency Strategy of the Republic of South Africa, Department of Minerals & Energy, March 2005, page 11-12.*

[9] *International Energy Agency, 2010. "Money Matters – Mitigating risk to spark private investment in energy efficiency". Page 8. Information Paper, Energy Efficiency Series. Paris, September, 2010.*

2. Prevailing Practice & Technology Barriers - *a less technologically advanced alternative to the project activity involves lower risks due to the performance uncertainty or low market share of the new technology adopted for the project activity and so would have led to higher emissions.*

Many of the energy efficient refrigeration technologies offered under the PoA may be relatively new, with a low level of awareness amongst refrigeration plant managers, and even lower levels of operating experience. The innovative nature of some of the refrigeration technologies, combined with their higher cost, as well as the capital intensive nature of a whole-of-network and/or multiple site refrigeration efficiency retrofit, can combine to create strong preferences for continued utilisation of existing systems and technologies. International studies[10] show that uncertainty regarding realisable cost savings, and therefore return on investment, is a major reason for companies avoiding investment in energy efficiency.

Refrigeration plant owners/operators and facility maintenance personnel may have a limited understanding of the benefits of energy savings on lowering whole-of-life operating costs, and as such continue to use existing, less efficient refrigeration technology which is perceived as being cheaper, familiar and lower risk. South Africa's National Energy Efficiency Strategy also describes the 'frequently encountered misconception, particularly within industry, that energy efficiency will disrupt production processes and that changes should not be made unless absolutely necessary.'[11] The challenge of monitoring and quantifying realised cost savings for individual refrigeration plant owners or operators or facilities managers, and the potential risk of poor technology performance mean that the ongoing use of existing refrigeration plant technologies is highly likely.

3. Split Incentives

In addition to refrigeration plant owners and/or operators continuing to utilise existing technologies as a risk mitigation strategy, there is a further barrier to energy efficient refrigeration technologies that is prevalent in the commercial building sector: split incentives.

Split incentives occur when two participants in an economic exchange have different or even competing goals or incentives. In the context of energy efficient commercial refrigeration plant retrofits, such split incentives occur when building owners are required to pay for building equipment upgrades, but it is tenants that are required to pay for electricity bills. In this situation, the entity making the investment (landlord) receives no benefit (energy cost savings), because such benefits accrue to the building occupants (tenants). Tenants are also unlikely to make the investment themselves because they ultimately will not own the equipment installed in the building, and may leave the building before enough energy savings have accrued to pay for the initial investment in efficient refrigeration technologies.

[10] *See for example, Clinton Climate Initiative, 2009. "An Introduction to Energy Performance Contracting"; and International Energy Agency/OECD, 2007. "Mind the Gap: Quantifying Principal-Agent Problems in Energy Efficiency". In support of the G8 Plan of Action. Paris.*

[11] *Energy Efficiency Strategy of the Republic of South Africa, Department of Minerals & Energy, March 2005, page 11*

The PoA can overcome the split incentive barrier by being able to provide economic benefit from the generation of CERs. For example by providing CER revenue to building owners investing in energy efficient refrigeration retrofits, CER revenues provide a monetary 'payback' to building owners who may not necessarily receive the benefit of reduced electricity costs, which are passed through to their tenants.

The aforementioned barriers are critical to demonstrating the additionality of all activities that occur under the PoA. The PoA provides a framework to overcome barriers to the uptake of energy efficient refrigeration retrofits in three main ways:

- Providing a coordinated, well-resourced and incentivized commercial structure to provide information, raise awareness and actively market the large-scale uptake of energy efficient retrofits to commercial refrigeration owners/operators.
- Reduce the upfront cost of efficient commercial refrigeration retrofits through structured carbon finance. By using CER revenues, the project proponents hope to be able to significantly reduce the financial barriers to the uptake of energy efficient technologies.
- Provide a project management and monitoring framework that may facilitate the initial installation of efficient refrigeration technologies as well as the ongoing quantification of energy savings.

By providing up to date information, access to the latest technology, M&V frameworks and innovative finance solutions, the PoA aims to overcome many of the barriers to the uptake of more efficient commercial refrigeration technologies.

Sub-step 3b: Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed project activity):

Based on the analysis and discussion above, the project proponents believe that the barriers will not prevent the business-as-usual scenario from being implemented. The other possible scenario, autonomous uptake (the proposed activity is undertaken without being registered as a CDM project activity), faces all of the aforementioned barriers. As such, it is argued that the baseline scenario in the absence of the PoA would be the continuation of 'business-as-usual'.

Step 4: Common practice analysis

Sub-step 4a: Analyze other activities similar to the proposed project activity:

From discussion and engagement with South African energy efficient experts and industry bodies, the project proponents assert that there are no other operational activities that are similar to the proposed PoA activity (that being an 'at scale/network wide' energy efficiency retrofit of commercial refrigeration). 'Similar projects' has been defined as projects in the same country, which rely on a broadly similar technology and are of a similar scale, Documented evidence of this assertion has been provided to the validating DOE.

More generally however, in South Africa the national utility Eskom are undertaking a series grant based programs aimed at improving the adoption of energy efficient equipment in commercial buildings by providing subsidies, grants and rebates for retrofit projects. Of particular relevance is the 'Standard Offer Pilot Programme' and 'ESCO model' initiatives. Both of these programs involve providing grant-based payments to building owners or project implementers that install energy efficient equipment. These payments are based on the expected peak demand savings delivered by a project.

It should be noted the 'Standard Offer Pilot Programme' is currently in a pilot phase, and has a capped budget allocation for incentive payments of €3.2 million with the goal of realising an estimated energy saving of 88.2 GWh by 2013. The project proponents do not consider this to

be material in the context of a national PoA. It should also be noted that the 'ESCO model' is targeted, has barriers to entry and requires ESCOs to bear risk in relation to projected and realised energy savings.

Sub-step 4b: Discuss any similar Options that are occurring:

As presented in sub-step 4a above, there are no other operational activities that are similar to the proposed PoA activity.

In relation to Eskom programmess, there are essential distinctions between the aforementioned activities by Eskom and the proposed PoA. The Eskom programs are entirely grant based – there is no obligation on project implementers or building owners to repay funding received. Eskom is able to provide such funding because it has regulatory approval from the government's National Energy Regulator of South Africa to recoup its expenditure on demand side management programs through the tariffs paid by all electricity users in South Africa[12]. As such the program proponents have concluded that the proposed PoA has essential differences with the Eskom energy efficiency subsidies and therefore cannot be considered common practice.

Finally, as per the Clarifications on the consideration of national and/or sectoral policies and circumstances in baseline scenarios, Version 2 (EB22 Annex 3), the Eskom incentives can be considered an 'E- sectoral policy' (e.g. public subsidies to promote the diffusion of renewable energy or to finance energy efficiency programs) and as such need not be taken into account in developing a baseline scenario.

Based on the above analysis of alternative scenarios, barriers and common practice, the PoA is considered to be additional.

In addition to the assessment of additionality of the PoA as a whole, individual SSC-CPAs shall consider the *Guidelines for assessing the additionality of micro-scale project activities* (EB 60, Annex 25). Paragraph 3 of the guidelines stipulate:

Energy efficiency project activities that aim to achieve energy savings at a scale of no more than 20 gigawatt hours per year are additional if any one of the conditions below is satisfied:

(a) The geographic location of the project activity is in LDC/SID or special underdeveloped zone of the host country identified by the Government before 28 May 2010;

(b) The project activity is an energy efficiency activity with both conditions (i) and (ii) satisfied;
   (i) Each of the independent subsystems/measures in the project activity achieves an estimated annual energy savings equal to or smaller than 600 megawatt hours; and
   (ii) End users of the subsystems or measures are households/communities/SMEs.

SSC-CPAs will undertake a check to see if they comply with the criteria set out in the guideline. If they meet the criteria as per the guideline they will be deemed to be additional.

(i) **If the PoA is implementing a mandatory policy/regulation, this would/is not enforced;**

The PoA is not implementing a mandatory policy/regulation.

[12] See *page 18: NERSA Issues Paper, "Eskom Revenue Application Multi Year Price Determination 2010/11 to 2012/13 (MYPD 2)." Published 30 October, 2009.*

(ii) **If mandatory a policy/regulation is enforced, the PoA will lead to a greater level of enforcement of the existing mandatory policy/regulation.**

Currently there are no policies/regulations in place in South Africa covering the activity in the SSC-PoA.

The information presented the above section constitutes the demonstration of additionality of the PoA as a whole.

A.4.4. Operational, management and monitoring plan for the programme of activities (PoA):

A.4.4.1. Operational and management plan:

Operational and management arrangements established by the coordinating/managing entity

Standard Bank will coordinate the SSC-PoA as the CME and will support the SSC-CPA project implementers in implementing SSC-CPAs.

The key operational and management arrangements envisaged to carry out the CME role are presented in table 3.

Table 3 Key CME operational activities and management arrangements

Operational activity	Description	Management Arrangements
1. Recruit potential CPA implementers	Seek out and invite potential CPA implementers to develop SSC-CPAs	Provision of requirements of SSC-CPA to potential CPA implementers
2. Contract with CPA implementers	Establish contract with CPA implementers	Commercial contract with CPA implementers
3. SSC-CPA inclusion	Inclusion of SSC-CPA in PoA	Compliance with CDM inclusion process for CPAs
4. CPA implementation & Quality Assurance check	Check of compliance of key aspects of CPA implementation requirements	Compliance check of implementation against requirements in SSC-CPA DD
5. Monitoring and verification activities	Undertake or check of compliance of SSC-CPA monitoring and verification activities as required by the monitoring plan	Monitoring Report to DOE
6. CPA verification and issuance	Management of SSC-CPA verification and issuances process	Compliance with CDM verification process for PoAs
7. Allocation of CERs	Allocation of CERs to parties	Commercial contract with CPA Implementers and other relevant parties

(i) Record keeping system for each CPA under the PoA

Each SSC-CPA will follow the record keeping and monitoring requirements stipulated in AMS II.E/Version 10 and as detailed in Section E.7.2 of this PoA. In summary, the CME will ensure that for each SSC-CPA appropriate records will be kept documenting the following information:

- The geographical location of each SSC-CPA, including the address and client entity responsible for each building involved in retrofit activities.
- The results of baseline audits conducted to determine current refrigeration plant equipment in use in the participating buildings and the energy baseline.
- A record of the product specifications of new energy efficient equipment installed.

- In the case the SSC-CPA involves the replacement of equipment, records of equipment scrapping procedures, including reports provided by independent verifier involved in cross-checking baseline equipment destruction will be kept.
- Monitoring data collected from the SSC-CPA monitoring plan.

The CME will be responsible for the management of records and data associated with each SSC-CPA. Data will be stored in secure project databases for the duration of each SSC-CPA crediting period, plus two years. The information stored in the databases will be used as the basis of the production of monitoring reports used to quantify emission reductions and claim CERs.

(ii) System/procedure to avoid double accounting e.g. to avoid the case of including a new CPA that has been already registered either as a CDM project activity or as a CPA of another PoA

The CME will implement a system to avoid double counting of emission reductions. This system will avoid the situation where a new SSC-CPA that has been already registered either as a CDM project activity, or as a CPA of another PoA, is included under the PoA.

Prior to registering a new SSC-CPA within the proposed PoA, the CME will check the CDM project database to establish whether a CDM project activity or CPA of another PoA utilising energy efficient refrigeration has already been registered involving the same buildings. Given that each SSC-CPA included in the PoA will be identified by geographical location of buildings where retrofits occur (e.g. address, GPS location data and building name), it is possible to unambiguously identify CPAs or CDM project activities potentially operating in the same area. In addition, the CME will confirm with building owners and occupiers participating in the proposed SSC-CPA that they are not participating in any existing or proposed CDM project activity. If the CME identifies that there is an existing or proposed CDM activity involving the buildings targeted by the SSC-CPA, then those buildings will be excluded from participating in the PoA.

In addition, the CME will ensure that all parties involved in the implementation of a SSC-CPA have agreed to assign CERs to this PoA. This will avoid the situation whereby technology suppliers or installers involved in SSC-CPA implementation claim the same emission reductions as CERs for another CDM project or PoA. The CME will establish appropriate legal agreements with the SSC-CPA implementers to ensure that the ownership and assignment of CERs in respect of the PoA is clear, and avoids the possibility of emission reductions being double counted.

(iii) The SSC-CPA included in the PoA is not a de-bundled component of another CDM programme activity (CPA) or CDM project activity

As per the latest version of the 'Guidance for determining of debundling under a Programme of Activities' (V.3 EB 54), if each of the independent subsystems/measures included in the CPA of a PoA is no larger than 1% of the small-scale thresholds defined by the methodology applied (in this case 60GWh per year), then that SSC-CPA of PoA is exempted from performing de-bundling check (i.e. considered as not being a de-bundled component of a large scale activity).

The CME will ensure that SCC-CPA independent measures included in the CPA are less than 0.6 GWh/per annum.
As an illustration of debundling compliance of a typical SSC-CPA, in SSC-CPA 1 the projected aggregate average annual energy savings from one site where 6 technologies/measures are to be deployed is 0.44 GWh. As can be seen from this estimate, at a subsystem level and at an

aggregate (all 6 technologies/sub-systems) level the measures included generate annual savings less than 1% (0.6 GWh) of the small-scale threshold.

(iv) The provisions to ensure that those operating the CPA are aware of and have agreed that their activity is being subscribed to the PoA

The CME is responsible for inclusion of all SSC-CPAs to be included in the proposed PoA. This will mean that those operating the SSC-CPA will be aware and will have agreed that their activity is subscribed to the proposed PoA. Legal agreements will be put in place with participating partners clearly stipulating that their activities are subscribed to the PoA.

A.4.4.2. Monitoring plan:

(i) Description of the proposed statistically sound sampling method/procedure to be used by DOEs for verification of the amount of reductions of anthropogenic emissions by sources or removals by sinks of greenhouse gases achieved by CPAs under the PoA

As per paragraph 2, 8 and 9 of the applied approved methodology (AMS II.E/Version 10) monitoring includes:

- direct measurement and recording of energy use within the project boundary;
- in the case of retrofit measures - documenting the specification of equipment replaced and calculating the energy savings due to the measures installed;
- in the case of a new facility - metering the energy use of the building(s) and calculating the energy savings of the new building; and
- where the SCC-CPA involves the replacement of the equipment, an independent monitoring of scrapping of replaced equipment is required.

Each SSC-CPA will have a detailed monitoring plan describing how they comply with monitoring requirements of the applied approved methodology (AMS II.E/Version 10) and this PoA. SSC-CPA monitoring plans will clearly describe the approach and technologies to be used to collect the following parameters *inter-alia*:

- baseline energy consumption;
- average annual quantity of refrigerant used in the baseline to replace refrigerant that has leaked (in the case where SSC-CPA technologies impact on the quantity of refrigerant used, refer Section E);
- direct measurement and recording of energy use in within the project boundary;
- project emissions from physical leakage of refrigerant from the project equipment (in the case where SSC-CPA technologies impact on the quantity of refrigerant used, refer Section E); and
- where the SCC-CPA involves the replacement of equipment, the process and documentation for an independent monitoring of scrapping of replaced equipment.

Where a SSC-CPA intends to use a representative sampling method this method must be clearly described and compliant with EB 65 'Annex 2 Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities'.

(ii) In case the coordinating/managing entity opts for a verification method that does not use sampling but verifies each CPA (whether in groups or not, with different or identical verification periods) a transparent system is to be defined and described that ensures that no double accounting occurs and that the status of verification can be determined anytime for each CPA

To ensure that no double accounting occurs and that the status of verification can be determined for each CPA the CME will establish a project database that will contain the following data. The data will be directly attributable to each SSC-CPA allowing unambiguous identification of emission reductions attribute to each SSC-CPA:

- Start and end dates of each monitoring period.
- List of physical geographic location of each measure installed.
- Number of pieces of equipment distributed.
- Date of supply.
- Specification of equipment replaced.
- Data on key parameters: baseline energy consumption; average annual quantity of refrigerant used in the baseline (refer Section E); project activity energy use; and project emissions from physical leakage of refrigerant from the project equipment (refer Section E);
- Unambiguous identification of the recipient of the equipment.
- Emission reductions attributable for each monitoring period.

The CME will produce a monitoring report for each SSC-CPA, or cluster of SSC-CPAs (see below) for verification for each monitoring period. This report will transparently and unambiguously set out the relevant required data relating to the Emission Reductions generated by that CPA(s) during the monitoring period.

Appropriate data control procedures will be in place to ensure integrity and accuracy of the data in the project database.

Where SSC-CPA's project activities can be demonstrated to be homogenous (e.g. multiple CPAs in one geographic area and/or using similar technologies) SSC-CPAs may be clustered together and one representative monitoring report conducted to satisfy monitoring requirements across like SSC-CPAs.

A.4.5. Public funding of the programme of activities (PoA):

If Public Funding is accessed for any SSC-CPAs under this PoA, affirmation will be provided in the SSC-CPA DD from the CPA implementer that this funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligation of those parties.

SECTION B. Duration of the programme of activities (PoA)

B.1. Starting date of the programme of activities (PoA):

The latter of October 2011 or commencement of global stakeholder consultation process (i.e. uploading of design documents onto UNFCCC website).

B.2. Length of the programme of activities (PoA):

28 years

SECTION C. Environmental Analysis

C.1. Please indicate the level at which environmental analysis as per requirements of the CDM modalities and procedures is undertaken. Justify the choice of level at which the environmental analysis is undertaken:

1. Environmental Analysis is done at PoA level ☐
2. Environmental Analysis is done at SSC-CPA level ☒

C.2. Documentation on the analysis of the environmental impacts, including transboundary impacts:

Done at a SSC-CPA level.

C.3. Please state whether in accordance with the host Party laws/regulations, an environmental impact assessment is required for a typical CPA, included in the programme of activities (PoA),:

At the time of PoA submission South Africa do not require an environmental impact statement for a typical CPA.

SECTION D. Stakeholders' comments

D.1. Please indicate the level at which local stakeholder comments are invited. Justify the choice:

1. Local stakeholder consultation is done at PoA level ☒
2. Local stakeholder consultation is done at SSC-CPA level ☐

Note: If local stakeholder comments are invited at the PoA level, include information on how comments by local stakeholders were invited, a summary of the comments received and how due account was taken of any comments received, as applicable.

D.2. Brief description how comments by local stakeholders have been invited and compiled:

A public participation meeting was organised for 4th October 2011 at the Sandton Sun Hotel in Sandton, South Africa.

The public participation meeting was advertised in the Sunday Times (a South African national Sunday newspaper) on 18th September 2011.

In addition to the advert in a national newspaper personal invitations were sent by e-mail to relevant stakeholder organisations.

In the advert and the personal invitations interested parties who were not able to attend were invited to submit comments and queries by e-mail, telephone or post by 11 October 2011.

The public participation meeting consisted of two sessions (held at 2pm and 5pm on the 4th October 2011). 6 people attended the first session and 2 people attended the second. In each session a presentation was made describing the project followed by a question and answer session in which attendees were invited to make comments and ask questions. Attendees were asked to leave their contact details. A list of attendees, copies of invitations and advertising materials have been provided to the DOE for validation.

D.3. Summary of the comments received:

A summary of questions and comments made and responses given are shown in Table 4.

Table 4 summary of Stakeholder Feedback

Question No	Question/comment	Answer/response
Session 1		
1	Has Standard Bank worked out a payback period that includes the cost of the M&V?	The payback period will depend on the technology and the energy savings.
2	How would a supplier/distributor gain from this programme?	A supplier or distributor could either (a) get a cession of the carbon rights from the end user. Standard bank then enters into a bilateral arrangement with the supplier or distributor who passes on the benefit to the end user; or (b) promote the programme to the end users as a way to reduce the all in cost of the intervention to a point where it is viable.
3	If one has energy saving equipment how would they market the programme?	As above either by using CER revenue to reduce purchase price to end-user or by sharing the CER revenue with the end user on an ongoing basis.
4	Can this programme work if you sell equipment to someone who sells it to the public?	Yes, programmes of activity are designed for mass rollouts. The end user can cede the carbon rights to the seller as part of the sale process and the seller can pass on the benefit of the carbon rights through a lower sale price.
Session 2		
5	Is there a guideline on how long you need to monitor for?	Monitoring needs to continue for as long as the CERs are claimed and this can be either 10 years or 7 years, 3 times renewable.
6	What are the costs of monitoring?	It will depend on the terms of the approved monitoring plan.
7	Is there an entry level size of project for the programme?	The upper CPA limit is 60GWH and we are investigating aggregating projects to keep per CPA costs down
8	Is the baseline for energy savings the same for the 10 year project period?	Yes, during the period of operation of the CPA the energy savings are always measured against the same baseline.

Question No	Question/comment	Answer/response
9	Is the monitoring required for Eskom demand side management programmes and the monitoring required for the programme aligned?	We are working with M&V consultants who also do work for Eskom to ensure minimal duplication but monitoring for CDM is generally more rigorous than for Eskom demand side management programmes and monitoring period is longer.
10	What are the next steps?	Once we are in validation we can start engaging with project participants and collecting data on the projects and evaluating their potential inclusion.
11	Is this programme mainly retrofit?	Yes
12	What about new projects?	The PoA allows for inclusion of projects in new facilities.
13	What is the geographic extent of this programme?	Currently the geographic extent is South Africa but the intent is to expand it to other countries later.

D.4. Report on how due account was taken of any comments received:

The section below provides an overview of how stakeholder feedback will be incorporated into the design of the PoA.

The sessions provided some insights and ideas into operational elements of the PoA, which will be used by the project implementer to assist with the design and implementation of the PoA.

The majority of questions were regarding requirements for operationalising the PoA, value of participation and marketing to interested parties. As such, marketing materials will be developed to assist stakeholders gain an understanding of the PoA, its value, eligibility criteria and participation processes.

Question 9 relates to alignment of ESKOM demand side management monitoring and verification requirements and monitoring plan for the PoA. The CME will work with monitoring and verification consultants who also do work for Eskom, to ensure minimal duplication and maximise alignment with ESKOM monitoring and verification requirements where possible.

SECTION E. Application of a baseline and monitoring methodology

This section shall demonstrate the application of the baseline and monitoring methodology to a typical SSC-CPA. The information defines the PoA specific elements that shall be included in preparing the PoA specific form used to define and include a SSC-CPA in this PoA (PoA specific CDM-SSC-CPA-DD).

E.1. Title and reference of the approved SSC baseline and monitoring methodology applied to a SSC-CPA included in the PoA:

The approved SSC baseline and monitoring methodology to be applied to a SSC-CPA included in this PoA is AMS II.E./Version 10. Note that the Executive Board has approved this methodology for use in PoAs.

E.2. Justification of the choice of the methodology and why it is applicable to a SSC-CPA:

AMS II.E/Version 10

AMS II.E/Version 10 is applicable to a SSC-CPA since a SSC-CPA meets all the requirements set out in the methodology, these being:

- SSC-CPA comprise energy efficiency measures implemented at a single building or group of similar buildings;
- SSC-CPA comprise project activities aimed at energy efficiency;
- Technologies used will replace/retrofit existing equipment or be installed in new facilities;
- The aggregate energy savings of a single SSC-CPA will not exceed the equivalent of 60 GWh per year;
- SSC-CPA's will directly record the energy use within the project boundary;
- SSC-CPA measurement of improvement in energy efficiency can be clearly distinguished from changes in energy use due to other variables;
- In the case of replacement measures – the SSC-CPA will document the specification of equipment replaced; and calculate the energy savings due to the measures installed;
- In the case of a new facility – the SSC-CPA will meter energy use of the building(s); and calculate the energy savings of the new building; and
- Where the SCC-CPA involves the replacement of the equipment, an independent monitoring of scrapping of replaced equipment will be undertaken.

Applicability of Tool for the demonstration and assessment of additionality – Version 05.2

Paragraphs 5 and 6 of the Tool state:
"This document provides for a step-wise approach to demonstrate and assess additionality. These Steps include:

- Identification of alternatives to the project activity;
- Investment analysis to determine that the proposed project activity is either: 1) not the most economically or financially attractive, or 2) not economically or financially feasible;
- Barriers analysis; and
- Common practice analysis.

The document provides a general framework for demonstrating and assessing additionality and is applicable to a wide range of project types."

The project proponents consider that the Tool is relevant and applicable for use with the proposed project type, and have followed the steps set out in the Tool. The Tool is deemed to be applicable in the context of the proposed PoA.

Applicability of the Tool to calculate the emissions factor for an electricity system – Version 2.2.1

The Tool states:

"This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity, i.e. where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects)."

The project proponents have used the Tool to calculate the OM, BM and CM for the national grids covered by SSC-CPAs under the PoA. The Tool is deemed to be applicable as the CPAs under the PoA result in savings of electricity that would have been provided by the grid.

E.3. Description of the sources and gases included in the SSC-CPA boundary

The SSC-CPA boundary is the physical, geographic site of the building(s) where refrigeration energy efficient technologies are installed.

The installation of refrigeration efficiency technologies installation will reduce the need for electricity. The electricity supplied by the grid in the participating countries is, in part, fossil fuel based. Therefore, in-directly GHG emissions from the grid-connected power plants are reduced. Table 5 below describes gases to be included in the SSC-CPA boundary.

Table 5 Gases to be included in the SSC-CPA boundary

	Source	Gas	Included?	Justification
Baseline	Power plants servicing the grid	CO_2	Yes	Main emission source
		CH_4	No	Emission source small – excluded for simplification
		N_20	No	Emission source small – excluded for simplification
Project Activity	Power plants servicing the grid	CO_2	Yes	Main emission source
		CH_4	No	Emission source small – excluded for simplification
		N_20	No	Emission source small – excluded for simplification

E.4. Description of how the baseline scenario is identified and description of the identified baseline scenario:

Section A.4.3 above provides an extensive discussion of potential alternative scenarios. The project proponents have argued that the most likely scenario in the absence of the PoA is the continuation of 'business-as-usual'. Under this scenario commercial refrigeration plant building owners/operators continue to utilise existing, lower efficiency plant.

As per paragraph 5 and 6 of the applied approved methodology (AMS. II.E./Version 10) the baseline emissions of each SSC-CPA consists of the energy baseline multiplied by an emission coefficient.

The energy baseline is the energy use of the existing equipment that is replaced/retro-fitted in the case of retrofits measures and of the facility that would otherwise be built in the case of a new facility.

The emission coefficient will be calculated applying the latest version of AMS I D.

The baseline emissions of each SSC-CPA will be measured by gathering data during the baseline audit of each refrigeration plant. SSC-CPAs will describe methodology and present appropriate data in the calculation of their baseline emissions.

To take into consideration the guidance set out in EB34, paragraph 17, an assessment will be made of the risk of the SSC-CPA resulting in an increase of physical leakage emissions due to refrigerant uses. The nature and demonstration of such assessment will be defined at the SSC-CPA level.

If, according to the above mentioned assessment, the SSC-CPA is likely to result in an increase of physical leakage emissions due to refrigerant uses, the SSC-CPA will use the approach outlined in 1a (below) to calculate the baseline emissions.

If, according to the above mentioned assessment, the SSC-CPA will not result in an increase of physical leakage emissions due to refrigerant uses, the SSC-CPA can use the approach outlined in 1b (below) to calculate the baseline emissions.

$$BE_y = E_{BL,y} * EF_{CO2,\ ELEC,y} + Q_{ref,BL} * GWP_{ref,\ bl} \quad (1a)$$

Where:

BE_y	Baseline emissions in monitoring period y (tCO_2e)
$E_{BL,y}$	Energy consumption in the baseline in monitoring period y (kWh)
$EF_{CO2,\ ELEC,y}$	Emission factor in monitoring period y calculated in accordance with the provisions in AMS I.D (tCO_2/MWh)
$Q_{ref,BL}$	Average annual quantity of refrigerant used in the baseline to replace the refrigerant that has leaked (tonnes/year). Values from Chapter 7: Emissions of fluorinated substitutes for Ozone depleting substances, Volume 3, Industrial Processes and Product Use, 2006 IPCC Guidelines for National Greenhouse Gas Inventories may be used
$GWP_{ref,\ bl}$	Global Warming Potential of the baseline refrigerant (t CO2e/t refrigerant)

$$BE_y = E_{BL,y} * EF_{CO2,\ ELEC,y} \quad (1b)$$

Where:

BE_y	Baseline emissions in monitoring period y (tCO_2e)
$E_{BL,y}$	Energy consumption in the baseline in monitoring period y (kWh)
$EF_{CO2,\ ELEC,y}$	Emission factor in monitoring period y calculated in accordance with the provisions in AMS I.D (tCO_2/MWh)

E.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the SSC-CPA being included as registered PoA (assessment and demonstration of additionality of SSC-CPA): >>

E.5.1. Assessment and demonstration of additionality for a typical SSC-CPA:

Section A.4.3 provides extensive discussion of the additionality of the PoA, in particular the barriers that prevent the adoption of new energy efficiency commercial refrigeration technologies. It is expected that individual SSC-CPAs will face similar barriers to those impacting on the PoA as a whole. To demonstrate the additionality of a typical SSC-CPA, the SSC-CPA implementer will provide a discussion of one or more of the barriers listed in A.4.3, as per the guidance provided in the "Non-binding best practice examples to demonstrate additionality for SSC project activities" in Annex 34, EB35. SSC-CPAs able to demonstrate the presence of one or more barriers will be deemed additional.

In addition SSC-CPAs may choose to identify and discuss other barriers (such as institutional, information, managerial resources, organisational capacity, etc) in order to demonstrate the additionality of the project activity.

E.5.2. Key criteria and data for assessing additionality of a SSC-CPA:

The key criteria for assessing additionality of a SSC-CPA is the ability to demonstrate that one or more of the barriers described in Section E.5.1, or other applicable barrier, exists and would prevent the proposed project activity from being implemented without the CDM.

E.6. Estimation of Emission reductions of a CPA:

E.6.1. Explanation of methodological choices, provided in the approved baseline and monitoring methodology applied, selected for a typical SSC-CPA:

The 2 methodological choices provided for in AMS II.E/.Version 10 which will be applied in relation to each of the SSC-CPAs to be developed under this PoA are:

- Leakage; and
- Project activity under a programme of activities

If the energy efficiency technology in a SSC-CPA is equipment transferred from another activity or if the existing equipment is transferred to another activity, leakage will be considered.

If the SSC-CPA involves the replacement of equipment, and the leakage effect of the use of the replaced equipment in another activity is negated because the replaced equipment is scrapped, an independent monitoring of scrapping of replaced equipment will be implemented. The monitoring will include a check if the number of project activity equipment distributed by the project and the number of scrapped equipment correspond with each other. For this purpose scrapped equipment will be stored until such correspondence has been checked. The scrapping of replaced equipment will be documented and independently verified.

E.6.2. Equations, including fixed parametric values, to be used for calculation of emission reductions of a SSC-CPA:

SSC-CPA's will use the following approach to calculate emission reductions:

$$PE_y = EP_{pJ,y} * EF_{CO2y,} / (1- I_y) \quad (2)$$

Where:

PE_y	Project emissions in year *y* (t CO2e)
$EP_{pJ,y}$	Energy consumption in project activity in year *y.* This shall be determined *ex post* based on monitored values (kWh)
EF_{CO2y}	Emission factor in monitoring period y calculated in accordance with the provisions in AMS I.D (tCO_2/MWh)
I_y	Average annual technical grid losses (transmission and distribution) during year y for the grid serving the locations where the devices are installed, expressed as a fraction. This value shall not include non-technical losses such as commercial losses (e.g., theft/pilferage). The average annual technical grid losses shall be determined using recent, accurate and reliable data available for the host country. This value can be determined from recent data published either by a national utility or an official governmental body. Reliability of the data used (e.g., appropriateness, accuracy/uncertainty, especially exclusion of non technical grid losses) shall be established and documented in the SSC-CPA DD. A default value of 0.1 shall be used for average annual technical grid losses, if no recent data are available or the data cannot be regarded accurate and reliable (Number – fraction)

As described in Section E.4, if according to the assessment, the SSC-CPA is likely to result in an increase of physical leakage emissions due to refrigerant uses, the SSC-CPA will use the approach outlined in equation 3 (below) to calculate leakage emissions.

$$LE_y = Q_{ref,PJ,y} * GWP_{ref,P,J} \quad (3)$$

Where:

LE_y	Leakage emissions in year y (tCO_2e)
$Q_{ref,PJ,}$	Average annual quantity of refrigerant used in year y to replace refrigerant that has leaked in year y (tonnes/year). Values from Chapter 7: Emissions of fluorinated substitutes for Ozone depleting substances, Volume 3, Industrial Processes and Product Use, 2006 IPCC Guidelines for National Greenhouse Gas Inventories may be used (tonnes/year)
$GWP_{ref,P,J}$	Global Warming Potential of the refrigerant that is used in the project equipment (t CO2e/t refrigerant).

As described in Section E.4, if according to the assessment, the SSC-CPA is likely to result in an increase of physical leakage emissions due to refrigerant uses, the SSC-CPA will use the approach outlined in equation 4a (below) to calculate emission reductions.

As also described in Section E.4, if according to the assessment, the SSC-CPA is likely not to result in an increase of physical leakage emissions due to refrigerant uses, the SSC-CPA will use the approach outlined in equation 4b (below) to calculate emission reductions.

$$ER_y = (BE_y - PE_y) - LE_y \quad (4a)$$

Where:

ER_y	Emission reduction in year y (tCO_2e)
BE_y	Baseline emissions in monitoring period y (tCO_2e) as per equation (1) section E.4
PE_y	Project emissions in year y (tCO_2e)
LE_y	Leakage emissions in year y (tCO_2e)

$$ER_y = BE_y - PE_y \quad (4b)$$

Where:

ER_y	Emission reduction in year y (tCO_2e)
BE_y	Baseline emissions in monitoring period y (tCO_2e) as per equation (1) section E.4
PE_y	Project emissions in year y (tCO_2e)

E.6.3. Data and parameters that are to be reported in CDM-SSC-CPA-DD form:

Data / Parameter:	BE_y
Data unit:	tCO_2e
Description:	Baseline emissions in monitoring period y
Source of data used:	Inputs to equation (1) in Section 4
Value applied:	Result of calculation using equation (1) in Section 4
Justification of the choice of data or description of measurement methods and procedures actually applied :	Compliant with approved CDM methodology
Any comment:	

Data / Parameter:	$E_{BL,y}$
Data unit:	kWh
Description:	Energy consumption in the baseline in monitoring period y
Source of data used:	SSC-CPA baseline energy audit
Value applied:	Result of SSC-CPA baseline energy audit
Justification of the choice of data or description of measurement methods and procedures actually applied :	Compliant with approved methodology to be applied (AMS.II.E/Version 10). The baseline emissions of each SSC-CPA will be measured by gathering data during the baseline audit of each refrigeration plant. SSC-CPAs will describe methodology and present appropriate data in the calculation of their baseline emissions.
Any comment:	

Data / Parameter:	$EF_{CO2,ELEC,y}$
Data unit:	tCO_2/MWh
Description:	Emission factor in monitoring period y
Source of data used:	Emission factor calculation in SSC-CPA, which is calculated in accordance with AMS-I.D. Calculations will be based on data from an official source (where available) and made publicly available.
Value applied:	Result from Emission factor calculation in SSC-CPA
Justification of the choice of data or description of measurement methods and procedures actually applied :	Stipulated in accordance with the provisions in AMS-I.D
Any comment:	

Data / Parameter:	$Q_{ref,BL}$
Data unit:	Tonnes
Description:	Average annual quantity of refrigerant used in the baseline to replace the refrigerant that has leaked
Source of data used:	SSC-CPA baseline audit
Value applied:	Result of SSC-CPA baseline audit
Justification of the choice of data or description of measurement methods and procedures actually applied :	Compliant with approved CDM methodology. The baseline emissions of each SSC-CPA will be measured by gathering data during the baseline audit of each refrigeration plant. SSC-CPAs will describe methodology and present appropriate data in the calculation of their baseline emissions.
Any comment:	Values from Chapter 7: Emissions of fluorinated substitutes for Ozone depleting substances, Volume 3, Industrial Processes and Product Use, 2006 IPCC Guidelines for National Greenhouse Gas Inventories may be used. As described in Section E.4, this parameter only applies when if according to the assessment, the SSC-CPA is likely to result in an increase of physical leakage emissions due to refrigerant uses.

Data / Parameter:	$GWP_{ref,\ bl}$
Data unit:	t CO2e/t refrigerant
Description:	Global Warming Potential of the baseline refrigerant
Source of data used:	Values from EB 34 paragraph 17
Value applied:	Result of SSC-CPA baseline audit and application of values from EB 34 paragraph 17
Justification of the choice of data or description of measurement methods and procedures actually applied :	Compliant with approved CDM methodology. The baseline emissions of each SSC-CPA will be measured by gathering data during the baseline audit of each refrigeration plant. SSC-CPAs will describe methodology and present appropriate data in the calculation of their baseline emissions.
Any comment:	As described in Section E.4, this parameter only applies when if according to the assessment, the SSC-CPA is likely to result in an increase of physical leakage emissions due to refrigerant uses.

Data / Parameter:	$EP_{pJ,y}$
Data unit:	kWh
Description:	Energy consumption in project activity in year *y*
Source of data used:	Monitored values as per metering solutions described in SSC-CPAs
Value applied:	Determined *ex post* based on monitored values in SSC-CPAs
Justification of the choice of data or description of measurement methods and procedures actually applied :	Compliant with approved CDM methodology. The SSC-CPA will detail monitoring technologies and approaches.
Any comment:	

Data / Parameter:	EF_{CO2y}
Data unit:	tCO_2/MWh
Description:	Emission factor in monitoring period y
Source of data used:	Emission factor calculation in SSC-CPA, which is calculated in accordance with AMS-I.D. Calculations will be based on data from an official source (where available) and made publicly available.
Value applied:	Result Emission factor calculation in SSC-CPA
Justification of the choice of data or description of measurement methods and procedures actually applied :	Stipulated in accordance with the provisions in AMS-I.D
Any comment:	

Data / Parameter:	I_y
Data unit:	Number (fraction)
Description:	Average annual technical grid losses (transmission and distribution) during year y for the grid serving the locations where the devices are installed.
Source of data used:	The average annual technical grid losses shall be determined using recent, accurate and reliable data available for the host country. This value can be determined from recent data published either by a national utility or an official governmental body. Reliability of the data used shall be established and documented in the SSC-CPA.
Value applied:	Average annual technical grid losses reported in SSC-CPA. A default value of 0.1 shall be used for average annual technical grid losses, if no recent data are available or the data cannot be regarded accurate and reliable.
Justification of the choice of data or description of measurement methods and procedures applied	Complaint with approved CDM methodologies
Any comment:	This value shall not include non-technical losses such as commercial losses (e.g., theft/pilferage). A default value of 0.1 shall be used for average annual technical grid losses, if no recent data are available or the data cannot be regarded accurate and reliable.

Data / Parameter:	$Q_{ref,PJ}$
Data unit:	Tonnes
Description:	Average annual quantity of refrigerant used in year y to replace refrigerant that has leaked in year y
Source of data used:	SSC-CPA record keeping system
Value applied:	Result from SSC-CPA record keeping system
Justification of the choice of data or description of measurement methods and procedures applied	Compliant with approved CDM methodology
Any comment:	Values from Chapter 7: Emissions of fluorinated substitutes for Ozone depleting substances, Volume 3, Industrial Processes and Product Use, 2006 IPCC Guidelines for National Greenhouse Gas Inventories may be used. As described in Section E.4, this parameter only applies when if according to the assessment, the SSC-CPA is likely to result in an increase of physical leakage emissions due to refrigerant uses.

Data / Parameter:	$GWP_{ref,P,J}$
Data unit:	t CO2e/t refrigerant
Description:	Global Warming Potential of the refrigerant that is used in the project equipment
Source of data used:	Values from EB 34 paragraph 17
Value applied:	Application of values from EB 34 paragraph 17
Justification of the choice of data or description of measurement methods and procedures actually applied :	Compliant with approved CDM methodology
Any comment:	Values from Chapter 7: Emissions of fluorinated substitutes for Ozone depleting substances, Volume 3, Industrial Processes and Product Use, 2006 IPCC Guidelines for National Greenhouse Gas Inventories may be used. As described in Section E.4, this parameter only applies when if according to the assessment, the SSC-CPA is likely to result in an increase of physical leakage emissions due to refrigerant uses.

Data / Parameter:	ER_y
Data unit:	tCO_2e
Description:	Emission reduction in year *y*
Source of data used:	Inputs to equation (4) in Section E.6.2
Value applied:	Result of calculation using equation (4) in Section E.6.2
Justification of the choice of data or description of measurement methods and procedures actually applied :	Compliant with approved CDM methodology
Any comment:	

Data / Parameter:	PE_y
Data unit:	tCO_2e
Description:	Project emissions in year *y*
Source of data used:	Inputs to equation (2) in Section E.6.2
Value applied:	Result of calculation using equation (2) in Section E.6.2
Justification of the choice of data or description of measurement methods and procedures actually applied :	Compliant with approved CDM methodology
Any comment:	

Data / Parameter:	LE_y
Data unit:	tCO_2e
Description:	Leakage emissions in year y
Source of data used:	Inputs to equation (3) in Section E.6.2
Value applied:	Result of calculation using equation (3) in Section E.6.2
Justification of the choice of data or description of measurement methods and procedures actually applied :	Compliant with approved CDM methodology
Any comment:	As described in Section E.4, this parameter only applies when if according to the assessment, the SSC-CPA is likely to result in an increase of physical leakage emissions due to refrigerant uses.

E.7. Application of the monitoring methodology and description of the monitoring plan:

D.7.1. Data and parameters to be monitored by each SSC-CPA:

Data / Parameter:	$EP_{pJ,y}$
Data unit:	kWh
Description:	Energy consumption in project activity in year *y*
Source of data to be used:	Monitored data stored in SSC-CPA record keeping system
Value of data applied for the purpose of calculating expected emission reductions in section B.5	SSC- CPA specific
Description of measurement methods and procedures to be applied:	Metering equipment that will directly measure energy use. Metering equipment descriptions and processes will be detailed in each SSC-CPA
QA/QC procedures to be applied:	Metering equipment will be spot checked to ensure ongoing functionality and accuracy. QA procedures will be detailed in each SSC- CPA DD
Any comment:	

Data / Parameter:	$Q_{ref,PJ}$
Data unit:	Tonnes
Description:	Average annual quantity of refrigerant used in year y to replace refrigerant that has leaked in year y
Source of data to be used:	Monitored data stored in SSC-CPA record keeping system
Value of data applied for the purpose of calculating expected emission reductions in section B.5	SSC- CPA specific
Description of measurement methods and procedures to be applied:	Measurement methods will be detailed in each SSC-CPA
QA/QC procedures to be applied:	QA procedures will be detailed in each SSC- CPA DD
Any comment:	As described in Section E.4, this parameter only applies when if according to the assessment, the SSC-CPA is likely to result in an increase of physical leakage emissions due to refrigerant uses.

E.7.2. Description of the monitoring plan for a SSC-CPA:

Each SSC-CPA will have a detailed monitoring plan describing how they comply with monitoring requirements of the applied approved methodology (AMS II.E/Version 10) and this PoA. SSC-CPA monitoring plans will clearly describe the approach and technologies to be used to collect the following parameters *inter-alia*:

- baseline energy consumption;
- average annual quantity of refrigerant used in the baseline to replace refrigerant that has leaked;
- direct measurement and recording of energy use in within the project boundary;
- project emissions from physical leakage of refrigerant from the project equipment; and
- where the SCC-CPA involves the replacement of equipment, the process and documentation for an independent monitoring of scrapping of replaced equipment.

Where a SSC-CPA intends to use a representative sampling method this method must be compliant with EB 65 Annex 2 'Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities'. .

Each SSC-CPA implementer will use a record keeping system to capture and store required data. This record keeping system must be approved by the CME and maintain appropriate records documenting the following variables inter *alia*:

- Start and end dates of each monitoring period.
- List of physical geographic location of each measure installed.
- Number of pieces of equipment distributed.
- Date of supply.
- Specification of equipment replaced.
- Data on key parameters: baseline energy consumption; average annual quantity of refrigerant used in the baseline (in the case where SSC-CPA technologies impact on the quantity of refrigerant used, refer Section E); project activity energy use; and project emissions from physical leakage of refrigerant from the project equipment (in the case where SSC-CPA technologies impact on the quantity of refrigerant used, refer Section E).
- Unambiguous identification of the recipient of the equipment.
- Emission reductions attributable for each monitoring period.

E.8 Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity(ies)

30th September 2011
Geoff Sinclair
The Standard Bank of South Africa Limited

Bill O'Connor
Coolnrg International Pty Ltd

Annex 1

CONTACT INFORMATION ON COORDINATING/MANAGING ENTITY and PARTICIPANTS IN THE PROGRAMME of ACTIVITIES

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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

If Public Funding is accessed for any SSC-CPAs under this PoA, affirmation will be provided in the SSC-CPA DD from the CPA implementer that this funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligation of those parties.

Annex 3

BASELINE INFORMATION

Baseline Scenario

Section A.4.3 provides an extensive discussion of potential alternative baseline scenarios. The project proponents have argued that the most likely scenario in the absence of the PoA is the continuation of 'business-as-usual'. Under this scenario commercial refrigeration plant building owners/operators continue to utilise existing, lower efficiency plant.

As per paragraph 5 and 6 of the applied approved methodology (AMS. II.E./Version 10) the baseline emissions of each SSC-CPA consist of the energy baseline multiplied by an emission coefficient.

The energy baseline is the energy use of the existing equipment that is replaced/retro-fitted in the case of retrofits measures and of the facility that would otherwise be built in the case of a new facility.

The emission coefficient will be calculated applying the latest version of AMS I D.

The baseline emissions of each SSC-CPA will be measured by gathering data during the baseline audit of each refrigeration plant. SSC-CPAs will describe methodology and present appropriate data in the calculation of their baseline emissions.

SSC-CPA's will use the equation (1a) or 1(b) in E.4 to calculate the baseline emissions.

Additionality

Section A.4.3 provides extensive discussion of the additionality of the PoA, in particular the barriers that prevent the adoption of new energy efficiency refrigeration technologies. To demonstrate the additionality of a typical SSC-CPA, the SSC-CPA implementer and CME will provide a discussion of one or more of the barriers listed below, as per the guidance provided in the "Non-binding best practice examples to demonstrate additionality for SSC project activities" in Annex 34, EB35. SSC-CPAs able to demonstrate the presence of one or more barriers will be deemed additional. In summary, it is expected that SSC-CPAs will encounter one or more of the following barriers:

- *Investment barrier*: a financially more viable alternative to the project activity would have led to higher emissions.
- *Access-to-finance barrier:* the project activity could not access appropriate capital without consideration of the CDM revenues;
- *Technological barrier:* a less technologically advanced alternative to the project activity involves lower risks due to the performance uncertainty or low market share of the new technology adopted for the project activity and so would have led to higher emissions.
- *Barrier due to prevailing practice:* prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions;
- *Other barriers:* such as institutional barriers or limited information, managerial resources, organizational capacity, or capacity to absorb new technologies.

SSC-CPAs may choose to identify and discuss other barriers such as those listed above in order to demonstrate the additionality of the project activity.

Grid Emission Factor Calculation

Each SSC-CPA will apply the latest version of AMS I D to calculate the baseline Grid Emission Factor (GEF) calculating a combined margin, consisting of the combination of operating margin and build margin.

Calculations shall be based on data from an official source (where available) and made publicly available.

The SSC-CPA DD shall indicate the key steps (with equations) in calculating the GEF according to the procedures prescribed in the latest “Tool to calculate the Emission Factor for an electricity system”.

Annex 4

MONITORING INFORMATION

Each SSC-CPA will have a detailed monitoring plan describing how they comply with monitoring requirements of the applied approved methodology (AMS II.E/Version 10) and this PoA. SSC-CPA monitoring plans will clearly describe the approach and technologies to be used to collect required parameters (as detailed in Section A.4.4.2 and E.7.2).

Where a SSC-CPA intends to use a representative sampling method this method must be compliant with EB 65 Annex 2 Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities. .

Each SSC-CPA implementer will use a record keeping system to capture and store required data. This record keeping system must be approved by the CME and maintain appropriate records documenting the required variables (as detailed in Section A.4.4.2 and E.7.2).